

REMEDIAL ACTION WORK PLAN

June 10, 2014

Submitted for:

PS186 / Boys & Girls Club of Harlem
521 West 145th Street
New York, NY 10031
Block 2077, Lot 14
OER Project Number# 14EH-N421M
VCP Number: 14CVCP255M

Submitted to:

New York City Office of Environmental Remediation
100 Gold Street, 2nd Floor
New York, NY 10038

Prepared for:

BGCH Apartments, LLC
155 3rd Street
Brooklyn, New York 11231

Submitted by:

Impact Environmental Closures, Inc.
170 Keyland Court
Bohemia, NY 11716

IE Project Number:

6627-01-02-2000



JUNE 2014

REMEDIAL ACTION WORK PLAN

TABLE OF CONTENTS

TABLE OF CONTENTS i

FIGURES iii

LIST OF ACRONYMS iv

CERTIFICATION vi

EXECUTIVE SUMMARY vii

REMEDIAL ACTION WORK PLAN 1

1.0 SITE BACKGROUND 1

 1.1 Site Location and Current usage 1

 1.2 proposed Redevelopment Plan 2

 1.3 Description of Surrounding Property 2

 1.4 remedial investigation 4

2.0 REMEDIAL ACTION OBJECTIVES 7

 Soil 7

 groundwater 7

3.0 REMEDIAL Alternatives analysis 8

 3.1 THRESHOLD CRITERIA 9

 3.2. BALANCING CRITERIA 10

4.0 REMEDIAL ACTION 16

 4.1 Summary of Preferred Remedial Action 16

 4.2 Soil Cleanup Objectives and soil/Fill management 18

 4.3 engineering Controls 21

 4.4 Institutional Controls 22

4.5	Site Management plan.....	23
4.6	qualitative human health exposure assessment.....	23
5.0	REMEDIAL ACTION MANAGEMENT.....	27
5.1	Project Organization and oversight.....	27
5.2	Site Security.....	27
5.3	Work Hours.....	27
5.4	Construction Health and Safety Plan.....	27
5.5	Community Air Monitoring Plan.....	28
5.6	Agency Approvals.....	30
5.7	Site Preparation.....	30
5.8	Traffic Control.....	33
5.9	Demobilization.....	34
5.10	Reporting and Record Keeping.....	34
5.11	Complaint Management.....	35
5.12	Deviations from the Remedial Action Work Plan.....	36
5.13	Data usability sUmmary report.....	36
6.0	REMEDIAL ACTION REPORT.....	37
7.0	SCHEDULE.....	39

FIGURES

- Figure-1: Site Location Map
- Figure-2: Site Map
- Figure-3: Excavation and Composite Cover Location Plan

TABLES

- Table-1: Soil Sample Analysis Summary Table
- Table-2: Groundwater Sample Analysis Summary Table
- Table-3: Sub-Slab Soil Vapor, Indoor Air and Outdoor Air Sample Analysis Table

APPENDICES

- Appendix-A: Citizen Participation Plan
- Appendix-B: Sustainability Statement
- Appendix-C: Soil/Materials Management Plan
- Appendix-D: Construction Health and Safety Plan
- Appendix-E: Proposed Redevelopment Plans

LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
AS/SVE	Air Sparging/Soil Vapor Extraction
BOA	Brownfield Opportunity Area
CAMP	Community Air Monitoring Plan
C/D	Construction/Demolition
COC	Certificate of Completion
CQAP	Construction Quality Assurance Plan
CSOP	Contractors Site Operation Plan
ECs/ICs	Engineering and Institutional Controls
HASP	Health and Safety Plan
IRM	Interim Remedial Measure
BCA	Brownfield Cleanup Agreement
MNA	Monitored Natural Attenuation
NOC	Notice of Completion
NYC BCP	New York City Brownfield Cleanup Program
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York State Department of Health and Mental Hygiene
NYCRR	New York Codes Rules and Regulations
NYC OER	New York City Office of Environmental Remediation
NYS DEC	New York State Department of Environmental Conservation
NYS DEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYS DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
ORC	Oxygen-Release Compound
OSHA	United States Occupational Health and Safety Administration
PE	Professional Engineer
PID	Photo Ionization Detector
QEP	Qualified Environmental Professional
QHHEA	Qualitative Human Health Exposure Assessment
RAOs	Remedial Action Objectives
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan or Plan
RCA	Recycled Concrete Aggregate
RD	Remedial Design

RI	Remedial Investigation
RMZ	Residual Management Zone
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVOC	Semi-Volatile Organic Compound
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

CERTIFICATION

I, Joel Rogers, am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the redevelopment project located at 521 West 145th Street, New York, NY. VCP Project Number 14CVCP255M and OER number 14EH-N421M.

I certify that this Remedial Action Work Plan (RAWP) has a plan for handling, transport and disposal of soil, fill, fluids and other materials removed from the property in accordance with applicable City, State and Federal laws and regulations. Importation of all soil, fill and other material from off-Site will be in accordance with all applicable City, State and Federal laws and requirements. This RAWP has provisions to control nuisances during the remediation and all invasive work, including dust and odor suppression.

Joel Rogers

Name

083034

NYS

PE


Signature

6/10/14

Date



Number

Kevin Kleaka

QEP Name


QEP Signature

6/10/14

Date

EXECUTIVE SUMMARY

BGCH Apartments, LLC has applied to enroll in the New York City Voluntary Brownfield Cleanup Program (NYC VCP) to investigate and remediate a 29,985-square foot site located at 521 West 145th Street in New York, New York. A remedial investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP). The remedial action described in this document provides for the protection of public health and the environment consistent with the intended property use, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

Site Location and Current Usage

The Site is located in the West Harlem section of Manhattan, and is identified as Block 2077 and Lot 14 on the New York City Tax Map. This project has been assigned project number 14EH-N421M by the NYC Office of Environmental Remediation (OER). **Figure 1** shows the Site location. The Site is 0.68-acre (29,985-square feet), and is bound to the north by West 146th Street, and to the south by West 145th Street. A map of the Site boundary is shown in **Figure 2**. The Site is currently developed with an H-shaped, five-story building (formerly P.S. 186), reportedly constructed in 1901 and subsequently abandoned circa 1970. In addition, a partial sub-grade cellar is situated at the mid-section of the existing building. The surface area of the Site is predominantly covered by the current building footprint with other associated areas consisting of exposed concrete in the two adjacent court yards. The current zoning designation, as per Department of City Planning NYC zoning maps, is R8A and R7A, with a C2-4 commercial overlay.

Summary of Proposed Redevelopment Plan

The proposed use of the Site will be residential, which is consistent with the existing zoning for the property. The development project will entail full renovation of the existing building for use as the Boys and Girls Club of Harlem and new residences. The Project will be a mixed-use, mixed-income building, with 79 residential units serving very low-income, low-income, middle-income and market-rate households. A 10,000 SF community facility space on the ground floor will serve as the Boys and Girls Club of Harlem. The proposed development will include minor soil disturbance activities to a maximum depth of 6 feet below existing grade, including installation of two elevator pits (basement level), entrance/egress stairs, handicapped-accessible ramps, and planted areas within the north and south court yards. The groundwater table is expected to be 26.5-to-30.5 feet BEG at the Site therefore; soil excavation

is expected above the groundwater table. Excavation and removal of any existing surfaces, sub-grade utilities and drainage structures is proposed prior to redevelopment activities.

The remedial action contemplated under this RAWP may be implemented independently of the proposed redevelopment plan.

Summary of the Remedy

The proposed remedial action achieves protection of public health and the environment for the intended use of the property. The proposed remedial action achieves all of the remedial action objectives established for the project and addresses applicable standards, criterion, and guidance; is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants; is cost effective and implementable; and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan;
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds;
3. Establish Track 1 Soil Cleanup Objectives (SCOs);
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas;
5. Excavation and removal of soil/fill exceeding SCOs. For development purposes, excavation and removal of contaminated soil/fill will occur in the south courtyard (“SB-6”) that indicated elevated levels of arsenic exceeding SCOs during the RI. In addition, excavation and potential removal of soil will be required to install an elevator pit in the cellar. An approximate total of 800 cubic feet (~30 cubic yards) of soil is anticipated to be removed from the Site. An Excavation and Composite Cover Plan showing specific locations is included as Figure 3.
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site;
7. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if

- evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations;
8. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities;
 9. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
 10. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
 11. As part of development, construction and maintenance of an engineered composite cover consisting of concrete open space cover of 5-inches to prevent human exposure to residual soil/fill remaining under the Site;
 12. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations;
 13. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations. Based on the proposed development, excavations will be conducted above the water table and groundwater is not anticipated to be encountered. If groundwater is encountered then dewatering would be required during excavation. Site-wide dewatering will be completed in accordance with a New York City Department of Environmental Protection (NYCDEP) permit;
 14. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP, and, if Track 1 SCOs are not achieved, describes all Engineering and Institutional Controls to be implemented at the Site;
 15. If Track 1 SCOs are not achieved, submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency; and

16. If Track 1 SCOs are not achieved, the property will continue to be registered with an E-Designation by the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

Community Protection Statement

The Office of Environmental Remediation created the New York City Voluntary Cleanup Program (NYC VCP) to provide governmental oversight for the cleanup of contaminated property in NYC. This Remedial Action Work Plan (“cleanup plan”) describes the findings of prior environmental studies that show the location of contamination at the site, and describes the plans to clean up the site to protect public health and the environment.

This cleanup plan provides a very high level of protection for neighboring communities and also includes many other elements that address common community concerns, such as community air monitoring, odor, dust and noise controls, hours of operation, good housekeeping and cleanliness, truck management and routing, and opportunities for community participation. The purpose of this Community Protection Statement is to explain these community protection measures in non-technical language to simplify community review.

Remedial Investigation and Cleanup Plan. Under the NYC VCP, a thorough cleanup study of this property (called a “remedial investigation”) has been performed to identify past property usage, to sample and test soils, groundwater and soil vapor, and identify contaminant sources present on the property. The cleanup plan has been designed to address all contaminant sources that have been identified during the study of this property.

Identification of Sensitive Land Uses. Prior to selecting a cleanup, the neighborhood was evaluated to identify sensitive land uses nearby, such as schools, day care facilities, hospitals and residential areas. The cleanup program was then tailored to address the special conditions of this community.

Qualitative Human Health Exposure Assessment. An important part of the cleanup planning for the Site is the performance of a study to find all of the ways that people might come in contact with contaminants at the Site now or in the future. This study is called a Qualitative Human Health Exposure Assessment (QHHEA). A QHHEA was performed for this project. This assessment has considered all known contamination at the Site and evaluated the potential for people to come in contact with this contamination. All identified public exposures will be addressed under this cleanup plan.

Health and Safety Plan. This cleanup plan includes a Construction Health and Safety Plan (CHASP) that is designed to protect community residents and on-Site workers. The elements of this plan are in

compliance with safety requirements of the United States Occupational Safety and Health Administration (OSHA). This plan includes many protective elements including those discussed below.

Site Safety Coordinator. This project has a designated Site safety coordinator to implement the Health and Safety Plan. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The environmental Site safety coordinator is Greg Mendez-Chicas of Impact Environmental Closures, Inc., and can be reached at (631) 252-5480.

Worker Training. Workers participating in cleanup of contaminated material on this project are required to be trained in a 40-hour hazardous waste operators training course and to take annual refresher training. This pertains only to workers performing specific tasks including removing hazardous material and installing cleanup systems in contaminated areas.

Community Air Monitoring Plan. Community air monitoring will be performed during this cleanup project to ensure that the community is properly protected from contaminants, dust and odors. Air samples will be tested in accordance with a detailed plan called the Community Air Monitoring Plan (CAMP). Results will be regularly reported to the NYC OER. This cleanup plan also has a plan to address any unforeseen problems that might occur during the cleanup (called a 'Contingency Plan').

Odor, Dust and Noise Control. This cleanup plan includes actions for odor and dust control. These actions are designed to prevent off-Site odor and dust nuisances and includes steps to be taken if nuisances are detected. Generally, dust is managed by application of physical covers and by water sprays. Odors are controlled by limiting the area of open excavations, physical covers, spray foams and by a series of other actions (called operational measures). The project is also required to comply with NYC noise control standards. If you observe problems in these areas, please contact the onsite Project Manager Greg Mendez-Chicas at (631) 252-5480 or NYC Office of Environmental Remediation Project Manager Rebecca Bub at (212) 341-2073.

Quality Assurance. This cleanup plan requires that evidence be provided to illustrate that all cleanup work required under the plan has been completed properly. This evidence will be summarized in the final report, called the Remedial Action Report. This report will be submitted to the NYC Office of Environmental Remediation and will be thoroughly reviewed.

Storm-Water Management. To limit the potential for soil erosion and discharge, this cleanup plan has provisions for storm-water management. The main elements of the storm water management include physical barriers such as tarp covers and erosion fencing, and a program for frequent inspection.

Hours of Operation. The hours for operation of cleanup will comply with the NYC Department of Buildings construction code requirements or according to specific variances issued by that agency. For this cleanup project, the hours of operation are Monday through Friday, 7:00AM to 3:00 PM, or as otherwise allowed under approved New York City Department of Building Permit.

Signage. While the cleanup is in progress, a placard will be prominently posted at the main entrance of the property with a laminated project Fact Sheet that states that the project is in the NYC Voluntary Cleanup Program, provides project contact names and numbers, and locations of project documents can be viewed.

Complaint Management. The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager Greg Mendez-Chicas at (631) 252-5480, the NYC Office of Environmental Remediation Project Manager Rebecca Bub at (212) 341-2073, or call 311 and mention the Site is in the NYC Voluntary Cleanup Program.

Utility Mark-outs. To promote safety during excavation in this cleanup, the contractor is required to first identify all utilities and must perform all excavation and construction work in compliance with NYC Department of Buildings regulations.

Soil and Liquid Disposal. All soil and liquid material removed from the Site as part of the cleanup will be transported and disposed of in accordance with all applicable City, State and Federal regulations and required permits will be obtained.

Soil Chemical Testing and Screening. All excavations will be supervised by a trained and properly qualified environmental professional. In addition to extensive sampling and chemical testing of soils on the Site, excavated soil will be screened continuously using hand-held instruments, by sight, and by smell to ensure proper material handling and management, and community protection.

Stockpile Management. Soil stockpiles will be kept covered with tarps to prevent dust, odors and erosion. Stockpiles will be frequently inspected. Damaged tarp covers will be promptly replaced. Stockpiles will be protected with silt fences. Hay bales will be used, as needed to protect storm water catch basins and other discharge points.

Trucks and Covers. Loaded trucks leaving the Site will be covered in compliance with applicable laws and regulations to prevent dust and odor. Trucks will be properly recorded in logs and records and placarded in compliance with applicable City, State and Federal laws, including those of the New York

State Department of Transportation. If loads contain wet material that can leak, truck liners will be used. All transport of materials will be performed by licensed truckers and in compliance with all laws and regulations.

Imported Material. All fill materials proposed to be brought onto the Site will comply with rules outlined in this cleanup plan and will be inspected and approved by a qualified worker located on-Site. Waste materials will not be brought onto the Site. Trucks entering the Site with imported clean materials will be covered in compliance with applicable laws and regulations.

Equipment Decontamination. All equipment used for cleanup work will be inspected and washed, if needed, before it leaves the Site. Trucks will be cleaned at a truck inspection station on the property before leaving the Site.

Housekeeping. Locations where trucks enter or leave the Site will be inspected every day and cleaned regularly to ensure that they are free of dirt and other materials from the Site.

Truck Routing. Truck routes have been selected to: (a) limit transport through residential areas and past sensitive nearby properties; (b) maximize use of city-mapped truck routes; (c) limit total distance to major highways; (d) promote safety in entry to highways; (e) promote overall safety in trucking; and (f) minimize off-Site line-ups (queuing) of trucks entering the property. Operators of loaded trucks leaving the Site will be instructed not to stop or idle in the local neighborhood.

Final Report. The results of all cleanup work will be fully documented in a final report (called a Remedial Action Report) that will be available for you to review in the public document repositories located at New York Public Library – Hamilton Grange Library.

Long-Term Site Management. If long-term protection is required after the cleanup is complete, the property owner will be required to comply with an ongoing Site Management Plan (if Track 1 is not achieved) that calls for continued inspection of protective controls, such as Site covers. The Site Management Plan is evaluated and approved by the NYC OER. Requirements that the property owner must comply with are established through a city environmental designation. A certification of continued protectiveness of the cleanup will be required from time to time to show that the approved cleanup is still effective.

REMEDIAL ACTION WORK PLAN

1.0 SITE BACKGROUND

BGCH Apartments, LLC has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 521 West 145th Street in the West Harlem section of New York, New York (the “Site”). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. 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 LOCATION AND CURRENT USAGE

The Site is located in the West Harlem section of Manhattan, and is identified as Block 2077 and Lot 14 on the New York City Tax Map. This project has been assigned project number 14EH-N421M by the NYC Office of Environmental Remediation (OER). **Figure 1** shows the Site location. The Site is 0.68-acre (29,985-square feet), and is bound to the north by West 146th Street, and to the south by West 145th Street. A map of the Site boundary is shown in **Figure 2**. The Site is currently developed with an H-shaped, five-story building (formerly PS 186), reportedly constructed in 1901 and subsequently abandoned circa 1970. In addition, a partial sub-grade cellar is situated at the mid-section of the existing building. The surface area of the Site is predominantly covered by the current building footprint with other associated areas consisting of exposed concrete in the two adjacent court yards. The current zoning designation, as per Department of City Planning NYC zoning maps, is R8A and R7A, with a C2-4 commercial overlay.

1.2 PROPOSED REDEVELOPMENT PLAN

The proposed use of the Site will be residential, which is consistent with the existing zoning for the property. The development project will entail full renovation of the existing building for use as the Boys and Girls Club of Harlem and new residences. The Project will be a mixed-use, mixed-income building, with 79 residential units serving very low-income, low-income, middle-income and market-rate households. A 10,000 SF community facility space on the ground floor will serve as the Boys and Girls Club of Harlem. The proposed development will include minor soil disturbance activities to a maximum depth of 6 feet below existing grade, including installation of two elevator pits (basement level), entrance/egress stairs, handicapped-accessible ramps, and planted areas within the north and south court yards. The groundwater table is expected to be 26.5-to-30.5 feet BEG at the Site therefore; soil excavation is expected above the groundwater table. Excavation and removal of any existing surfaces, sub-grade utilities and drainage structures is proposed prior to redevelopment activities.

The remedial action contemplated under this RAWP may be implemented independently of the proposed redevelopment plan.

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The Site is located in the West Harlem neighborhood of New York. West Harlem is comprised of the neighborhoods including Hamilton Heights, Sugar Hill and a portion of Manhattanville. The neighborhoods are predominantly of low-to mid-rise residential, made up of five- and six-story apartment buildings, three- and four-story brownstones and rowhouses. Specifically, the Site lies between Broadway and Amsterdam Avenue, which primary consists of six-story mixed-use buildings, retail shopping, a hotel and a public library which are interspersed with a few under-developed structures. The West Harlem Rezoning proposal was issued in 2008 to preserve the established and varied character of the West Harlem residential neighborhoods, consider opportunities for new mixed-use development in the existing manufacturing district, located between West 126th and West 130th Streets, and explore the community's east-west corridors to allow for development opportunities, while utilizing the Inclusionary Housing Program to promote affordable housing. A description of each of the adjoining properties is described in the table below.

Direction	Property Description
<p>North Opposite Side of 146th Street</p>	<p><u>Block 2078 Lots 15, 17, and 19</u> (525 W. 146th St., 523 W. 146th St., and 1740 Amsterdam Ave.) – Three lots that front 146th Street. Lot 15 is currently developed with a multi-family walk-up building, zoned R7A with no commercial overlay. Lots 17 and 19 are currently developed with public facilities and institutions. The lots are currently zoned R7A, with a C1-4 commercial overlay on Lot 19.</p>
<p>South Opposite Side of 145th Street</p>	<p><u>Block 2076 Lots 49, 46, and 45</u> (524 W. 145th St., 520 W. 145th St., and 518 W. 145th St.) – Three lots that front 145th Street. The lots are currently developed with mixed-use residential and commercial buildings. The lots are currently zoned R8A, with a C2-4 commercial overlay.</p>
<p><u>West Adjacent Properties</u></p>	<p><u>Block 2077 Lot 50</u> (540 W. 146th St.) – A 7,433-SF lot that fronts 146th St. The lot is currently developed with multi-family elevator building. The lot is currently zoned R7A, with no commercial overlay.</p> <p>Block 2077 Lot 13 (529 W. 145 St.) – A 3,331-SF lot that fronts 145th St. The lot is currently developed with a mixed-use residential and commercial building. The lot is currently zoned R8A, with a C2-4 commercial overlay.</p>
<p>East Adjacent Properties</p>	<p>Block 2077 Lot 43 (522 W. 146th St.) – A 3,997-SF lot that fronts 146th St. The lot is currently vacant land. The lot is currently zoned R7A, with no commercial overlay.</p> <p>Block 2077 Lot 20 (515 W. 145th St.) – A 3,327-SF lot that fronts 145th St. The lot is currently developed with a commercial building, zoned R8A, with a C2-4 commercial overlay.</p>

There is one school, identified as P.S. 153, located within a 250-ft radius of the Site. There are no other sensitive receptors such as hospitals or day care facilities within a 250-ft radius of the Site. One day healthcare facility is located within a 500-ft radius of the Site; Upper Manhattan Mental Health Center, located at 1727 Amsterdam Avenue. There no hospitals or schools located within a 500-ft radius of the Site.

1.4 REMEDIAL INVESTIGATION

A remedial investigation was performed and the results are documented in a companion document called “*Remedial Investigation Report, 521 West 145th Street, New York, NY*”, dated May 28, 2014 (RIR).

Summary of Past Uses of Site and Areas of Concern

The Site was formerly utilized as a public school, P.S.186, dating back to 1902. A Phase I Environmental Site Assessment (ESA) Report, dated March 28, 2014 was prepared by Impact Environmental Closures, Inc. (Impact Environmental). The ESA revealed that the historical Sanborn maps depict the Site as developed with an H-shaped building (consistent with the Site’s current configuration) from 1909 to 2005. The Phase I ESA revealed evidence of recognized environmental conditions (RECs) in connection with the Site.

The AOCs identified for this site include:

- The Site has been assigned a special environmental “E” designation (E-284) under the CEQR process (CEQR No. 12DCP070M) as part of rezoning, effective as of November 13, 2012. E-designation requires specific protocols that must be followed. The information reviewed indicated “*Hazardous Materials Phase I and Phase II Testing Protocol, Window Wall Attenuation & Alternate Ventilation*”; and,
- The basement storage room contains intact, broken, capped, and uncapped bottles filled with liquids, pills, powders and sludge. The bottles are located on both the shelves and the floor, many of which are obscured by a thick coating of debris. Most of the labels are no longer legible. However, bottles of acid, sodium bicarbonate, bleach powder, and antibiotics were identified. These items represent the potential for subsurface contamination if the concrete slab floor contains cracks or gaps.
- Presence of historic fill up to 4 feet below grade

Summary of the Work Performed under the Remedial Investigation

Impact Environmental on behalf of BGCH Apartments, LLC, performed the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed 7 soil borings (SB-1 through SB-7) across the entire project Site, and collected 8 soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Collected 1 groundwater samples for chemical analysis to evaluate groundwater quality from a temporary groundwater well point (GW-1);
4. Installed 5 semi-permanent sub-slab soil vapor probes throughout the interior On-site building interior (SV-1 through SV-5), and collected 5 samples for chemical analysis. In addition, 2 indoor air samples and one ambient (outdoor) background air sample were collected concurrently with the sub-slab vapor samples.
5. Prepared RIR based on investigation results.

Summary of Environmental Findings

1. The topographic elevation of the property is approximately 123 feet above mean sea level.
2. Groundwater was present at approximately 28 feet below grade surface (bgs).
3. Based upon the topographic map (USGS – Central Park New York – New Jersey Quadrangle - 1995), and the proximity of the Hudson River, regional groundwater flow direction in the area of the Site is presumed to be towards the west-northwest.
4. Subsurface soil at the Site included a surficial fill layer consisting of concrete, brick, and trace coal in a brown to dark-brown medium sand matrix ranging in thickness from 0-to-4 feet bgs in the north and south courtyard. This fill layer is underlain by brown fine-to-medium sand with some silts and trace gravel extending from 4-to-30 feet bgs, in which a thin clay confining layer exists at 12-to-14 feet bgs. Weathered bedrock (schist) was encountered at depths ranging from 26-to-30 feet bgs in the north courtyard of the Site. No visible or olfactory evidence of petroleum, or other chemicals, was observed in soil recovered from borings installed across the Site. Depth to bedrock varied between 24.5-to-30.5 feet bgs in the north courtyard of the Site during this RI.
5. Soil investigation results were compared to NYSDEC Unrestricted Use (Track 1) and Restricted Residential Use (Track 2) Soil Cleanup Objectives (SCOs) as presented in NYSDC Part 375.6

and CP-51. Soil/fill samples detected no PCBs. one VOC, acetone, was detected at trace levels in two samples, but did not exceed Unrestricted Use SCOs. Several SVOCs were detected in three of the eight soil samples, but none of the detections exceeded Unrestricted Use SCOs. One pesticide, 4,4-DDT, was detected below its Unrestricted Use SCO. One metal, Arsenic, was detected above its Restricted Residential Use SCO at a concentration of 24 mg/kg in one shallow soil sample. All other metals detected in soil samples were at concentrations below Unrestricted Use SCOs. Overall, soil chemistry is unremarkable and does not indicate any disposal at this property.

6. Groundwater samples were compared to New York State 6NYCRR Part 703.5 Class GA Groundwater Quality Standards (GQS). The groundwater sample showed that PCBs and Pesticides were not detected. No SVOCs or metals were detected in the groundwater exceeding GQS. One VOC, cis-1,2-dichloroethene (7.2 µg/l) was detected in the groundwater sample above GQS. TCE, tert-Butylbenzene, and 1,2-Dichloroethane were identified in the groundwater sample at low concentrations and below GQS.
7. Sub slab soil vapor samples collected during the RI were compared to New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion Air Guideline Values, Table 3.1, and Soil Vapor Intrusion Decision Matrices. All sub-slab soil vapor samples showed numerous VOCs detected at low concentrations below the NYSDOH air guideline values. All detected concentrations were less than 5 µg/m³. These results indicate that none of the compounds detected in vapors require further action, according to the NYS DOH Final Guidance on Soil Vapor Intrusion (October 2006). While no chlorinated compounds were detected in sub-slab soil vapor, low-level detection of PCE and carbon tetrachloride were present in indoor and outdoor air samples ranging from 0.428 to 0.491 µg/m³.

2.0 REMEDIAL ACTION OBJECTIVES

Based on the results of the RI, the following Remedial Action Objectives (RAOs) have been identified for this Site:

SOIL

- Prevent direct contact with contaminated soil.
- Prevent migration of contaminants that would result in groundwater or surface water contamination.

GROUNDWATER

- Prevent direct exposure to groundwater.
- Prevent exposure to contaminants volatilizing from groundwater.

SOIL VAPOR

- Prevent exposure to contaminants in soil vapor.
- Prevent migration of soil vapor into dwelling and other occupied structures.

3.0 REMEDIAL ALTERNATIVES ANALYSIS

The goal of the remedy selection process is to select a remedy that is protective of human health and the environment taking into consideration the current, intended and reasonably anticipated future use of the property. The remedy selection process begins by establishing RAOs for media in which chemical constituents were found in exceedance of applicable standards, criteria and guidance values (SCGs). A remedy is then developed based on the following ten criteria:

- Protection of human health and the environment;
- Compliance with SCGs;
- Short-term effectiveness and impacts;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume of contaminated material;
- Implementability;
- Cost effectiveness;
- Community Acceptance;
- Land use; and
- Sustainability.

The following is a detailed description of the alternatives analysis and remedy selection to address impacted media at the Site. As required, a minimum of two remedial alternatives (including a Track 1 scenario) are evaluated, as follows:

Alternative 1:

1. Establishment of Unrestricted Use (Track1) Soil Cleanup Objectives (SCOs);
3. 2. Excavation and removal of all soil/fill exceeding Track 1 SCOs at specific locations throughout the Site and confirmation that Track 1 SCOs have been achieved with post-excavation endpoint sampling. Based on the results of the remedial investigation, it is expected that this alternative would require excavation to at least 4 feet BEG within the south courtyard on the Site. However, if soil/fill containing chemical constituents at concentrations above Track 1 SCOs are

still present at the base of the excavation after the removal of all soil required for new construction, additional excavation would be performed to ensure complete removal of soil that does not meet Track 1 Unrestricted Use SCOs; Placement of a final cover consisting of 5 inch concrete building slab and either a minimum of two feet of clean fill or concrete cover in the recreational outdoor area over the entire Site as part of new development; and

Alternative 2:

1. Establishment of Site Specific (Track 4) SCOs;
2. Excavation and removal of all soil/fill exceeding Track 4 SCOs and confirmation that Track 4 has been achieved with post-excavation end-point sampling;
3. Placement of a final cover consisting of a concrete cellar slab and either a minimum of two feet of clean fill or concrete cover in the recreational outdoor area over the entire Site as part of new development;
4. Establishment of use restrictions including prohibitions on the use of groundwater from the site; prohibitions on other sensitive site uses, such as farming or vegetable gardening, to prevent future exposure pathways; and prohibition of a higher level of land use without OER approval;
5. Establishment of an approved Site Management Plan to ensure long-term management of the above Engineering and Institutional Controls including the performance of periodic inspections and certification that the Controls are performing as they were intended; and
6. Continued registration as an E-designated property to memorialize the remedial action and the Engineering and Institutional Controls required by this RAWP

3.1 THRESHOLD CRITERIA

Protection of Public Health and the Environment

This criterion is an evaluation of the remedy's ability to protect public health and the environment, and an assessment of how risks posed through each existing or potential pathway of exposure are eliminated, reduced or controlled through removal, treatment, and implementation of Engineering Controls or

Institutional Controls. Protection of public health and the environment must be achieved for all approved remedial actions.

Alternative 1 would be protective of human health and the environment by removing contaminated soil/fill exceeding Track 1 SCOs and groundwater protection standards, thus eliminating potential for direct contact with contaminated soil/fill once construction is complete and eliminating the risk of contamination leaching into groundwater.

Alternative 2 would achieve comparable protections of human health and the environment by excavating the historic fill and by ensuring that remaining soil/fill on-Site meets Track 4 Site Specific SCOs, as well as by placement of Institutional and Engineering controls, including a composite cover system. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. Implementing Institutional Controls including a Site Management Plan and continued registration as an E-designation property would ensure that the composite cover system remains intact and protective.

For both alternatives, potential exposure to contaminated soils during construction would be minimized by implementing an approved Construction Health and Safety Plan, Soil/Materials Management Plan and Community Air Monitoring Plan (CAMP). Potential contact with contaminated groundwater would be prevented as its use is prohibited by city laws and regulations. Potential contact with contaminated groundwater is not likely and is not anticipated to be encountered during construction.

3.2. BALANCING CRITERIA

Compliance with Standards, Criteria and Guidance (SCGs)

This evaluation criterion assesses the ability of the alternative to achieve applicable standards, criteria and guidance.

Alternative 1 would achieve compliance with the remedial goals, chemical specific SCGs and RAOs for soil through removal of soil to achieve Track 1 SCOs and groundwater protection standards. There were no VOCs detected above applicable regulatory guidelines in sub-slab soil vapor or indoor air samples collected during the RI.

Alternative 2 would achieve compliance with the remedial goals, SCGs and RAOs for soil through removal of soil to meet Track 4 Site Specific SCOs. A Site Management Plan would ensure that these controls remained protective for the long term.

For both alternatives, focused attention on means and methods employed during the remedial action would ensure that handling and management of contaminated material would be in compliance with applicable SCGs. Health and safety measures contained in the CHASP and Community Air Monitoring Plan (CAMP) that comply with the applicable SCGs shall be implemented during Site redevelopment under this RAWP. These measures will protect on-Site workers and the surrounding community from exposure to Site-related contaminants.

Short-term effectiveness and impacts

This evaluation criterion assesses the effects of the alternative during the construction and implementation phase until remedial action objectives are met. Under this criterion, alternatives are evaluated with respect to their effects on public health and the environment during implementation of the remedial action, including protection of the community, environmental impacts, time until remedial response objectives are achieved, and protection of workers during remedial actions. Both alternatives have similar-short term impacts during their respective implementations, as each requires excavation of historic fill material. Both alternatives would result in short-term dust generation associated with excavation, handling, and load out of materials. Short term impacts would be slightly higher for Alternative 1 due to excavation of greater amounts of historical fill material. Both alternatives would employ appropriate measures to prevent short term impacts, including a Construction Health and Safety Plan, a Community Air Monitoring Plan (CAMP) and a Soil/Materials Management Plan (SMMP), during all on-Site soil disturbance activities and would minimize the release of contaminants into the environment. Both alternatives provide short term effectiveness in protecting the surrounding community by decreasing the risk of contact with on-Site contaminants. Construction workers operating under appropriate management procedures and a Health and Safety Plan (CHASP) will be protected from on-Site contaminants (personal protective equipment would be worn consistent with the documented and encountered risks within the respective work zones).

An additional short-term adverse impact associated with both remedial alternatives is increased truck traffic. Truck traffic would be marginally higher with Alternative 1. Truck traffic will be routed on the

most direct course using major thoroughfares where possible and flaggers will be used to protect pedestrians at Site entrances and exits.

Long-term effectiveness and permanence

This evaluation criterion addresses the results of a remedial action in terms of its permanence and quantity/nature of waste or residual contamination remaining at the Site after response objectives have been met, such as permanence of the remedial alternative, magnitude of remaining contamination, adequacy of controls including the adequacy and suitability of ECs/ICs that may be used to manage contaminant residuals that remain at the Site and assessment of containment systems and ICs that are designed to eliminate exposures to contaminants, and long-term reliability of Engineering Controls.

Alternative 1 would achieve long-term effectiveness and permanence related to on-Site contamination by permanently removing all impacted soil/fill and enabling unrestricted usage of the property.

Alternative 2 would provide long-term effectiveness by removing most on-Site contamination and attaining Track 4 Site Specific SCOs, establishing Engineering Controls including a composite cover system across the Site; establishing Institutional Controls to ensure long-term management including use restrictions, a Site Management Plan and continuation of the E-designation to memorialize these controls for the long term. The SMP will ensure long-term effectiveness of all ECs and ICs by requiring periodic inspection and certification that these controls and restrictions continue to be in place and are functioning as they were intended assuring that protections designed into the remedy will provide continued high level of protection in perpetuity.

Both alternatives would result in removal of soil contamination exceeding the SCOs providing a high level, effective, and permanent remedy over the long-term and would address contaminated soil and eliminate or minimize any leaching to groundwater. Potential sources of soil vapor and groundwater contamination will also be eliminated as part of the Track 1 remedy.

Reduction of toxicity, mobility, or volume of contaminated material

This evaluation criterion assesses the remedial alternative's use of remedial technologies that permanently and significantly reduce toxicity, mobility, or volume of contaminants as their principal element. The following is the hierarchy of source removal and control measures that are to be used to remediate a Site,

ranked from most preferable to least preferable: removal and/or treatment, containment, elimination of exposure and treatment of source at the point of exposure. It is preferred to use treatment or removal to eliminate contaminants at a Site, reduce the total mass of toxic contaminants, cause irreversible reduction in contaminants mobility, or reduce of total volume of contaminated media.

Alternative 1 would permanently eliminate the toxicity, mobility, and volume of contaminants from on-Site soil by removing all soil in excess of Track 1 SCOs.

Alternative 2 would remove most of the impacted soil present on the Site and remaining soil beneath the composite cover would meet Track 4 Site Specific SCOs. Alternative 1 would eliminate a greater total mass of contaminants on Site.

Implementability

This evaluation criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of various services and materials required during its implementation, including technical feasibility of construction and operation, reliability of the selected technology, ease of undertaking remedial action, monitoring considerations, administrative feasibility (e.g. obtaining permits for remedial activities), and availability of services and materials.

The techniques, materials and equipment to implement Alternatives 1 and 2 are readily available and have been proven effective in remediating the contaminants associated with the Site. They use standard materials and services that are well established. The reliability of both alternatives is high. There are no special difficulties associated with any of the activities proposed in either case.

Cost effectiveness

This evaluation criterion addresses the cost of alternatives, including capital costs (such as construction costs, equipment costs, and disposal costs, engineering expenses) and site management costs (costs incurred after remedial construction is complete) necessary to ensure the continued effectiveness of a remedial action.

The costs associated with both Alternative 1 and Alternative 2 will likely be the comparable. Costs associated with Alternative 1 could potentially be higher than Alternative 2 due to the excavation and

disposal of at least 3 additional feet of soil and import and placement of certified clean fill to re-establish sub-grade elevation for the construction of the foundation structure. However, long-term costs for Alternative 2 are likely higher than Alternative 1 based on implementation of a Site Management Plan as part of Alternative 2.

Community Acceptance

This evaluation criterion addresses community opinion and support for the remedial action. Observations here will be supplemented by public comment received on the RAWP.

Based on the overall goals of the remedial program and initial permitting associated with the proposed site development, no adverse community opinion is anticipated for either alternative. Both remedial actions provide for protection of public health and the environment and minimize potential contaminant exposures. This RAWP will be subject to a public review under the NYC VCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedy. This public comment will be considered by OER prior to approval of this plan. The Citizen Participation Plan for the project is provided in **Appendix A**.

Land use

This evaluation criterion addresses the proposed use of the property. This evaluation has considered reasonably anticipated future uses of the Site and takes into account: current use and historical and/or recent development patterns; applicable zoning laws and maps; NYS Department of State's Brownfield Opportunity Areas (BOA) pursuant to section 970-r of the general municipal law; applicable land use plans; proximity to real property currently used for residential use, and to commercial, industrial, agricultural, and/or recreational areas; environmental justice impacts, Federal or State land use designations; population growth patterns and projections; accessibility to existing infrastructure; proximity of the site to important cultural resources and natural resources, potential vulnerability of groundwater to contamination that might emanate from the site, proximity to flood plains, geography and geology; and current Institutional Controls applicable to the site.

The proposed redevelopment of the Site is compatible with its current zoning and is consistent with recent development patterns. Following remediation, the Site will meet either Track 1 SCOs or Track 4 SCOs,

which are appropriate for its planned mixed residential-commercial use. Improvements in the current brownfield condition of the property achieved by both alternatives are also consistent with the City's goals for cleanup of contaminated land, making them safer and bringing such properties into productive reuse. Both alternatives are equally protective of natural resources and cultural resources.

Sustainability of the Remedial Action

This criterion evaluates the overall sustainability of the remedial action alternatives and the degree to which sustainable means are employed to implement the remedial action including those that take into consideration NYC's sustainability goals defined in *PlaNYC: A Greener, Greater New York*. Sustainability goals may include: maximizing the recycling and reuse of non-virgin materials; reducing the consumption of virgin and non-renewable resources; minimizing energy consumption and greenhouse gas emissions; improving energy efficiency; and promotion of the use of native vegetation and enhancing biodiversity during landscaping associated with Site development.

The remedial plan would take into consideration the shortest trucking routes during off-Site disposal of historic fill and other soils, which would reduce greenhouse gas emissions and conserve energy used to fuel trucks. To the extent practicable, energy efficient building materials, appliances, and equipment will be utilized to complete the development. Alternative 2 would result in a slightly lower energy usage based on reducing the volume of material transported off-Site. Both remedial alternatives are comparable with respect to the opportunity to achieve sustainable remedial action. A complete list of green remedial activities considered as part of the NYC VCP is included in the Sustainability Statement, included as **Appendix B**.

4.0 REMEDIAL ACTION

4.1 SUMMARY OF PREFERRED REMEDIAL ACTION

The preferred remedial action alternative is Alternative 1, the Track 1 Alternative. The preferred remedial action alternative achieves protection of public health and the environment for the intended use of the property. The preferred remedial action alternative will achieve all of the remedial action objectives established for the project and addresses applicable SCGs. The preferred remedial action alternative is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants. The preferred remedial action alternative is cost effective and implementable and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan;
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds;
3. Establish 6 NYCRR Part 703.5 Table 6.8 Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs);
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas;
5. Excavation and removal of soil/fill exceeding SCOs. For development purposes, excavation and removal of contaminated soil/fill will occur in the south courtyard (“SB-6”) that indicated elevated levels of arsenic exceeding SCOs during the RI. In addition, excavation and potential removal of soil will be required to install an elevator pit in the cellar. An approximate total of 800 cubic feet (~30 cubic yards) of soil is anticipated to be removed from the Site. An Excavation and Composite Cover Plan showing specific locations is included as Figure 3.
6. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site;

7. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations;
8. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities;
9. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
10. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
11. As part of development, construction and maintenance of an engineered composite cover consisting of concrete open space cover of 5-inches to prevent human exposure to residual soil/fill remaining under the Site;
12. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations;
13. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations. Based on the proposed development, excavations will be conducted above the water table and groundwater is not anticipated to be encountered. If groundwater is encountered then dewatering would be required during excavation. Site-wide dewatering will be completed in accordance with a New York City Department of Environmental Protection (NYCDEP) permit;
14. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP, and, if Track 1 SCOs are not achieved, describes all Engineering and Institutional Controls to be implemented at the Site;
15. If Track 1 SCOs are not achieved, submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation,

maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency; and

16. If Track 1 SCOs are not achieved, the property will continue to be registered with an E-Designation by the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

4.2 SOIL CLEANUP OBJECTIVES AND SOIL/FILL MANAGEMENT

Track 1 Soil Cleanup Objectives (SCOs) are proposed for this project. If Track 1 SCOs are not achieved then the SCOs for this Site are 6NYCRR Part 703.5 Table 6.8 (b) Restricted Residential as amended by following Site Specific SCOs:

<u>Contaminant</u>	<u>Track 4 SCOs</u>
<u>Arsenic</u>	<u>20 ppm</u>

Soil and materials management on-Site and off-Site, including excavation, handling and disposal, will be conducted in accordance with the Soil/Materials Management Plan in **Appendix C**. The location of planned excavations is shown in Figure 3.

Discrete contaminant sources (such as hotspots) identified during the remedial action will be identified by GPS or surveyed. This information will be provided in the Remedial Action Report.

Estimated Soil/Fill Removal Quantities

The total quantity of soil/fill expected to be excavated and disposed off-Site is estimated to be approximately 30 bank (in place) cubic yards. Disposal facilities will be reported to OER when they are identified and prior to the start of remedial action.

End-Point Sampling

Removal actions for development purposes under this plan will be performed in conjunction with confirmation soil sampling. Five (5) confirmation samples will be collected from the base of the

excavation at locations determined by OER. To evaluate attainment of Track 1 SCOs at the hot-spot (“SB-6”) within the south courtyard, analytes will include metals (arsenic) according to analytical methods described below.

Hot-spot removal actions, whether established under this RAWP or identified during the remedial program, will be performed in conjunction with post remedial end-point samples to ensure that hot-spots are fully removed. Analytes for end-point sampling will be those parameters that are driving the hot-spot removal action and will be approved by OER. Frequency for hot-spot end-point sample collection is as follows:

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.
2. For excavations 20 to 300 feet in perimeter:
 - For surface removals, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
 - For subsurface removals, one sample from each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
3. For sampling of volatile organics, bottom samples should be taken within 24 hours of excavation, and should be taken from the zero to six-inch interval at the excavation floor. Samples taken after 24 hours should be taken at six to twelve inches.
4. For contaminated soil removal, post remediation soil samples for laboratory analysis should be taken immediately after contaminated soil removal. If the excavation is enlarged horizontally, additional soil samples will be taken pursuant to bullets 1-3 above.

Post-remediation end-point sample locations and depth will be biased towards the areas and depths of highest contamination identified during previous sampling episodes unless field indicators such as field instrument measurements or visual contamination identified during the remedial action indicate that other locations and depths may be more heavily contaminated. In all cases, post-remediation samples should be biased toward locations and depths of the highest expected contamination.

New York State ELAP certified labs will be used for all confirmation and end-point sample analyses. Labs performing confirmation and end-point sample analyses will be reported in the RAR. The RAR will provide a tabular and map summary of all confirmation and end-point sample results and will include all data including non-detects and applicable standards and/or guidance values. End-point samples will be Confirmation samples will be analyzed for compounds and elements as described above utilizing the following methodology:

Soil analytical methods will include:

- Volatile organic compounds by EPA Method 8260;
- Semi-volatile organic compounds by EPA Method 8270;
- Target Analyte List metals; and
- Pesticides/PCBs by EPA Method 8081/8082.

If either LNAPL and/or DNAPL are detected, appropriate samples will be collected for characterization and “finger print analysis” and required regulatory reporting (i.e. spills hotline) will be performed.

Quality Assurance/Quality Control

QA/QC procedures will be used to provide performance information with regard to accuracy, precision, sensitivity, representation, completeness, and comparability associated with the sampling and analysis for documentation and soil sampling. Sampling equipment will be decontaminated by wiping clean, washing with Alconox solution, rinsing with deionized water and air drying prior to each use in order to ensure that cross-contamination between sampling locations does not occur. Decontamination procedures will be performed in an area segregated from any sampling areas. Each sample will be collected in pre-cleaned, laboratory supplied glassware, appropriately labeled, stored in a cooler with ice and submitted for analysis under proper chain of custody procedures to Alpha Analytical Laboratories (Alpha) of Westborough, MA, a New York State ELAP certified environmental laboratory (ELAP Certification No. 11148). Dedicated disposable sampling material will be used for the collection of endpoint samples, eliminating the need to prepare field equipment (rinsate) blanks. However, if non-disposable equipment is used, (stainless steel scoop, etc.), field rinsate blanks will be prepared at the rate of 1 for every eight samples collected. Decontamination of non-disposable sampling equipment will consist of the following:

- Gently tap or scrape to remove adhered soil
- Rinse with tap water
- Wash with Alconox® detergent solution and scrub
- Rinse with tap water

- Rinse with distilled or deionized water

Field blanks will be prepared by pouring distilled or deionized water over decontaminated equipment and collecting the water in laboratory provided containers. Trip blanks will be used whenever samples are transported to the laboratory for analysis of VOCs. Trips blanks will not be used for samples to be analyzed for metals, SVOCs or pesticides. One blind duplicate sample will be prepared and submitted for analysis every 20 samples.

Import of soils onto the property and reuse of soils already onsite will be performed in conformance with the Soil/Materials Management Plan in **Appendix C**. The estimated quantity of soil to be imported into the Site for backfill and cover soil is to be determined. Onsite soil/fill is not expected to be reused or relocated on Site.

4.3 ENGINEERING CONTROLS

The excavation required for the proposed Site development will achieve Track 1 Unrestricted Use SCOs. No Engineering Controls are required to address residual contamination at the Site. However, the following elements will be incorporated into the foundation design as part of the development: composite cover system. If Track 1 is not achieved, this element will constitute Engineering Controls that will be employed in the remedial action to address residual contamination remaining at the Site.

Composite Cover System

Exposure to residual soil/fill will be prevented by an engineered, composite cover system to be built on the Site. This composite cover system is comprised of:

As part of new development, the exterior north and south courtyard areas of the property will be covered by an engineered permanent cover system comprised of 5-inch thick concrete pavement. Landscaped planting areas proposed for the north courtyard will be covered with 2 feet of clean soil.

Under Alternative 2, the composite cover system would serve as a permanent engineering control for the Site. The system will be inspected and reported at specified intervals as required by this RAWP and the SMP. A Soil Management Plan will be included in the Site Management Plan and will outline the procedures to be followed in the event that the composite cover system and underlying residual soil/fill is disturbed after the remedial action is complete. Maintenance of this composite cover system will be described in the Site Management Plan in the RAR.

4.4 INSTITUTIONAL CONTROLS

Track 1 remedial actions do not require Engineering Controls. If Track 1 SCOs are not achieved, Institutional Controls (IC) will be utilized in this remedial action to manage residual soil/fill and other media and render the Site protective of public health and the environment. Institutional Controls are listed below. Long-term employment of EC/ICs will be implemented under a site-specific Site Management Plan (SMP) that will be included in the RAR.

Institutional Controls for this remedial action are:

- The property will continue to be registered with an E-Designation at the NYC Buildings Department. This RAWP includes a description of all ECs and ICs and summarizes the requirements of the Site Management Plan which will note that the property owner and property owner's successors and assigns must comply with the approved SMP;
- Submittal of a Site Management Plan in the RAR for approval by OER that provides procedures for appropriate operation, maintenance, monitoring, inspection, reporting and certification of ECs. SMP will require that the property owner and property owner's successors and assigns will submit to OER a periodic written statement that certifies that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by OER; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. OER retains the right to enter the Site in order to evaluate the continued maintenance of any controls. This certification shall be submitted annually and will comply with RCNY §43-1407(1)(3).
- Vegetable gardens and farming on the Site are prohibited in contact with residual soil materials;
- Use of groundwater underlying the Site is prohibited without treatment rendering it safe for its intended use;
- All future activities on the Site that will disturb residual material must be conducted pursuant to the soil management provisions in an approved SMP;
- The Site will be used for residential use and will not be used for a higher level of use without prior approval by OER.

4.5 SITE MANAGEMENT PLAN

Site Management is not required for Track 1 remedial actions. However, if Track 1 SCOs are not achieved, Site Management will be the last phase of remediation and begins with the approval of the Remedial Action Report and issuance of the Notice of Completion (NOC) for the Remedial Action. The Site Management Plan (SMP) describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by this RAWP. The Site Management Plan is submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER. The property owner is responsible to ensure that all Site Management responsibilities defined in the Site Management Plan are implemented.

The SMP will provide a detailed description of the procedures required to manage residual soil/fill left in place following completion of the remedial action in accordance with the Brownfield Cleanup Agreement with OER. This includes a plan for: (1) implementation of EC's and ICs; (2) implementation of monitoring programs; (3) operation and maintenance of EC's; (4) inspection and certification of EC's; and (5) reporting.

Site management activities, reporting, and EC/IC certification will be scheduled by OER on a periodic basis to be established in the SMP and will be subject to review and modification by OER. The Site Management Plan will be based on a calendar year and certification reports will be due for submission to OER by March 31 of the year following the reporting period.

4.6 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

The objective of the qualitative exposure assessment is to identify potential receptors and pathways for human exposure to the contaminants of concern (COC) that are present at, or migrating from, the Site. The identification of exposure pathways describes the route that the COC takes to travel from the source to the receptor. An identified pathway indicates that the potential for exposure exists; it does not imply that exposures actually occur.

Investigations reported in the Remedial Investigation Report (RIR) are sufficient to complete a Qualitative Human Health Exposure Assessment (QHHEA). As part of the VCP process, a QHHEA was performed to determine whether the Site poses an existing or future health hazard to the Site's exposed or potentially exposed population. The sampling data from the RI were evaluated to determine whether there

is any health risk by characterizing the exposure setting, identifying exposure pathways, and evaluating contaminant fate and transport. This QHHEA was prepared in accordance with Appendix 3B and Section 3.3 (b) 8 of the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation.

Known and Potential Sources

Historic fill material is present at the Site from grade to approximately 4 feet below grade. Based on the results of the Remedial Investigation Report, the contaminants of concern found are:

Soil

- Arsenic was detected above its Track 2 Restricted Residential SCOs.

Groundwater

- The VOC cis-1,2-Dichloroethene (7.2 µg/L) was detected above GQS.

Nature, Extent, Fate and Transport of Contaminants

No VOCs, SVOCs, PCB's or pesticides exceeded their respective SCOs. Furthermore, soil/fill and sub-slab soil vapor samples showed no detectable concentrations of VOC's in any of the eight (8) soil samples. Only arsenic is present in the shallow soil layer located in the south courtyard. However, arsenic found in soil was not detected in groundwater samples at concentrations above its respective AWQSSs, indicating that this contaminant is not mobilizing into groundwater or migrating off-Site. Additionally, cis-1,2-dichloroethene was detected in groundwater at a concentration slightly above its respective AWQSSs, albeit not detected in soil or sub-slab soil vapor samples. As previously noted, the groundwater table is located at approximately 28 feet BEG, and not anticipated to be encountered as part of the Site redevelopment. Sub-slab soil vapor sample results showed no detectable concentrations of VOCs above the NYSDOH Air Guideline Values or Matrices for soil vapor intrusion.

Potential Routes of Exposure

An exposure pathway is the means by which an individual may come into contact with a Site-derived contaminant. The five elements of an exposure pathway are: 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. An exposure pathway is considered complete when all five elements of an

exposure pathway are documented. A potential exposure pathway exists when any one or more of the five elements comprising an exposure pathway cannot be documented. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway has not existed in the past, does not exist in the present, and will never exist in the future. Three potential primary routes exist by which chemicals can enter the body:

- Ingestion of water, fill, or soil;
- Inhalation of vapors and particulates; and
- Dermal contact with water, fill, soil, or building materials.

Existence of Human Health Exposure

Current Conditions: The Site is currently occupied by a five-story vacant building. The surface area of the Site consists of concrete slabs and concrete sidewalks, thus limiting potential contact with on-Site soil.

Groundwater is not exposed at the Site, and because the Site is served by the public water supply and groundwater use for potable supply is prohibited, groundwater is not used at the Site. As the Site is currently capped, accumulation of soil vapor can pose an exposure threat; however, sub-slab soil vapor results indicated levels well below regulatory guidelines.

Construction/ Remediation Activities: Once redevelopment activities begin, construction workers will come into direct contact with surface and subsurface soils, as a result of on-Site construction and excavation activities. Due to the planned shallow excavation depth, exposure to groundwater is unlikely. On-Site construction workers potentially could ingest, inhale or have dermal contact with any exposed impacted soil, and fill. Similarly, off-Site receptors could be exposed to dust and vapors from on-Site activities. During construction, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through the Soil/Materials Management Plan, dust controls, and through the implementation of the Community Air-Monitoring Program and a Construction Health and Safety Plan.

Under future remediated conditions, all soils in excess of Track 1 SCOs will be removed. With the exception of planting areas, the Site will be fully capped with impervious surfaces, limiting potential direct exposure to soil remaining in place. The Site is served by a public water supply, and groundwater is not used at the Site for potable supply. There are no plausible off-Site pathways for ingestion, inhalation, or dermal exposure to contaminants derived from the Site under future conditions.

Receptor Populations

On-Site Receptors: The Site is currently occupied by a five-story vacant building. Access to the area will be limited by construction fences. Therefore, the only potential receptors include Site representatives, visitors granted access to the Site, and trespassers. During redevelopment of the Site, the on-Site potential receptors will include construction workers, site representatives, and visitors. Once the Site is redeveloped, the on-Site potential sensitive receptors will include adult and child building residents and visitors, as well as workers.

Off-Site Receptors - Potential off-Site receptors within a 0.25-mile radius of the Site include: adult and child residents, and commercial and construction workers, pedestrians, trespassers, and cyclists, based on the following:

1. Commercial Businesses (up to 0.25 mile) – existing and future
2. Residential Buildings (up to 0.25 mile) – existing and future
3. Building Construction/Renovation (up to 0.25 mile) – existing and future
4. Pedestrians, Trespassers, Cyclists (up to .25 mile) – existing and future
5. Schools (up to .25 mile) – existing and future

Overall Human Health Exposure Assessment

There are potential complete exposure pathways for the current site condition. There is a potential complete exposure pathway that requires mitigation during implementation of the remedy. There is no complete exposure pathway under future conditions after the site is developed. This assessment takes into consideration the reasonably anticipated use of the site, which includes a residential/commercial structure and site-wide surface cover cap. Potential post-construction use of groundwater is not considered an option because groundwater in this area of New York City is not used as a potable water source. There are no surface waters in close proximity to the Site that could be impacted or threatened.

During remedial construction, on-Site and off-Site exposures to contaminated dust from historic fill material will be addressed through dust controls, and through the implementation of the Community Air Monitoring Program, the Soil/Materials Management Plan, and a Construction Health and Safety Plan.

After the remedial action is complete, there will be no remaining exposure pathways to on-Site soil/fill or groundwater, as all soil above Site-Specific SCOs will have been removed.

5.0 REMEDIAL ACTION MANAGEMENT

5.1 PROJECT ORGANIZATION AND OVERSIGHT

Principal personnel who will participate in the remedial action include Greg Mendez-Chicas. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Rogers, P.E. and Kevin Kleaka, respectively.

5.2 SITE SECURITY

Site access will be controlled by chain link or wooden construction fence, which will surround the Site with gated locked entrances.

5.3 WORK HOURS

The hours for operation of remedial construction will adhere to the approved New York City Department of Buildings (NYCDOB) Permit(s) and to the NYCDOB construction code requirements. Permitted work hours will be reported to the OER Project Manager once they are issued.

5.4 CONSTRUCTION HEALTH AND SAFETY PLAN

The Health and Safety Plan is included in **Appendix D**. The Site Safety Coordinator will be Greg Mendez-Chicas. Remedial work performed under this RAWP will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the remedial construction work will ensure that performance of work is in compliance with the HASP and applicable laws and regulations. The HASP pertains to remedial and invasive work performed at the Site until the issuance of the Notice of Completion.

All field personnel involved in remedial activities will participate in training required under 29 CFR 1910.120, including 40-hour hazardous waste operator training and annual 8-hour refresher training. Site Safety Officer will be responsible for maintaining workers training records.

Personnel entering any exclusion zone will be trained in the provisions of the HASP and be required to sign an HASP acknowledgment. Site-specific training will be provided to field personnel. Additional safety training may be added depending on the tasks performed. Emergency telephone numbers will be posted at the site location before any remedial work begins. A safety meeting will be conducted before each shift begins. Topics to be discussed include task hazards and protective measures (physical, chemical, environmental); emergency procedures; PPE levels and other relevant safety topics. Meetings will be documented in a log book or specific form.

An emergency contact sheet with names and phone numbers is included in the HASP. That document will define the specific project contacts for use in case of emergency.

5.5 COMMUNITY AIR MONITORING PLAN

Real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the exclusion zone or work area will be performed. Continuous monitoring will be performed for all ground intrusive activities and during the handling of contaminated or potentially contaminated media. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pit excavation or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be performed during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence. Exceedences of action levels observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the OER Project Manager and included in the Daily Report.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis during invasive work. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The

monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

All 15-minute readings must be recorded and be available for OER personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue

with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m³ above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m³ above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m³ of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for OER personnel to review.

5.6 AGENCY APPROVALS

All permits or government approvals required for remedial construction have been or will be obtained prior to the start of remedial construction. Approval of this RAWP by OER does not constitute satisfaction of these requirements and will not be a substitute for any required permit.

5.7 SITE PREPARATION

Pre-Construction Meeting

OER will be invited to attend the pre-construction meeting at the Site with all parties involved in the remedial process prior to the start of remedial construction activities.

Mobilization

Mobilization will be conducted as necessary for each phase of work at the Site. Mobilization includes field personnel orientation, equipment mobilization (including securing all sampling equipment needed for the field investigation), marking/staking sampling locations and utility mark-outs. Each field team member will attend an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures.

Utility Marker Layouts, Easement Layouts

The presence of utilities and easements on the Site will be fully investigated prior to the performance of invasive work such as excavation or drilling under this plan by using, at a minimum, the One-Call System (811). Underground utilities may pose an electrocution, explosion, or other hazard during excavation or drilling activities. All invasive activities will be performed in compliance with applicable laws and

regulations to assure safety. Utility companies and other responsible authorities will be contacted to locate and mark the locations, and a copy of the Markout Ticket will be retained by the contractor prior to the start of drilling, excavation or other invasive subsurface operations. Overhead utilities may also be present within the anticipated work zones. Electrical hazards associated with drilling in the vicinity of overhead utilities will be prevented by maintaining a safe distance between overhead power lines and drill rig masts.

Proper safety and protective measures pertaining to utilities and easements, and compliance with all laws and regulations will be employed during invasive and other work contemplated under this RAWP. The integrity and safety of on-Site and off-Site structures will be maintained during all invasive, excavation or other remedial activity performed under the RAWP.

Equipment and Material Staging

Equipment and materials will be stored and staged in a manner that complies with applicable laws and regulations.

Stabilized Construction Entrance

Steps will be taken to ensure that trucks departing the site will not track soil, fill or debris off-Site. Such actions may include use of cleaned asphalt or concrete roads or use of stone or other aggregate-based egress paths between the truck inspection station and the property exit. Measures will be taken to ensure that adjacent roadways will be kept clean of project related soils, fill and debris.

Truck Inspection Station

An outbound-truck inspection station will be set up close to the Site exit. Before exiting the NYC VCP Site, trucks will be required to stop at the truck inspection station and will be examined for evidence of contaminated soil on the undercarriage, body, and wheels. Soil and debris will be removed. Brooms, shovels and potable water will be utilized for the removal of soil from vehicles and equipment, as necessary.

Extreme Storm Preparedness and Response Contingency Plan

Damage from flooding or storm surge can include dislocation of soil and stockpiled materials, dislocation of site structures and construction materials and equipment, and dislocation of support of excavation structures. Damage from wind during an extreme storm event can create unsafe or unstable structures,

damage safety structures and cause downed power lines creating dangerous site conditions and loss of power. In the event of emergency conditions caused by an extreme storm event, the enrollee will undertake the following steps for site preparedness prior to the event and response after the event.

Storm Preparedness

Preparations in advance of an extreme storm event will include the following: containerized hazardous materials and fuels will be removed from the property; loose materials will be secured to prevent dislocation and blowing by wind or water; heavy equipment such as excavators and generators will be removed from holes, trenches and depressions on the property to high ground or removed from the property; an inventory of the property with photographs will be performed to establish conditions for the site and equipment prior to the event; stockpile covers for soil and fill will be secured by adding weights such as sandbags for added security and worn or ripped stockpile covers will be replaced with competent covers; stockpiled hazardous wastes will be removed from the property; stormwater management systems will be inspected and fortified, including, as necessary: clean and reposition silt fences, haybales; clean storm sewer filters and traps; and secure and protect pumps and hosing.

Storm Response

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to OER at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to public safety authorities via appropriate means such as calling 911. Petroleum spills will be reported to NYS DEC within 2 hours of identification and consistent with State regulations. Emergency and spill conditions will also be reported to OER. Public safety structures, such as construction security fences will be repaired promptly to eliminate public safety threats. Debris will be collected and removed. Dewatering will be performed in compliance with existing laws and regulations and consistent with emergency notifications, if any, from proper authorities. Eroded areas of soil including unsafe slopes will be stabilized and fortified. Dislocated materials will be collected and appropriately managed. Support of excavation structure will be inspected and fortified as necessary. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. Storm-water control systems and structures will be

inspected and maintained as necessary. If soil or fill materials are discharged off site to adjacent properties, property owners and OER will be notified and corrective measure plan designed to remove and clean dislocated material will be submitted to OER and implemented following approval by OER and granting of site access by the property owner. Impacted offsite areas may require characterization based on site conditions, at the discretion of OER. If onsite petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYS DEC's spill hotline at DEC 800-457-7362. If the source of the spill is ongoing and can be identified, it should be stopped if this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYS DEC.

Storm Response Reporting

A site inspection report will be submitted to OER at the completion of site inspection. An inspection report established by OER is available on OER's website (www.nyc.gov/oer) and will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the OER project manager and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number. Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the site; estimates of the volume of soil that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of onsite or offsite exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYS DEC; description of corrective actions; schedule for corrective actions. This report should be completed and submitted to OER project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

5.8 TRAFFIC CONTROL

Drivers of trucks leaving the NYC VCP Site with soil/fill will be instructed to proceed without stopping in the vicinity of the site to prevent neighborhood impacts. The planned route on local roads for trucks leaving the site is the following:

1. Depart west 145th Street toward Broadway
2. Turn right onto Broadway
3. Make a U0turn at W 147th Street
4. Turn right onto west 138th Street (Road name changes to 12th Avenue
5. Turn right onto west 133rd Street
6. Turn left onto Marginal Street
7. Continue onto Manhattan Bridge

In the event of adverse traffic conditions, alternative routes to interstate highways may be chosen. Prevention of neighborhood impacts will be considered in all alternative routes.

5.9 DEMOBILIZATION

Demobilization will include:

- As necessary, restoration of temporary access areas and areas that may have been disturbed to accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water management areas, and access area);
- Removal of sediment from erosion control measures and truck wash and disposal of materials in accordance with applicable laws and regulations;
- Equipment decontamination, and;
- General refuse disposal.

Equipment will be decontaminated and demobilized at the completion of all field activities. Investigation equipment and large equipment (e.g., soil excavators) will be washed at the truck inspection station as necessary. In addition, all investigation and remediation derived waste will be appropriately disposed.

5.10 REPORTING AND RECORD KEEPING

Daily Reports

Daily reports providing a general summary of activities for each day of *active remedial work* will be emailed to the OER Project Manager by the end of the following day. Those reports will include:

- Project number and statement of the activities and an update of progress made and locations of work performed;
- Quantities of material imported and exported from the Site;
- Status of on-Site soil/fill stockpiles;
- A summary of all citizen complaints, with relevant details (basis of complaint; actions taken; etc.);
- A summary of CAMP excursions, if any;
- Photograph of notable Site conditions and activities.

The frequency of the reporting period may be revised in consultation with OER project manager based on planned project tasks. Daily email reports are not intended to be the primary mode of communication for notification to OER of emergencies (accidents, spills), requests for changes to the RAWP or other sensitive or time critical information. However, such information will be included in the daily reports. Emergency conditions and changes to the RAWP will be communicated directly to the OER project manager by personal communication. Daily reports will be included as an Appendix in the Remedial Action Report.

Record Keeping and Photo-Documentation

Job-site record keeping for all remedial work will be performed. These records will be maintained on-Site during the project and will be available for inspection by OER staff. Representative photographs will be taken of the Site prior to any remedial activities and during major remedial activities to illustrate remedial program elements and contaminant source areas. Photographs will be submitted at the completion of the project in the RAR in digital format (i.e. jpeg files).

5.11 COMPLAINT MANAGEMENT

All complaints from citizens will be promptly reported to OER. Complaints will be addressed and outcomes will also be reported to OER in daily reports. Notices to OER will include the nature of the complaint, the party providing the complaint, and the actions taken to resolve any problems.

5.12 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

All changes to the RAWP will be reported to the OER Project Manager and will be documented in daily reports and reported in the Remedial Action Report. The process to be followed if there are any deviations from the RAWP will include a request for approval for the change from OER noting the following:

- Reasons for deviating from the approved RAWP;
- Effect of the deviations on overall remedy; and
- Determination that the remedial action with the deviation(s) is protective of public health and the environment.

5.13 DATA USABILITY SUMMARY REPORT

The primary objective of a Data Usability Summary Report (DUSR) is to determine whether or not data meets the site specific criteria for data quality and data use. The DUSR provides an evaluation of analytical data without third party data validation. The DUSR for post-remedial samples collected during implementation of this RAWP will be included in the Remedial Action Report (RAR).

6.0 REMEDIAL ACTION REPORT

A Remedial Action Report (RAR) will be submitted to OER following implementation of the remedial action defined in this RAWP. The RAR will document that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The RAR will include:

- Information required by this RAWP;
- As-built drawings for all constructed remedial elements, required certifications, manifests and other written and photographic documentation of remedial work performed under this remedy;
- Site Management Plan (if Track 1 is not achieved);
- Description of any changes in the remedial action from the elements provided in this RAWP and associated design documents;
- Tabular summary of all end point sampling results and all material characterization results, QA/QC results for end-point sampling, and other sampling and chemical analysis performed as part of the remedial action and DUSR;
- Test results or other evidence demonstrating that remedial systems are functioning properly;
- Account of the source area locations and characteristics of all contaminated material removed from the Site including a map showing source areas;
- Account of the disposal destination of all contaminated material removed from the Site. Documentation associated with disposal of all material will include transportation and disposal records, and letters approving receipt of the material.
- Account of the origin and required chemical quality testing for material imported onto the Site.
- Recorded Declaration of Covenants and Restrictions.
- Continue registration of the property with an E-Designation by the NYC Department of Buildings.
- Reports and supporting material will be submitted in digital form.

Remedial Action Report Certification

The following certification will appear in front of the Executive Summary of the Remedial Action Report. The certification will include the following statements:

I, Joel Rogers, am currently a professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the Site name Site number.

I certify that the OER-approved Remedial Action Work Plan dated month day year and Stipulations in a letter dated month day, year; if any 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.

7.0 SCHEDULE

The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER. Currently, a four month remediation period is anticipated.

Schedule Milestone	Weeks from Remedial Action Start	Duration (weeks)
OER Approval of RAWP	0	-
Fact Sheet 2 announcing start of remedy	0	-
Mobilization	1	1
Remedial Excavation / Construction	2	4
Submit Remedial Action Report	6	4

TABLES

Table 1 - Soil Analysis Summary
521 West 145th Street, New York, NY

CAS Number	Parameter Name	Parameter ID	NYCRR 375 Unrestricted Use Soil Cleanup Objectives (SCOs)	NYCRR 375 Restricted-Residential Use Soil Cleanup Objectives (SCOs)	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-7
	Sample ID	Depth			3-4 ft. BEG	3.5-4.5 ft. BEG	14-15 ft. BEG	13-14 ft. BEG	2-3 ft. BEG	0-2 ft. BEG	0-2 ft. BEG	22-23 ft. BEG
12674-11-2	Aroclor 1016	PCB	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
1104-28-2	Aroclor 1221	PCB	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
11141-16-5	Aroclor 1232	PCB	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
53469-21-9	Aroclor 1242	PCB	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
12672-29-6	Aroclor 1248	PCB	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
11097-69-1	Aroclor 1254	PCB	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
11096-82-5	Aroclor 1260	PCB	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND
319-85-7	beta-BHC	PESTICIDE	36	360	ND	ND	ND	ND	ND	ND	ND	ND
319-86-8	delta-BHC	PESTICIDE	40	100,000a	ND	ND	ND	ND	ND	ND	ND	ND
60-57-1	Dieldrin	PESTICIDE	5	200	ND	ND	ND	ND	ND	ND	ND	ND
115-29-7	Endosulfan	PESTICIDE	2400	NA	-	-	-	-	-	-	-	-
959-98-8	Endosulfan I	PESTICIDE	2,400	24,000i	ND	ND	ND	ND	ND	ND	ND	ND
33213-65-9	Endosulfan II	PESTICIDE	2,400	24,000i	ND	ND	ND	ND	ND	ND	ND	ND
1031-07-8	Endosulfan Sulfate	PESTICIDE	2,400	24,000i	ND	ND	ND	ND	ND	ND	ND	ND
72-20-8	Endrin	PESTICIDE	14	11,000	ND	ND	ND	ND	ND	ND	ND	ND
58-89-9	gamma-BHC	PESTICIDE	100	1,300	ND	ND	ND	ND	ND	ND	ND	ND
76-44-8	Heptachlor	PESTICIDE	42	2,100	ND	ND	ND	ND	ND	ND	ND	ND
1336-36-3	Polychlorinated Biphenyls	PESTICIDE	100	1,000	ND	ND	ND	ND	ND	ND	ND	ND
	Unit		<i>mg/kg</i>	<i>mg/kg</i>	<i>mg/kg</i>	<i>mg/kg</i>	<i>mg/kg</i>	<i>mg/kg</i>	<i>mg/kg</i>	<i>mg/kg</i>	<i>mg/kg</i>	<i>mg/kg</i>
7440-38-2	Arsenic, As	METAL	13c	16f	3.9	4.1	3	3.7	3.3	24	6.8	3.2
7440-39-3	Barium, Ba	METAL	350c	400	60	61	52	55	73	120	110	98
7440-41-7	Beryllium, Be	METAL	7.2	72	0.31 J	0.27 J	0.27 J	0.24 J	0.26 J	0.58	0.43 J	0.25 J
7440-43-9	Cadmium, Cd	METAL	2.5c	4.3	ND	ND	ND	ND	ND	ND	ND	ND
7440-47-3	Chromium, Cr	METAL	NA	110	10	14	8.6	11	10	19	15	10
18540-29-9	Chromium, hexavalent	METAL	1b	110	ND	ND	ND	ND	ND	ND	ND	ND
16065-83-1	Chromium, trivalent	METAL	30c	180	10	14	8.6	11	10	19	15	10
7440-50-8	Copper, Cu	METAL	50	270	11	10	9.5	12	8.5	11	14	13
57-12-5	Cyanide	METAL	27	27	ND	ND	ND	ND	ND	ND	ND	ND
7439-92-1	Lead, Pb	METAL	63c	400	5.2	8.4	4.5 J	33	5.7	6.9	37	3.7 J
7439-96-5	Manganese, Mn	METAL	1,600c	2,000f	320	250	270	250	190	610	280	310
7439-97-6	Mercury, Hg	METAL	.18c	.81j	ND	ND	ND	ND	ND	0.03 J	0.05 J	ND
7440-02-0	Nickel, Ni	METAL	30	310	10	11	10	11	8.9	10	11	9.8
7782-49-2	Selenium, Se	METAL	3.9c	180	ND	ND	ND	ND	ND	ND	ND	ND
7440-22-4	Silver, Ag	METAL	2	180	ND	ND	ND	ND	ND	ND	ND	ND
7440-66-6	Zinc, Zn	METAL	109c	10,000d	26	23	20	43	24	30	33	19

Notes:

- Shaded/Underlined cells indicate an exceedance of both Unrestricted Use and Restricted Residential Use Criteria
- J = Estimated value. The target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL).
- ug/kg = micrograms per kilogram (ppb)
- mg/kg = milligrams per kilogram (ppm)

Table 2 - Groundwater Analysis Summary
521 West 145th Street, New York, NY

CAS Number	Parameter Name	Parameter ID	NYSDEC TOGS 1.1.1 Groundwater Quality Standards	GW-1
		GW Depth		26-30 ft. BEG
		Date		5/9/2014
	Sample ID	Unit	<i>ug/L</i>	<i>ug/L</i>
71-55-6	1,1,1-Trichloroethane (TCA)	VOC	5	ND
75-34-3	1,1-Dichloroethane	VOC	5	ND
75-35-4	1,1-Dichloroethene	VOC	5	ND
95-63-6	1,2,4-Trimethylbenzene	VOC	5	ND
95-50-1	1,2-Dichlorobenzene	VOC	3	ND
107-06-2	1,2-Dichloroethane	VOC	0.6	0.20 J
108-67-8	1,3,5-Trimethylbenzene	VOC	5	ND
541-73-1	1,3-Dichlorobenzene	VOC	3	ND
106-46-7	1,4-Dichlorobenzene	VOC	3	ND
123-91-1	1,4-Dioxane	VOC	NS	ND
110-57-6	trans-1,4-Dichloro-2-butene	VOC	5	ND
78-93-3	2-Butanone	VOC	50	ND
67-64-1	Acetone	VOC	50	ND
71-43-2	Benzene	VOC	1	ND
56-23-5	Carbon Tetrachloride	VOC	5	ND
108-90-7	Chlorobenzene	VOC	5	ND
67-66-3	Chloroform	VOC	7	ND
156-59-2	cis-1,2-Dichloroethene	VOC	5	7.2
100-41-4	Ethylbenzene	VOC	5	ND
75-09-2	Methylene Chloride	VOC	5	ND
1634-04-4	Methyl Tert-Butyl Ether	VOC	10	ND
91-20-3	Naphthalene	VOC	10	ND
104-51-8	n-Butylbenzene	VOC	5	ND
103-65-1	n-Propylbenzene	VOC	5	ND
135-98-8	sec-Butylbenzene	VOC	5	ND
98-06-6	tert-Butylbenzene	VOC	5	0.83 J
127-18-4	Tetrachloroethene (PCE)	VOC	5	ND
108-88-3	Toluene	VOC	5	ND
95-47-6	o Xylene	VOC	5	ND
	m,p Xylene	VOC	5	ND
1330-20-7	Total Xylenes	VOC	NA	ND
156-60-5	trans-1,2-Dichloroethene	VOC	5	ND
79-01-6	Trichloroethene (TCE)	VOC	5	0.75
75-01-4	Vinyl Chloride	VOC	2	ND
	Total BTEX			ND
	Total VOCs			8.31 J

Table 2 - Groundwater Analysis Summary
521 West 145th Street, New York, NY

CAS Number	Parameter Name	Parameter ID	NYSDEC TOGS 1.1.1 Groundwater Quality Standards	GW-1
		GW Depth		26-30 ft. BEG
		Date		5/9/2014
	Sample ID	Unit	ug/L	ug/L
95-48-7	2-Methylphenol	SVOC	1	ND
88-74-4	2-Nitroaniline	SVOC	NA	ND
88-75-5	2-Nitrophenol	SVOC	NA	ND
91-94-1	3,3-Dichlorobenzidine	SVOC	NA	ND
99-09-2	3-Nitroaniline	SVOC	NA	ND
534-52-1	4,6-Dinitro-2-methylphenol	SVOC	NA	ND
59-50-7	4-Chloro-3-methylphenol	SVOC	NA	ND
106-47-8	4-Chloroaniline	SVOC	NA	ND
100-01-6	4-Nitroaniline	SVOC	NA	ND
100-02-7	4-Nitrophenol	SVOC	NA	ND
83-32-9	Acenaphthene	SVOC	20	ND
208-96-8	Acenaphthylene	SVOC	NS	ND
120-12-7	Anthracene	SVOC	50	ND
56-55-3	Benzo-a-Anthracene	SVOC	0.002	ND
50-32-8	Benzo-a-Pyrene	SVOC	NS	ND
205-99-2	Benzo-b-Fluoranthene	SVOC	0.002	ND
207-08-9	Benzo-k-Fluoranthene	SVOC	0.002	ND
191-24-2	Benzo-g,h,i-Perylene	SVOC	NS	ND
218-01-9	Chrysene	SVOC	0.002	0.06 J
132-64-9	Dibenzofuran	SVOC	NS	ND
53-70-3	Dibenzo-a,h-Anthracene	SVOC	NS	ND
206-44-0	Fluoranthene	SVOC	50	ND
86-73-7	Fluorene	SVOC	50	ND
118-74-1	Hexachlorobenzene	SVOC	0.04	ND
193-39-5	Indeno(1,2,3-cd)Pyrene	SVOC	0.002	ND
95-94-3	1,2,4,5-Tetrachlorobenzene	SVOC	5	ND
87-86-5	Pentachlorophenol	SVOC	1	ND
85-01-8	Phenanthrene	SVOC	50	0.13 J
108-95-2	Phenol	SVOC	1	ND
129-00-0	Pyrene	SVOC	50	ND
	Total cPAHs			0.06 J
	Total SVOCs			0.17 J
72-54-8	4,4-DDD	PESTICIDE	0.3	ND
72-55-9	4,4-DDE	PESTICIDE	0.2	ND
50-29-3	4,4-DDT	PESTICIDE	0.2	ND
309-00-2	Aldrin	PESTICIDE	0	ND
319-84-6	alpha-BHC	PESTICIDE	0.01	ND
5103-71-9	Alpha Chlordane	PESTICIDE	NS	ND
12674-11-2	Aroclor 1016	PCB	NS	ND
1104-28-2	Aroclor 1221	PCB	NS	ND
11141-16-5	Aroclor 1232	PCB	NS	ND
53469-21-9	Aroclor 1242	PCB	NS	ND
12672-29-6	Aroclor 1248	PCB	NS	ND
11097-69-1	Aroclor 1254	PCB	NS	ND
11096-82-5	Aroclor 1260	PCB	NS	ND
319-85-7	beta-BHC	PESTICIDE	0.04	ND

Table 2 - Groundwater Analysis Summary
521 West 145th Street, New York, NY

CAS Number	Parameter Name	Parameter ID	NYSDEC TOGS 1.1.1 Groundwater Quality Standards	GW-1
		GW Depth		26-30 ft. BEG
		Date		5/9/2014
	Sample ID	Unit	ug/L	ug/L
319-86-8	delta-BHC	PESTICIDE	0.04	ND
60-57-1	Dieldrin	PESTICIDE	0.004	ND
115-29-7	Endosulfan	PESTICIDE	NS	-
959-98-8	Endosulfan I	PESTICIDE	NS	ND
33213-65-9	Endosulfan II	PESTICIDE	NS	ND
1031-07-8	Endosulfan Sulfate	PESTICIDE	NS	ND
72-20-8	Endrin	PESTICIDE	0	ND
58-89-9	gamma-BHC	PESTICIDE	0.05	ND
76-44-8	Heptachlor	PESTICIDE	0.04	ND
1336-36-3	Polychlorinated Biphenyls	PESTICIDE	0.09	ND
	Unit		mg/L	mg/L
7440-38-2	Arsenic, As - Dissolved	METAL	25	0.00028 J
7440-39-3	Barium, Ba - Dissolved	METAL	1000	0.09171
7440-41-7	Beryllium, Be - Dissolved	METAL	3	ND
7440-43-9	Cadmium, Cd - Dissolved	METAL	5	ND
7440-47-3	Chromium, Cr - Dissolved	METAL	50	0.00194
7440-48-4	Cobalt, Co - Dissolved	METAL	NS	0.01206
7440-50-8	Copper, Cu - Dissolved	METAL	200	0.00339
7439-89-6	Iron, Fe - Dissolved	METAL	300	0.143
7439-92-1	Lead, Pb - Dissolved	METAL	25	ND
7439-96-5	Manganese, Mn - Dissolved	METAL	300	2.082
7439-97-6	Mercury, Hg - Dissolved	METAL	0.7	ND
7440-02-0	Nickel, Ni - Dissolved	METAL	100	0.02439
7782-49-2	Selenium, Se - Dissolved	METAL	10	ND
7440-22-4	Silver, Ag - Dissolved	METAL	50	ND
7440-28-0	Thallium, Tl - Dissolved	METAL	0.5	ND
7440-62-2	Vanadium, V - Dissolved	METAL	NS	ND
7440-66-6	Zinc, Zn - Dissolved	METAL	2000	0.07506
7440-38-2	Arsenic, As - Total	METAL	25	0.00829
7440-39-3	Barium, Ba - Total	METAL	1000	1.097
7440-41-7	Beryllium, Be - Total	METAL	3	0.00158
7440-43-9	Cadmium, Cd - Total	METAL	5	0.00045
7440-47-3	Chromium, Cr - Total	METAL	50	0.2111
7440-48-4	Cobalt, Co - Total	METAL	NS	0.0558
7440-50-8	Copper, Cu - Total	METAL	200	0.1725
7439-89-6	Iron, Fe - Total	METAL	300	56.9
7439-92-1	Lead, Pb - Total	METAL	25	0.03789
7439-96-5	Manganese, Mn - Total	METAL	300	4.952
7439-97-6	Mercury, Hg - Total	METAL	0.7	ND
7440-02-0	Nickel, Ni - Total	METAL	100	0.1997
7782-49-2	Selenium, Se - Total	METAL	10	0.00274 J
7440-22-4	Silver, Ag - Total	METAL	50	0.00032 J
7440-28-0	Thallium, Tl - Total	METAL	0.5	0.00045 J
7440-62-2	Vanadium, V - Total	METAL	NS	0.049
7440-66-6	Zinc, Zn - Total	METAL	2000	0.6396

Note(s):

- Shaded/Bolded values indicate an exceedance of NYSDEC TOGS 1.1.1 Groundwater Quality Standards
J = Estimated value. The Target analyte concentration is below the quantitation limit (RL),
but above the Method Detection Limit (MDL)

ug/L = micrograms per liter

mg/L = milligrams per liter

Table 3 - Sub-Slab Soil Vapor Analysis Summary
521 West 145th Street, New York, NY

CAS Number	Parameter Name	SV-1	SV-2	SV-3	SV-4	SV-5	IA-1	IA-2	QA-1	USEPA 2001: BASE Indoor Air Concentrations (90th Percentile)	NYSDOH Indoor/Outdoor Air Guidelines Values	NYSDOH Matrix 1/2
	Date	4/17/2014	4/17/2014	4/17/2014	4/17/2014	4/17/2014	4/17/2014	4/17/2014	4/17/2014			
	Unit	µg/m ³	µg/m ³	µg/m ³								
71-55-6	1,1,1-Trichloroethane (TCA)	ND	20.6	-	<i>Mon./Mit./<100</i>							
79-34-5	1,1,2,2-Tetrachloroethane	ND	NA	-	-							
79-00-5	1,1,2-Trichloroethane	ND	1.5	-	-							
75-34-3	1,1-Dichloroethane	ND	0.7	-	-							
75-35-4	1,1-Dichloroethene	ND	1.4	-	-							
95-63-6	1,2,4-Trimethylbenzene	1.41	1.66	2.19	2.04	2.34	ND	ND	ND	9.5	-	-
106-93-4	1,2-Dibromoethane	ND	1.5	-	-							
95-50-1	1,2-Dichlorobenzene	ND	1.2	-	-							
107-06-2	1,2-Dichloroethane	ND	0.9	-	-							
78-87-5	1,2-Dichloropropane	ND	1.6	-	-							
120-82-1	1,2,4-Trichlorobenzene	ND	6.8	-	-							
108-67-8	1,3,5-Trimethylbenzene	ND	3.7	-	-							
541-73-1	1,3-Dichlorobenzene	ND	2.4	-	-							
106-99-0	1,3-Butadiene	ND	ND	0.779	ND	ND	ND	ND	ND	3	-	-
106-46-7	1,4-Dichlorobenzene	ND	5.5	-	-							
123-91-1	1,4-Dioxane	ND	NA	-	-							
540-84-1	2,2,4-Trimethylpentane	1.78	1.07	2.57	1.53	1.06	ND	ND	ND	NA	-	-
78-93-3	2-Butanone	0.796	ND	1.58	0.696	0.95	ND	ND	ND	12	-	-
591-78-6	2-Hexanone	ND	NA	-	-							
108-10-1	4-Methyl-2-Pentanone	ND	6	-	-							
107-05-1	3-Chloropropene	ND	NA	-	-							
622-96-8	4-Ethyltoluene	ND	3.6	-	-							
67-64-1	Acetone	14.3	25.4	32.5	10.9	21.7	3.04	4.44	6.56	98.9	-	-
71-43-2	Benzene	ND	ND	0.942	ND	ND	ND	ND	0.732	9.4	-	-
100-44-7	Benzyl chloride	ND	6.8	-	-							
75-27-4	Bromodichloromethane	ND	NA	-	-							
75-25-2	Bromoform	ND	NA	-	-							
74-83-9	Bromomethane	ND	1.7	-	-							
75-15-0	Carbon Disulfide	ND	ND	ND	1.49	ND	ND	ND	ND	4.2	-	-
56-23-5	Carbon Tetrachloride	ND	ND	ND	ND	ND	0.428	0.447	0.491	1.3	-	<i>Mon./Mit./<5</i>
108-90-7	Chlorobenzene	ND	0.9	-	-							

Table 3 - Sub-Slab Soil Vapor Analysis Summary
521 West 145th Street, New York, NY

CAS Number	Parameter Name	SV-1	SV-2	SV-3	SV-4	SV-5	IA-1	IA-2	QA-1	USEPA 2001: BASE Indoor Air Concentrations (90th Percentile)	NYSDOH Indoor/Outdoor Air Guidelines Values	NYSDOH Matrix 1/2	
		4/17/2014	4/17/2014	4/17/2014	4/17/2014	4/17/2014	4/17/2014	4/17/2014	4/17/2014	4/17/2014	ua/m ³	ua/m ³	ua/m ³
	Date	4/17/2014	4/17/2014	4/17/2014	4/17/2014	4/17/2014	4/17/2014	4/17/2014	4/17/2014	4/17/2014	ua/m ³	ua/m ³	ua/m ³
	Unit	ua/m ³	ua/m ³	ua/m ³	ua/m ³								
75-00-3	Chloroethane	ND	1.1	-	-								
67-66-3	Chloroform	ND	1.1	-	-								
74-87-3	Chloromethane	0.469	0.601	0.774	0.564	0.76	1.07	1.05	1.24	3.7	-	-	
542-75-6	cis-1,3-Dichloropropene	ND	2.3	-	-								
156-59-2	cis-1,2-Dichloroethene	ND	1.9	-	-								
110-82-7	Cyclohexane	ND	1.04	2.19	ND	ND	ND	1.20	ND	NA	-	-	
75-71-8	Dichlorodifluoromethane	1.93	2.31	2.15	2.32	1.12	1.83	1.34	2.35	16.5	-	-	
100-41-4	Ethylbenzene	ND	ND	1.33	ND	0.877	ND	ND	ND	5.7	-	-	
64-17-5	Ethanol	18.3	14.2	31.3	16.3	14.9	ND	ND	15.4	210	-	-	
141-78-6	Ethyl Acetate	ND	5.4	-	-								
76-14-2	Freon-114	ND	NA	-	-								
142-82-5	Heptane	ND	ND	1.37	ND	ND	ND	ND	ND	NA	-	-	
87-68-3	Hexachlorobutadiene	ND	6.8	-	-								
67-63-0	Isopropanol	2.83	1.88	5.51	3.32	1.99	ND	ND	2.2	250	-	-	
75-09-2	Methylene Chloride	ND	ND	20.2	ND	ND	ND	ND	14.3	10	60	-	
1634-04-4	Methyl Tert-Butyl Ether	ND	11.5	-	-								
110-54-3	n-Hexane	0.885	ND	3.95	ND	ND	ND	ND	0.754	10.2	-	-	
1330-20-7	p/m-Xylene	2.08	2.09	4.69	2.69	3.17	ND	ND	ND	22.2	-	-	
95-47-6	o-Xylene	0.93	0.93	1.90	1.27	1.44	ND	ND	ND	7.9	-	-	
100-42-5	Styrene	ND	1.9	-	-								
127-18-4	Tetrachloroethene (PCE)	ND	ND	ND	ND	ND	0.454	0.448	0.237	15.9	30.0	Mon./Mit./<100	
109-99-9	Tetrahydrofuran	0.959	0.667	2.37	0.838	0.882	ND	ND	ND	NA	-	-	
108-88-3	Toluene	2.78	2.30	5.65	2.48	2.89	ND	ND	0.867	43	-	-	
156-60-5	trans-1,2-Dichloroethene	ND	NA	-	-								
10061-02-6	trans-1,3-Dichloropropene	ND	1.3	-	-								
79-01-6	Trichloroethene (TCE)	ND	4.2	5.0	Mon./Mit./<5								
75-69-4	Trichlorofluoromethane	1.50	1.62	2.10	1.79	1.94	1.49	1.55	1.67	18.1	-	-	
593-60-2	Vinyl bromide	ND	NA	-	-								
75-01-4	Vinyl Chloride	ND	<1.9	-	-								
	Helium	0.336	0.17	0.636	ND	0.182	-	-	-	NA	-	-	

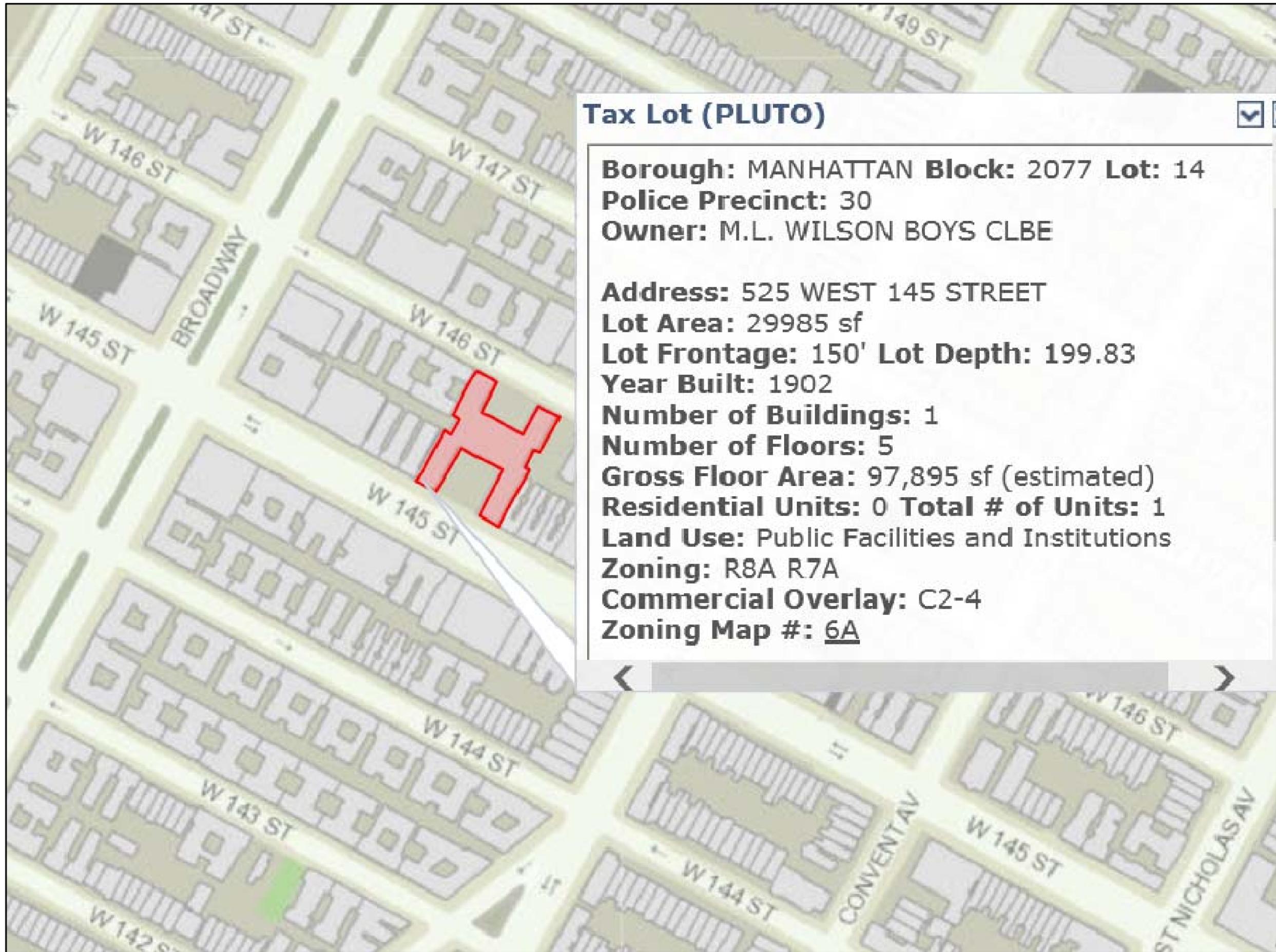
Notes:

ua/m³ = micrograms per cubic meter

FIGURES



PROJECT # 6627-01-02-2000	FIGURE #	1
	TITLE: Site Location Map	
DRAWN BY: GMC		
CHECKED BY: KK		
DATE: 12/4/13		
SCALE:		
521 West 145th Street, New York, NY		
IMPACT ENVIRONMENTAL 170 KEYLAND COURT BOHEMIA, NEW YORK 11716 TEL (631) 269-8800 FAX (631) 269-1599 1000 PAGE AVENUE LYNHURST, NEW JERSEY 07071		
		



Tax Lot (PLUTO)

Borough: MANHATTAN **Block:** 2077 **Lot:** 14
Police Precinct: 30
Owner: M.L. WILSON BOYS CLBE

Address: 525 WEST 145 STREET
Lot Area: 29985 sf
Lot Frontage: 150' **Lot Depth:** 199.83
Year Built: 1902
Number of Buildings: 1
Number of Floors: 5
Gross Floor Area: 97,895 sf (estimated)
Residential Units: 0 **Total # of Units:** 1
Land Use: Public Facilities and Institutions
Zoning: R8A R7A
Commercial Overlay: C2-4
Zoning Map #: 6A

TITLE: **Site Location Map**

PROJECT # 6627-01-02-2000

FIGURE # 2

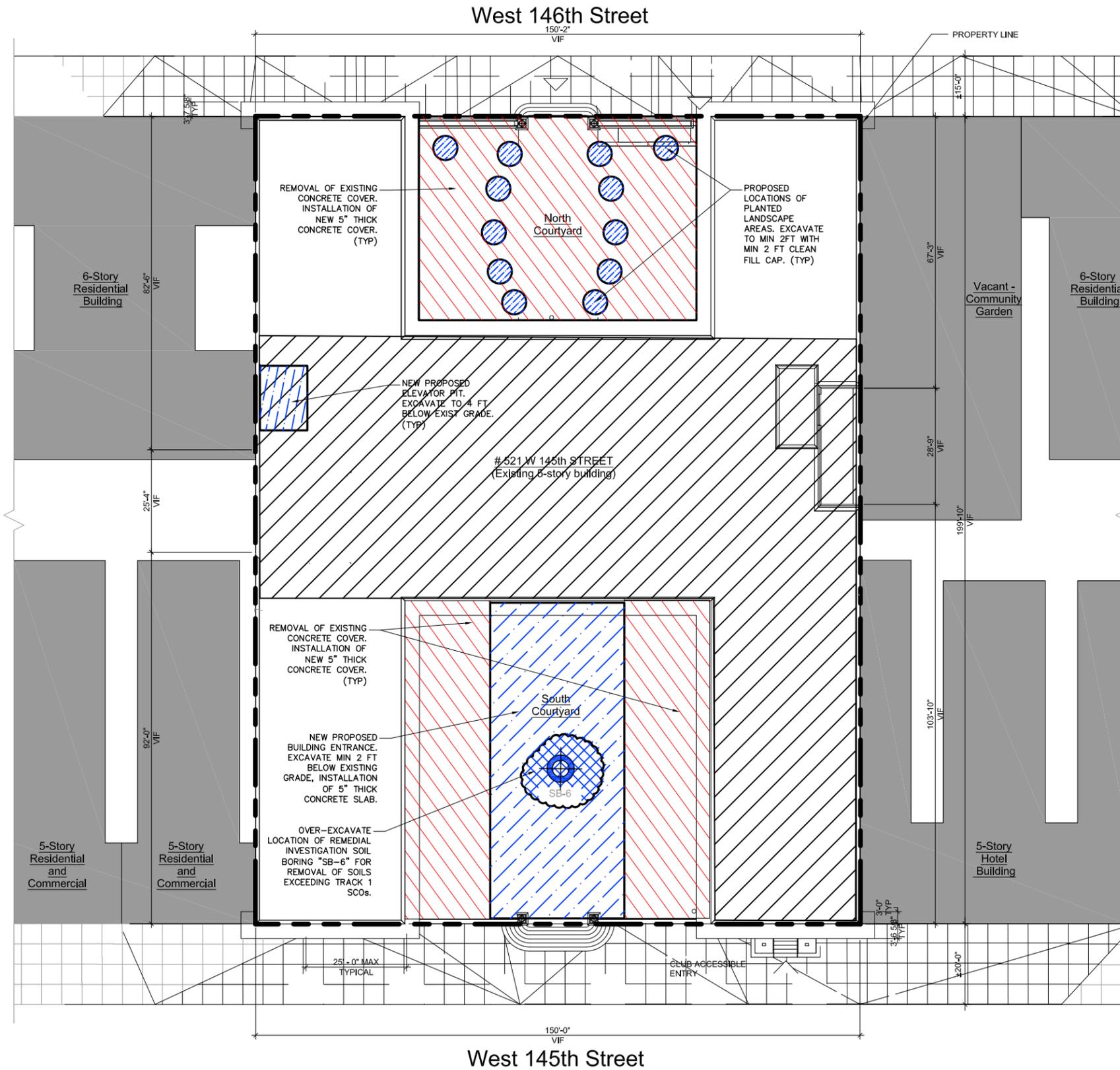
521 West 145th Street,
 New York, NY

DRAWN BY:	GMC
CHECKED BY:	KK
DATE:	12/4/13
SCALE:	

IMPACT ENVIRONMENTAL

170 KEYLAND COURT
 BOHEMIA, NEW YORK 11716
 TEL (631) 269-8800 FAX (631) 269-1599
 1000 PAGE AVENUE
 LYNHURST, NEW JERSEY 07071





IMPACT ENVIRONMENTAL

170 KEYLAND COURT
BOHEMIA, NEW YORK 11716
TEL (631) 269-8800 FAX (631) 269-1599

1000 PAGE AVENUE
LYNDHURST, NEW JERSEY 07071

TITLE:

**Figure 3 -
Excavation &
Composite Cover
Map**

SITE:

521 West 145th Street
New York, NY

DRAWING NO:

PROJECT NO:	6627
DESIGNED BY:	GMC
DRAWN BY:	GMC
CHECKED BY:	KK
DATE:	9/27/2014
SCALE:	1" = 30'

REVISIONS

NO.	DATE:

LEGEND:

-  NEW 5" CONCRETE COMPOSITE COVER INSTALLATION
-  PROPOSED EXCAVATION AREAS FOR REDEVELOPMENT. INSTALLATION OF COMPOSITE COVER OR MIN. 2FT CLEAN FILL COVER.
-  AREA TO BE DELINEATED AND OVER-EXCAVATED FOR THE REMOVAL OF SOILS EXCEEDING TRACK 1 SCOs. INSTALLATION OF COMPOSITE COVER OR MIN. 2FT CLEAN FILL COVER.

APPENDIX A

CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and BGCH Apartments, LLC have established this Citizen Participation Plan because the opportunity for citizen participation is an important component of the NYC Voluntary Cleanup Program. This Citizen Participation Plan describes how information about the project will be disseminated to the Community during the remedial process. As part of its obligations under the NYC VCP, BGCH Apartments, LLC will maintain a repository for project documents and provide public notice at specified times throughout the remedial program. This Plan also takes into account potential environmental justice concerns in the community that surrounds the project Site. Under this Citizen Participation Plan, project documents and work plans are made available to the public in a timely manner. Public comment on work plans is strongly encouraged during public comment periods. Work plans are not approved by the NYC Office of Environmental Remediation (OER) until public comment periods have expired and all comments are formally reviewed. An explanation of cleanup plans in the form of a public meeting or informational session is available upon request to OER's project manager assigned to this Site, Rebecca Bub, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 788-8841

Project Contact List. OER has established a Site Contact List for this project to provide public notices in the form of fact sheets to interested members of the Community. Communications will include updates on important information relating to the progress of the cleanup program at the Site as well as to request public comments on the cleanup plan. The Project Contact List includes owners and occupants of adjacent buildings and homes, principal administrators of nearby schools, hospitals and day care centers, the public water supplier that serves the area, established document repositories, the representative Community Board, City Council members, other elected representatives and any local Brownfield Opportunity Area (BOA) grantee organizations. Any member of the public or organization will be added to the Site Contact List on request. A copy of the Site Contact List is maintained by OER's project manager. If you would like to be added to the Project Contact List, contact NYC OER at (212) 788-8841 or by email at brownfields@cityhall.nyc.gov.

Repositories. A document repository is maintained in the nearest public library that maintains evening and weekend hours. This document repository is intended to house, for community review, all principal documents generated during the cleanup program including Remedial Investigation plans and reports, Remedial Action work plans and reports, and all public notices and fact sheets produced during the

lifetime of the remedial project. BGCH Apartments, LLC will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

New York Public Library – Hamilton Grange Library

503 West 145th Street, New York, NY 10031

(212) 926-2147

Hours of Operation:

Mon 11:00 AM - 7:00 PM

Tue 1:00 PM - 6:00 PM

Wed 11:00 AM - 7:00 PM

Thu 11:00 PM - 6:00 PM

Fri 10:00 AM - 5:00 PM

Sat 10:00 AM - 5:00 PM

Sun closed

Digital Documentation. NYC OER strongly encourages the use of digital documents in repositories as a means of minimizing paper use while also increasing convenience in access and ease of use.

Identify Issues of Public Concern. The major issues of concern to the public will be potential impacts of nuisance odors and dust during the disturbance of historic fill soils at the Site. This work will be performed in accordance with procedures which will be specified under a detailed Remedial Program which considers and takes preventive measures for exposures to future residents of the property and those on adjacent properties during construction. Detailed plans to monitor the potential for exposure including a Construction Health and Safety Plan and a Community Air Monitoring Plan are required components of the remedial program. Implementation of these plans will be under the direct oversight of the New York City Office of Environmental Remediation (NYCOER).

These plans will specify the following worker and community health and safety activities during remedial activity at the Site:

- On-Site air monitoring for worker protection,
- Perimeter air monitoring for community protection.

The Health and Safety Plan and the Community Air Monitoring Plan prepared as part of the Remedial Action Work Plan will be available for public review at the document repository.

Public Notice and Public Comment. Public notice to all members of the Project Contact List is required at three major steps during the performance of the cleanup program (listed below) and at other points that may be required by OER. Notices will include Fact Sheets with descriptive project summaries, updates on recent and upcoming project activities, repository information, and important phone and email contact information. All notices will be prepared BGCH Apartments, LLC, reviewed and approved by OER prior to distribution and mailed by BGCH Apartments, LLC. Public comment is solicited in public notices for all work plans developed under the NYC Voluntary Cleanup Program. Final review of all work plans by OER will consider all public comments. Approval will not be granted until the public comment period has been completed.

Citizen Participation Milestones. Public notice and public comment activities occur at several steps during a typical NYC VCP project. See flow chart on the following page, which identifies when during the NYC VCP public notices are issued: These steps include:

- **Public Notice of the availability of the Remedial Investigation Report and Remedial Action Work Plan and a 30-day public comment period on the Remedial Action Work Plan.**

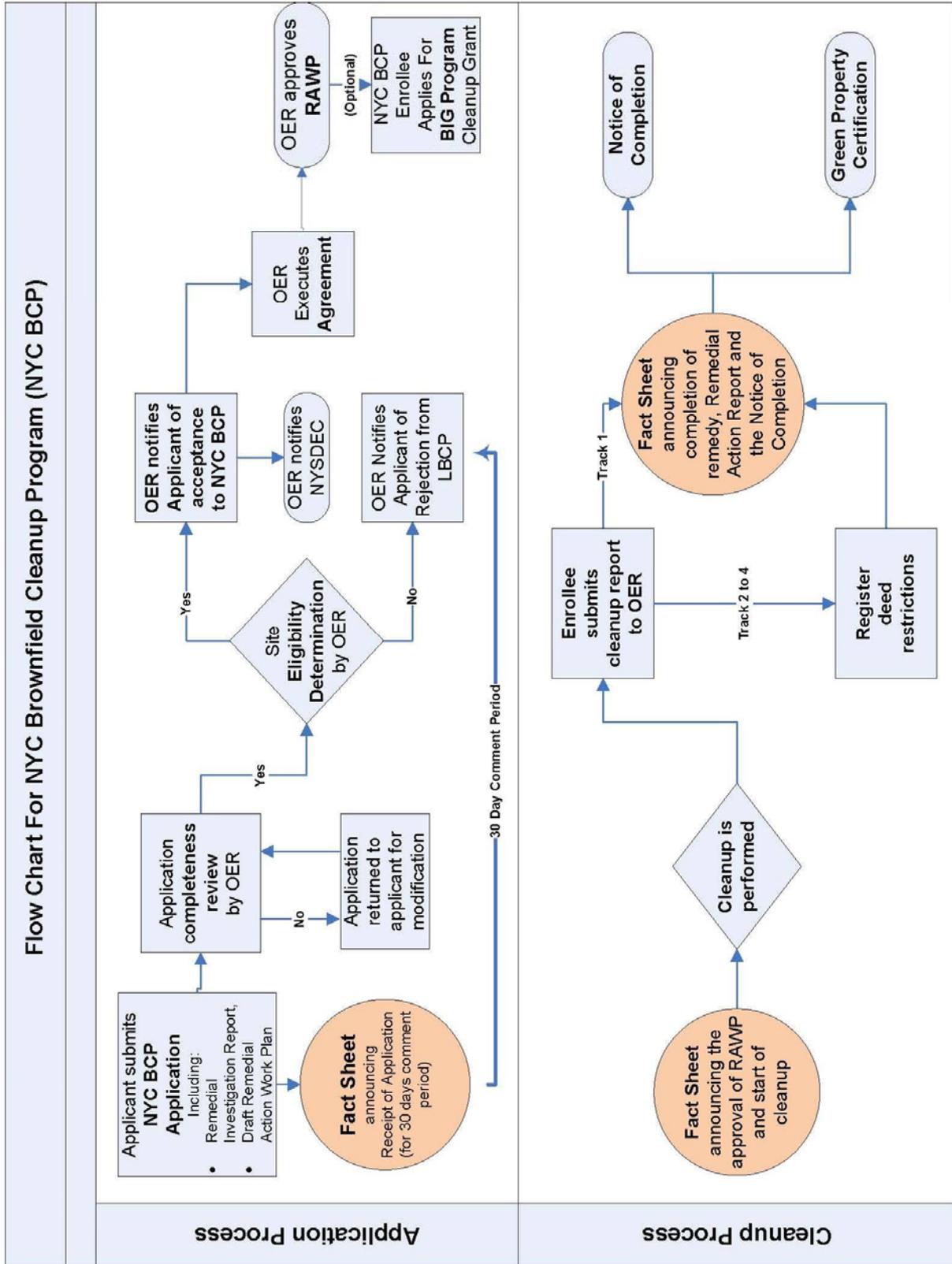
Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the availability of the Remedial Investigation Report and Remedial Action Work Plan and the initiation of a 30-day public comment period on the Remedial Action Work Plan. The Fact Sheet summarizes the findings of the RIR and provides details of the RAWP. The public comment period will be extended an additional 15 days upon public request. A public meeting or informational session will be conducted by OER upon request.

- **Public Notice announcing the approval of the RAWP and the start of remediation**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the approval of the RAWP and the start of remediation.

- **Public Notice announcing the completion of remediation, designation of Institutional and Engineering Controls and issuance of the Notice of Completion**

Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the completion of remediation, providing a list of all Institutional and Engineering Controls implemented for to the Site and announcing the issuance of the Notice of Completion.



APPENDIX B

SUSTAINABILITY STATEMENT

This Sustainability Statement documents sustainable activities and green remediation efforts planned under this remedial action.

Reuse of Clean, Recyclable Materials. Reuse of clean, locally-derived recyclable materials reduces consumption of non-renewable virgin resources and can provide energy savings and greenhouse gas reduction.

This project intends to use recycled concrete aggregate wherever possible in grading and backfilling the Site. An estimate of the quantity (in tons) of clean, non-virgin materials (reported by type of material) reused under this plan will be quantified and reported in the RAR.

Reduce Consumption of Virgin and Non-Renewable Resources. Reduced consumption of virgin and non-renewable resources lowers the overall environmental impact of the project on the region by conserving these resources.

The project will reduce the consumption of virgin materials by substituting recycled concrete aggregate for mined gravel and/or sand backfill whenever possible.

An estimate of the quantity (in tons) of virgin and non-renewable resources, the use of which will be avoided under this plan, will be quantified and reported in the RAR.

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.

Recycled concrete materials and other backfill materials will be locally sourced reducing the energy consumption associated with transporting these materials to the Site.

Best efforts will be made to quantify energy efficiencies achieved during the remediation and will be reported in the Remedial Action Report (RAR). Where energy savings cannot be easily quantified, a gross indicator of the amount of energy saved or the means by which energy savings was achieved will be reported.

Conversion to Clean Fuels. Use of clean fuel improves NYC's air quality by reducing harmful emissions.

An estimate of the volume of clean fuels used during remedial activities will be quantified and reported in the RAR.

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 or impede future redevelopment. Recontamination can arise from future releases that occur within the property or by influx of contamination from off-Site.

The installation of a composite cover system throughout the exterior surface areas of the Site will eliminate the risk of future migration of soil contamination.

An estimate of the area of the Site that utilizes recontamination controls under this plan will be reported in the RAR in square feet.

Storm-water Retention. Storm-water retention improves water quality by lowering the rate of combined storm-water and sewer discharges to NYC's sewage treatment plants during periods of precipitation, and reduces the volume of untreated influent to local surface waters.

An estimate of the enhanced storm-water retention capability of the redevelopment project will be included in the RAR.

Linkage with Green Building. Green buildings provide a multitude of benefits to the city across a broad range of areas, such as reduction of energy consumption, conservation of resources, and reduction in toxic materials use.

The number of Green Buildings that are associated with this brownfield redevelopment property will be reported in the RAR. The total square footage of green building space created as a function of this brownfield redevelopment will be quantified for residential, commercial and industrial/manufacturing uses.

Paperless Brownfield Cleanup Program. BGCH Apartments, LLC is participating in OER's Paperless Brownfield Cleanup Program. Under this program, submission of electronic documents will replace submission of hard copies for the review of project documents, communications and milestone reports.

Low-Energy Project Management Program. BGCH Apartments, LLC is participating in OER's low-energy project management program. Under this program, whenever possible, meetings are held using remote communication technologies, such as videoconferencing and teleconferencing to reduce energy consumption and traffic congestion associated with personal 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.

An estimate of the land area that will be vegetated, including the number of trees planted or preserved, will be reported in square feet in the RAR.

APPENDIX C

SOIL/MATERIALS MANAGEMENT PLAN

1.1 SOIL SCREENING METHODS

Visual, olfactory and PID soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional and will be reported in the RAR. Soil screening will be performed during invasive work performed during the remedy and development phases prior to issuance of the Notice of Completion.

1.2 STOCKPILE METHODS

Excavated soil from suspected areas of contamination (e.g., hot spots, USTs, drains, etc.) will be stockpiled separately and will be segregated from clean soil and construction materials. Stockpiles will be used only when necessary and will be removed as soon as practicable. While stockpiles are in place, they will be inspected daily, and before and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. Excavated soils will be stockpiled on, at minimum, double layers of 8-mil minimum sheeting, will be kept covered at all times with appropriately anchored plastic tarps, and will be routinely inspected. Broken or ripped tarps will be promptly replaced.

All stockpile activities will be compliant with applicable laws and regulations. Soil stockpile areas will be appropriately graded to control run-off in accordance with applicable laws and regulations. Stockpiles of excavated soils and other materials shall be located at least of 50 feet from the property boundaries, where possible. Hay bales or equivalent will surround soil stockpiles except for areas where access by equipment is required. Silt fencing and hay bales will be used as needed near catch basins, surface waters and other discharge points.

1.3 CHARACTERIZATION OF EXCAVATED MATERIALS

Soil/fill or other excavated media that is transported off-Site for disposal will be sampled in a manner required by the receiving facility, and in compliance with applicable laws and regulations. Soils proposed for reuse on-Site will be managed as defined in this plan.

1.4 MATERIALS EXCAVATION, LOAD-OUT AND DEPARTURE

The PE/QEP overseeing the remedial action will:

- oversee remedial work and the excavation and load-out of excavated material;
- ensure that there is a party responsible for the safe execution of invasive and other work performed under this work plan;
- ensure that Site development activities and development-related grading cuts will not interfere with, or otherwise impair or compromise the remedial activities proposed in this RAWP;
- ensure that the presence of utilities and easements on the Site has been investigated and that any identified risks from work proposed under this plan are properly addressed by appropriate parties;
- ensure that all loaded outbound trucks are inspected and cleaned if necessary before leaving the Site;
- ensure that all egress points for truck and equipment transport from the Site will be kept clean of Site-derived materials during Site remediation.

Locations where vehicles exit the Site shall be inspected daily for evidence of soil tracking off premises. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

Open and uncontrolled mechanical processing of historical fill and contaminated soil on-Site will not be performed without prior OER approval.

1.5 OFF-SITE MATERIALS TRANSPORT

Loaded vehicles leaving the Site will comply with all applicable materials transportation requirements (including appropriate covering, manifests, and placards) in accordance with applicable laws and regulations, including use of licensed haulers in accordance with 6 NYCRR Part 364. If loads contain wet material capable of causing leakage from trucks, truck liners will be used. Queuing of trucks will be performed on-Site, when possible in order to minimize off Site disturbance. Off-Site queuing will be minimized.

Outbound truck transport routes are as follows:

8. Depart west 145th Street toward Broadway
9. Turn right onto Broadway

10. Make a U0turn at W 147th Street
11. Turn right onto west 138th Street (Road name changes to 12th Avenue
12. Turn right onto west 133rd Street
13. Turn left onto Marginal Street
14. Continue onto Manhattan Bridge

In the event of adverse traffic conditions, alternative routes to interstate highways may be chosen. Prevention of neighborhood impacts will be considered in all alternative routes.

This routing takes into account the following factors: (a) limiting transport through residential areas and past sensitive sites; (b) use of mapped truck routes; (c) minimizing off-Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport. To the extent possible, all trucks loaded with Site materials will travel from the Site using these truck routes. Trucks will not stop or idle in the neighborhood after leaving the project Site.

1.6 MATERIALS DISPOSAL OFF-SITE

The following documentation will be established and reported by the PE/QEP for each disposal destination used in this project to document that the disposal of regulated material exported from the Site conforms with applicable laws and regulations: (1) a letter from the PE/QEP or Enrollee to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in Manhattan, New York under a governmental remediation program. The letter will provide the project identity and the name and phone number of the PE/QEP or Enrollee. The letter will include as an attachment a summary of all chemical data for the material being transported; and (2) a letter from each disposal facility stating it is in receipt of the correspondence (1, above) and is approved to accept the material. These documents will be included in the RAR.

The Remedial Action Report will include an itemized account of the destination of all material removed from the Site during this remedial action. Documentation associated with disposal of all material will include records and approvals for receipt of the material. This information will be presented in the RAR.

All impacted soil/fill or other waste excavated and removed from the Site will be managed as regulated material and will be disposed in accordance with applicable laws and regulations. Historic fill and contaminated soils taken off-Site will be handled as solid waste and will not be disposed at a Part 360-16 Registration Facility (also known as a Soil Recycling Facility).

Waste characterization will be performed for off-Site disposal in a manner required by the receiving facility and in conformance with its applicable permits. Waste characterization sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the RAR. A manifest system for off-Site transportation of exported materials will be employed. Manifest information will be reported in the RAR. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable laws and regulations.

If disposal of soil/fill from this Site is proposed for unregulated disposal (i.e., clean soil removed for development purposes), including transport to a Part 360-16 Registration Facility, a formal request will be made for approval by OER with an associated plan compliant with 6NYCRR Part 360-16. This request and plan will include the location, volume and a description of the material to be recycled, including verification that the material is not impacted by site uses and that the material complies with receipt requirements for recycling under 6NYCRR Part 360. This material will be appropriately handled on-Site to prevent mixing with impacted material.

1.7 MATERIALS REUSE ON-SITE

Soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan may be reused on-Site. The soil cleanup objectives for on-Site reuse of Track 1 SCOs are listed in **Table 4**, if Track 1 SCOs are not achieved; the Track 2 Restricted Residential Soil Cleanup Objectives for on-Site reuse are listed in the Remedial Action Work Plan Section 4.2 and **Table 6**. ‘Reuse on-Site’ means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on comparable soil/fill material, and addressed pursuant to the NYC VCP agreement subject to Engineering and Institutional Controls. The PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this RAWP are followed.

Reuse of onsite soil is not anticipated. If reuse of onsite soil becomes necessary, soil proposed for reuse will be segregated onsite in a separate stockpile. Composite samples of soil will be taken at a minimum frequency of one sample for every 500 cubic yards of material. The soil samples will be submitted to an ELAP certified lab for chemical analysis. Laboratory results will be compared to Track 1 or Track 2 SCOs to determine if soil is acceptable for onsite reuse.

Organic matter (wood, roots, stumps, etc.) or other waste derived from clearing and grubbing of the Site will not be buried on-Site. Soil or fill excavated from the site for grading or other purposes will not be reused within a cover soil layer or within landscaping berms.

1.8 DEMARCATION

After completion of hotspot removal and any other invasive remedial activities, and prior to backfilling, the top of the residual soil/fill will be defined by one of three methods: (1) placement of a demarcation layer. The demarcation layer will consist of geosynthetic fencing or equivalent material to be placed on the surface of residual soil/fill to provide an observable reference layer. A description or map of the approximate depth of the demarcation layer will be provided in the SMP; or (2) a land survey of the top elevation of residual soil/fill before the placement of cover soils, pavement and associated sub-soils, or other materials or structures or, (3) all materials beneath the approved cover will be considered impacted and subject to site management after the remedy is complete. Demarcation may be established by one or any combination of these three methods. As appropriate, a map showing the method of demarcation for the Site and all associated documentation will be presented in the RAR.

This demarcation will constitute the top of the site management horizon. Materials within this horizon require adherence to special conditions during future invasive activities as defined in the Site Management Plan.

1.9 IMPORT OF BACKFILL SOIL FROM OFF-SITE SOURCES

This Section presents the requirements for imported fill materials to be used below the cover layer and within the clean soil cover layer. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. The backfill and cover soil quality objectives (NYCRR Part 35 Unrestricted Use SCOs) are listed in **Table 1**.

A process will be established to evaluate sources of backfill and cover soil to be imported to the Site, and will include an examination of source location, current and historical use(s), and any applicable documentation. Material from industrial sites, spill sites, environmental remediation sites or other potentially contaminated sites will not be imported to the Site.

The following potential sources may be used pending attainment of backfill and cover soil quality objectives:

- Clean soil from construction projects at non-industrial sites in compliance with applicable laws and regulations;
- Clean soil from roadway or other transportation-related projects in compliance with applicable laws and regulations;
- Clean recycled concrete aggregate (RCA) from facilities permitted or registered by the regulations of NYS DEC.

All materials received for import to the Site will be approved by a PE/QEP and will be in compliance with provisions in this RAWP. The RAR will report the source of the fill, evidence that an inspection was performed on the source, chemical sampling results, frequency of testing, and a Site map indicating the locations where backfill or soil cover was placed.

Source Screening and Testing

Inspection of imported fill material will include visual, olfactory and PID screening for evidence of contamination. Materials imported to the Site will be subject to inspection, as follows:

- Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;
- The PE/QEP is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and
- Fill material will be free of solid waste including pavement materials, debris, stumps, roots, and other organic matter, as well as ashes, oil, perishables or foreign matter.

Composite samples of imported material will be taken at a minimum frequency of one sample for every 500 cubic yards of material. Once it is determined that the fill material meets imported backfill or cover soil chemical requirements and is non-hazardous, and lacks petroleum contamination, the material will be loaded onto trucks for delivery to the Site.

Recycled concrete aggregate (RCA) will be imported from facilities permitted or registered by NYSDEC. Facilities will be identified in the RAR. A PE/QEP is responsible to ensure that the facility is compliant with 6NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA. RCA imported from compliant facilities will not require additional testing, unless required by NYSDEC under its terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete. RCA material is not acceptable for, and will not be used as cover material.

1.10 FLUIDS MANAGEMENT

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable laws and regulations. Liquids discharged into the New York City sewer system will receive prior approval by New York City Department of Environmental Protection (NYC DEP). The NYC DEP regulates discharges to the New York City sewers under Title 15, Rules of the City of New York Chapter 19. Discharge to the New York City sewer system will require an authorization and sampling data demonstrating that the groundwater meets the City's discharge criteria. The dewatering fluid will be pretreated as necessary to meet the NYC DEP discharge criteria. If discharge to the City sewer system is not appropriate, the dewatering fluids will be managed by transportation and disposal at an off-Site treatment facility.

Discharge of water generated during remedial construction to surface waters (i.e. a stream or river) is prohibited without a SPDES permit issued by New York State Department of Environmental Conservation.

1.11 STORM-WATER POLLUTION PREVENTION

Applicable laws and regulations pertaining to storm-water pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in this RAWP (silt fences and barriers, and hay bale checks) will be installed around the entire perimeter of the remedial construction area and inspected once a week and after every storm event to ensure that they are operating appropriately. Discharge locations will be inspected to determine whether erosion control measures are effective in preventing significant impacts to receptors. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. All necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. Undercutting or erosion of the silt fence toe anchor will be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

1.12 CONTINGENCY PLAN

This contingency plan is developed for the remedial construction to address the discovery of unknown structures or contaminated media during excavation. Identification of unknown contamination source areas during invasive Site work will be promptly communicated to OER's Project Manager. Petroleum spills will be reported to the NYS DEC Spill Hotline. These findings will be included in the daily report. If previously unidentified contaminant sources are found during on-Site remedial excavation or

development-related excavation, sampling will be performed on contaminated source material and surrounding soils and reported to OER. Chemical analytical testing will be performed for TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

1.13 ODOR, DUST AND NUISANCE CONTROL

Odor Control

All necessary means will be employed to prevent on- and off-Site odor nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) use of foams to cover exposed odorous soils. If odors develop and cannot otherwise be controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-Site disposal; and (e) use of chemical odorants in spray or misting systems.

This odor control plan is capable of controlling emissions of nuisance odors. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. OER will be notified of all odor complaint events. Implementation of all odor controls, including halt of work, will be the responsibility of the PE/QEP's certifying the Remedial Action Report.

Dust Control

Dust management during invasive on-Site work will include, at a minimum:

- Use of a dedicated water spray methodology for roads, excavation areas and stockpiles.
- Use of properly anchored tarps to cover stockpiles.
- Exercise extra care during dry and high-wind periods.
- Use of gravel or recycled concrete aggregate on egress and other roadways to provide a clean and dust-free road surface.

This dust control plan is capable of controlling emissions of dust. If nuisance dust emissions are identified, work will be halted and the source of dusts will be identified and corrected. Work will not resume until all nuisance dust emissions have been abated. OER will be notified of all dust complaint events. Implementation of all dust controls, including halt of work, will be the responsibility of the PE/QEP's responsible for certifying the Remedial Action Report.

Other Nuisances

Noise control will be exercised during the remedial program. All remedial work will conform, at a minimum, to NYC noise control standards.

Rodent control will be provided, during Site clearing and grubbing, and during the remedial program, as necessary, to prevent nuisances.

APPENDIX D
CONSTRUCTION HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

June 10, 2014

Submitted for:

PS 186 / Boys & Girls Club of Harlem
521 West 145th Street
New York, New York 10031
(Block 2077, Lot 14)
OER Project Number 14EH-N421M
E-Designation E-284
CEQR Number 12DCP070M
West Harlem Rezoning

Submitted to:

New York City Office of Environmental Remediation
100 Gold Street, 2nd Floor
New York, NY 10038

Prepared for:

BGCH Apartments, LLC
155 3rd Street
Brooklyn, New York 11231

Submitted by:

Impact Environmental Closures, Inc.
170 Keyland Court
Bohemia, NY 11716

IE Project Number:

6671-01-02-2000



TABLE OF CONTENTS

1	Introduction.....	6
1.1	Purpose	6
2	Application of Health and Safety Plan	8
2.1	Restoration Personnel	8
2.1.1	<i>Construction Personnel</i>	8
3	Key Personnel / Identification of Health & Safety Personnel.....	9
3.1	Key Personnel	9
3.2	Organizational Responsibility	9
3.2.1	<i>Project Manager</i>	9
3.2.2	<i>Field Operations Leader</i>	10
3.2.3	<i>Site Health and Safety Officer</i>	10
4	Health and Safety Risk Analysis.....	12
4.1	Explosion and Fire	12
4.1.1	<i>Flammable Vapors</i>	12
4.1.2	<i>High Oxygen Levels</i>	12
4.1.3	<i>Fire Prevention</i>	12
4.2	Operational Safety Hazards	13
4.2.1	<i>Heavy Machinery / Equipment</i>	13
4.2.2	<i>Vehicular Traffic</i>	13
4.3	Noise Hazards	14
4.4	Safe Material Handling.....	14
4.5	Temperature Hazards	14
4.5.1	<i>Types of Heat Stress</i>	15
4.5.2	<i>Heat Stress Prevention</i>	15
4.6	Cold Exposure Hazards.....	16
5	Personnel Training	17
5.1	Pre-assignment and OSHA Training.....	17
5.2	Respirator Requirements.....	17
5.2.1	<i>Respirator Requirements and Fit Testing</i>	17
5.2.2	<i>Medical Surveillance</i>	18
6	Personal Protective Equipment.....	19
6.1.1	<i>Levels of Protection</i>	19

6.1.2	<i>Level D Personal Protective Equipment</i>	19
6.1.3	<i>Modified Level D Personal Protective Equipment</i>	20
6.1.4	<i>Level C Personal Protective Equipment</i>	20
6.1.5	<i>Level B Personal Protective Equipment</i>	21
6.1.6	<i>Personal Use Factors and Equipment Change Out Schedule</i>	21
7	Community Air Monitoring Program	23
7.1	Organic Compounds.....	23
7.2	Fugitive Emissions and Odor Monitoring.....	24
7.3	Site Matrix for Protection Level Determinations.....	26
7.4	Work Zone Definitions	27
7.4.1	<i>Exclusion Zone (EZ)</i>	27
7.4.2	<i>Contaminant Reduction Zone (CRZ)</i>	27
7.4.3	<i>Support Zone (SZ)</i>	27
7.4.4	<i>Fugitive Dust Control Measures</i>	27
7.5	Backfilling	28
8	General Safety and Health Provisions	29
8.1	Safety Practices / Standing Orders	29
8.2	Buddy System.....	30
8.3	Site Communications Plan	30
8.4	Retention of Records	31
9	Decontamination Plan	32
9.1	General.....	32
9.2	Minimum Decontamination Procedure.....	33
9.3	Standard Decontamination Procedure.....	33
9.3.1	<i>Level B</i>	33
9.3.2	<i>Level C and Level D</i>	34
9.4	Heavy Equipment and Handling Equipment Decontamination.....	34
10	Emergency Response / Contingency Plan	36
10.1	Pre-Emergency Planning.....	36
10.1.1	<i>Zinc Material Safety Data Sheet</i>	37
10.1.2	<i>Magnesium Material Safety Data Sheet</i>	39
10.1.3	<i>Copper Material Safety Data Sheet</i>	41
10.1.4	<i>Cadmium Material Safety Data Sheet</i>	43
10.1.5	<i>Diesel Engine Oil Material Safety Data Sheet</i>	45

10.1.6	<i>Lead-Free Gasoline; No-lead Gasoline – Gasoline, Unleaded Material Safety Data Sheet</i>	51
10.1.7	<i>Lead Material Safety Data Sheet</i>	55
10.1.8	<i>Arsenic Material Safety Data Sheet</i>	60
10.1.9	<i>Selenium Material Safety Data Sheet</i>	64
10.1.10	<i>Nickel Material Safety Data Sheet</i>	66
10.1.11	<i>Chromium Material Safety Data Sheet</i>	68
10.1.12	<i>Calcium Material Safety Data Sheet</i>	70
10.1.13	<i>Beryllium Material Safety Data Sheet</i>	72
10.1.14	<i>Beryllium Material Safety Data Sheet</i>	76
10.1.15	<i>Mercury Material Safety Data Sheet</i>	83
10.2	Emergency Contact Information	88
10.2.1	<i>Emergency Contacts</i>	88
10.2.2	<i>Utility Emergencies / Initiating Subsurface Investigation Work</i>	89
10.3	Contingency / Evacuation Plan	89
10.4	Emergency Medical Treatment Procedures	90
10.4.1	<i>Standard Procedures for Injury</i>	91
10.4.2	<i>Chemical Overexposure</i>	91
10.4.3	<i>First Aid for Injuries Incurred During Field Work</i>	92
10.4.4	<i>First Aid Equipment List</i>	92
10.4.5	<i>Other Emergency Equipment</i>	93
10.5	Record of Injuries Incurred On-Site	94
10.5.1	<i>Occupational Injuries and Illnesses Form (OSHA 200)</i>	94
10.5.2	<i>Employer’s First Report of Injury</i>	94

APPENDICES

APPENDIX A Accident Report Form

APPENDIX B OSHA Form 300-Occupational Injuries & Illnesses

APPENDIX C Safety Meeting Sheet

APPENDIX D Vapor Monitoring Sheet

1 Introduction

This Health and Safety Plan (HASP) describes the procedures to be followed in order to reduce employee exposure to potential health and safety hazards that may be present during environmental investigation activities being performed at the site. The emergency response procedures necessary to respond to such hazards are also described within this HASP. The project involves environmental sampling activities that will include the collection of soil and groundwater samples. All activities performed under this HASP are targeted to comply with Occupational Safety and Health Administration (OSHA) Regulations 29 CFR Part 1910.1025.

This document is not, nor does it purport to be, a complete description of all safety and health requirements applicable to work performed at the site. Rather, the HASP is a general overview of the compliance policies and work practices applicable to the primary tasks and hazards associated with the environmental assessment portion of the development project, as well as a recitation of minimum safety and health compliance obligations for contractors, subcontractors and workers at the site. All subcontractors of any tier operating at the worksite are obligated to implement and maintain comprehensive safety and health plans for their own employees and to ensure that their employees comply with all applicable safety and health requirements. All subcontractors operating at the worksite should refer to the applicable specific OSHA Standards for detailed requirements.

1.1 Purpose

The purpose of this HASP is to provide the contractors' field personnel, as well as other site-occupants, with an understanding of the potential chemical and physical hazards that exist or may arise while portions of this project are being performed. To this end, this HASP also presents information on the progression of the environmental restoration activities and specific details regarding the handling of materials excavated from the site.

The primary objective is to ensure the well being of all field personnel and the community surrounding this site. In order to accomplish this, project staff and approved subcontractors of any tier shall acknowledge and adhere to the policies and procedures established herein. Accordingly, all personnel assigned to the remediation activities associated with this project (Remedial Personnel) shall read this

HASP and sign the Agreement and Acknowledgment Statement (Appendix F) to certify that they have read, understood, and agree to abide by its provisions. A copy of this HASP will be available to anyone that requests it. Personnel involved in construction activities (Construction Personnel) and other Personnel (e.g. government officials, administrators, bank inspectors, assessors, etc.) that will have limited exposure to the site native soil/fill material during construction activities will be instructed on how to reduce the probability of exposure to site contaminants, but will not be required read the HASP.

2 Application of Health and Safety Plan

The procedures of this HASP apply for any person that will enter the boundaries of the site or a portion of the Site during environmental remediation activities or construction, until the existing soil/fill material has been covered with either a paved surface or an uncontaminated soil cap. When the Project Manager has designated an area of the site as clear of any environmental issues, construction contractors and subcontractors of any tier will perform the balance of the work in accordance with their individual OSHA-compliant corporate HASP.

2.1 Restoration Personnel

Employees of contractors and subcontractors of any tier performing the following activities will be considered Restoration Personnel:

- ◆ Excavation of native soil/fill material
- ◆ Loading of native soil/fill onto vehicles
- ◆ Processing of native soil/fill into components
- ◆ Transporting of native soil/fill across the site
- ◆ Sampling of native soil/fill material for subsequent physical or chemical analysis
- ◆ Cleaning or decontaminating equipment or personnel
- ◆ Handling of ground waters

All subcontractors, of any tier, must submit a HASP to the Site Health and Safety Officer for review and approval prior to mobilizing to the site. Only HASPs that comply with this HASP will be approved. Where a subcontractors HASP is deficient, the Site Health and Safety Officer will provide written notification of any required changes. Approved HASPs will be submitted to the Project Manager and retained on-site for reference by the Site Health and Safety Officer.

2.1.1 Construction Personnel

For this document, "Construction Personnel" is the term given for those employees of contractors and subcontractors of any tier performing activities associated with site development other than those performed by the Remedial Personnel. This designation does not preclude that Construction Personnel will traverse or work upon native soil/fill material, rather, it infers that it will not involve performing

tasks that will create a route of exposure to the contaminants contained therein. Construction Personnel will receive instruction to limit the potential for exposure to these contaminants. Construction Personnel will be prohibited from entering Environmental Remediation Areas (i.e., active excavation / handling / processing areas, loading areas, exclusion zones or support zones).

3 Key Personnel / Identification of Health & Safety Personnel

3.1 Key Personnel

A list of the pertinent personnel authorized to be present on site is as follows:

Title	Name	Telephone Number
Project Manager <i>Impact Environmental</i>	Greg Mendez-Chicas	(O) 631-269-8800 (C) 631-252-5480
Field Operations Leader <i>Impact Environmental</i>	Dan Fruhauf	(O) 631-269-8800 (C) 631-334-1431
Site Health & Safety Officer <i>Impact Environmental</i>	Chris McGualey	(O) 631-269-8800 (C) 631-664-1966

3.2 Organizational Responsibility

3.2.1 Project Manager

The Project Manager will be responsible for implementing the project and obtaining any necessary personnel or resources for the completion of the project. Specific duties will include:

- ◆ Coordinating the activities of all construction and Remedial Personnel, to include informing them of the required Personal Protective Equipment (PPE) and insuring their signature acknowledging this HASP;
- ◆ Selecting a Site Health and Safety Officer and field personnel for the work to be undertaken on site;
- ◆ Ensuring that the tasks assigned are being completed as planned and on schedule;

- ◆ Providing authority and resources to ensure that the Site Health and Safety Officer is able to implement and manage safety procedures;
- ◆ Preparing reports and recommendations about the project to clients and affected personnel;
- ◆ Ensuring that all persons allowed to enter the site (e.g., EPA, contractors, state officials, visitors) are made aware of the potential hazards associated with the substances known or suspected to be on site, and are knowledgeable as to the on-site copy of the specific HASP;
- ◆ Ensuring that the Site Health and Safety Officer is aware of all of the provisions of this HASP and is instructing all personnel on site about the safety practices and emergency procedures defined in the plan;
- ◆ Serving as liaison with public officials where there is no Public Affairs official designated.

3.2.2 Field Operations Leader

The Field Operations Leader will be responsible for field operations and safety. Specific duties will include, but are not limited to:

- ◆ Scheduling with the construction company and their subcontractors;
- ◆ Coordinating with the Site Health and Safety Officer in determining protection levels;
- ◆ Documenting field activities;
- ◆ Coordinate activities between environmental and construction personnel.
- ◆ Coordination with waste management contractors.
- ◆ Review and approval of waste disposal facilities.

In the event that the Project Manager and the Site Health and Safety Officer are not on site, the Field Operations Leader will assume all responsibility of the Site Health and Safety Officer.

3.2.3 Site Health and Safety Officer

The Site Health and Safety Officer shall be responsible for the implementation of the HASP on site. Specific duties will include:

- ◆ Monitoring the compliance of construction and environmental remediation activities personnel (field personnel) for the routine and proper use of the PPE that has been designated for each task;

- ◆ Routinely inspecting PPE and clothing to ensure that it is in good condition and is being stored and maintained properly;
- ◆ Stopping work on the site or changing work assignments or procedures if any operation threatens the health and safety of workers or the public;
- ◆ Monitoring personnel who enter and exit the site and all controlled access points.
- ◆ Reporting any signs of fatigue, work-related stress, or chemical exposures to the Project Manager;
- ◆ Dismissing field personnel from the site if their actions or negligence endanger themselves, co-workers, or the public, and reporting the same to the Project Manager;
- ◆ Reporting any accidents or violations of the HASP plan to the Project Manager and documenting the same for the project in the records;
- ◆ Knowing emergency procedures, evacuation routes, and the telephone numbers of the ambulance, local hospital, poison control center, fire and police departments;
- ◆ Ensuring that all project-related personnel have signed the personnel agreement and acknowledgments form contained in this HASP;
- ◆ Coordinate upgrading and downgrading PPE as necessary due to changes in exposure levels, monitoring results, weather, and other site conditions;
- ◆ Perform air monitoring with approved instruments in accordance with requirements stated in this HASP.

4 Health and Safety Risk Analysis

The field tasks covered by the HASP will include material excavation with hydraulic equipment and hand tools, the manual sorting of materials, and containerization of soil and groundwater samples. Additionally, standard job task hazards that are inherent to a construction project will exist.

4.1 Explosion and Fire

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to explosion and fire. Rather, contractors, subcontractors and workers at the site must refer to OSHA's Fire Protection and Prevention Standard, set forth at 29 C.F.R. § 1910 part 1926.35, as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations. The following are possible fire and explosion hazards that may be encountered on the job site along with fire preventive measures to take.

4.1.1 *Flammable Vapors*

The presence of flammable vapors can pose a potential fire and health hazard. Hazard reduction procedures include monitoring the ambient air with an oxygen/LEL meter (combustible gas indicator). If the LEL reading exceeds 20%, all work will stop and employees will leave the site immediately and contact the fire department. For OSHA-defined "confined space" activities, work will stop if the LEL reading exceeds 10%.

4.1.2 *High Oxygen Levels*

Atmospheres that contain a level of oxygen greater than 23% pose an extreme fire hazard (the usual ambient oxygen level is approximately 20.5%). All personnel encountering atmospheres that contain a level of oxygen greater than 23% must evacuate the site immediately and must notify the Fire Department. If the oxygen level is less than 19.5%, do not enter the space without level B PPE.

4.1.3 *Fire Prevention*

- During equipment operation, periodic vapor concentration measurements should be taken with an explosimeter or combustimeter. If at any time the vapor concentrations exceed 20% of the lower explosive limit (LEL), then the Site Health and Safety Officer or designated field worker should immediately shut down all operations.

- Only approved safety cans will be used to transport and store flammable liquids.
- All gasoline and diesel-driven engines requiring refueling must be shut down and allowed to cool prior to filling.
- Smoking is not allowed during any operations within the work area in which petroleum products or solvents in free-floating, dissolved, or vapor forms, or other flammable liquids may be present.
- No open flame or spark is allowed in any area containing petroleum products or other flammable liquids.

4.2 Operational Safety Hazards

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to earth moving equipment. Rather, contractors, subcontractors and workers at the site must refer to OSHA's Excavation Standard, set forth at 29 C.F.R. § 1910 Subpart P as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations.

4.2.1 *Heavy Machinery / Equipment*

All site employees must remain aware of those site activities that involve the use of heavy equipment and machinery. Respiratory protection and protective eyewear may be worn frequently during site activities. This protective equipment significantly reduces peripheral vision of the wearer. Therefore, it is essential that all employees at the site exercise extreme caution during operation of equipment and machinery to avoid physical injury to themselves or others.

4.2.2 *Vehicular Traffic*

All employees will be required to wear a fluorescent safety vest at all times while on site. In addition, supplemental traffic safety equipment use can be exercised when warranted by specific task. Supplemental equipment can be items such as cones, flags, barricades, and/or caution tape. Drivers of waste transportation vehicles will only exit vehicles in designated areas within the Support Zone. During this time, drivers will only be allowed to inspect the placement of waste loads and cover their trailers.

4.3 Noise Hazards

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to noise hazards. Rather, contractors, subcontractors and workers at the site must refer to OSHA's Occupational Noise Exposure Standard, set forth at 29 C.F.R. § 1910 part 1926.52, as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations.

Hearing protection shall be provided to the employees where sound pressure levels exceed 85 dB. Hearing protection shall be worn where sound pressure levels in areas and/or on equipment exceeds 90 dB. Typical heavy excavation operations have been monitored with a sound level meter and indicate that hearing protection is required for all personnel while engaged in this action.

4.4 Safe Material Handling

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to safe material (soil/fill) handling. Rather, contractors, subcontractors and workers at the site must refer to OSHA's Eye and Face, and Respiratory Safety Standards, set forth at 29 C.F.R. § 1910 Parts 1926.102 and 1926.103 as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations.

Skin and eye contact with contaminated soil/fill or materials in contact with the soil/fill may occur during excavation, handling and decontamination activities. Nitrile gloves and approved safety glasses must be worn to prevent exposure to the associated contaminants. Employees working at or near (within ten feet of) excavation fronts could be required to wear respiratory protection. If necessary, all associated activities will be performed pursuant to 29 C.F.R. § 1910 Parts 1926.134 (a)(2) and 1926.55.

4.5 Temperature Hazards

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to temperature stresses. Rather, contractors, subcontractors and workers at the site must refer to OSHA's Technical Manual (TED 1-0.15A), Section III – Chapter 4 (1999) as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations.

Since climatic changes cannot be avoided, work schedules will be adjusted to provide time intervals for intake of juices, juice products, and water in an area free from contamination and in quantities appropriate for fluid replacement to prevent heat stress conditions from occurring.

4.5.1 Types of Heat Stress

Heat stress may occur even in moderate temperature areas and may present any or all of the following:

4.5.1.1 Heat Rash

Result of continuous exposure to heat, humid air, and chafing clothes. Heat rash is uncomfortable and decreases the ability to tolerate heat.

4.5.1.2 Heat Cramps

Result of the inadequate replacement of body electrolytes lost through perspiration. Signs include severe spasms and pain in the extremities and abdomen.

4.5.1.3 Heat Exhaustion

Result of increased stress on the vital organs of the body in the effort to meet the body's cooling demands. Signs include shallow breathing; pale, cool, moist skin; profuse sweating; and dizziness.

4.5.1.4 Heat Stroke

Result of overworked cooling system. Heat stroke is the most serious form of heat stress. Body surfaces must be cooled and medical help must be obtained immediately to prevent severe injury and/or death. Signs include red, hot, dry skin, absence of perspiration, nausea, dizziness and confusion, strong, rapid pulse that could lead to coma or death.

4.5.2 Heat Stress Prevention

- A. Replace body fluids (water and electrolytes) lost through perspiration. Solutions may include a 0.1% salt and water solution or commercial mixes such as "Gatorade". Employees must be encouraged to drink more than the amount required in order to satisfy thirst.
- B. Use cooling devices to aid the natural body ventilation. Cooling occurs through evaporation of perspiration and limited body contact with heat-absorbing protective clothing. Utilize fans and air

conditioners to assist in evaporation. Long, cotton underwear is suggested to absorb perspiration and limit any contact with heat-absorbing protective clothing (i.e., coated Tyvek suits).

- C. Conduct non-emergency response activities in the early morning or evening during very hot weather.
- D. Provide shelter against heat and direct sunlight to protect personnel. Take breaks in shaded areas.
- E. Rotate workers utilizing protective clothing during hot weather.
- F. Establish a work regime that will provide adequate rest periods, with personnel working in shifts.

4.6 Cold Exposure Hazards

Work schedules will be adjusted to provide sufficient rest periods in a heated area for warming up during operations conducted in cold weather. Also, thermal protective clothing such as wind and/or moisture resistant outerwear is recommended to be worn.

If work is performed continuously in the cold at or below -7°C (20°F), including wind chill factor, heated warming shelters (tents, cabins, company vehicles, rest rooms, etc.) shall be made available nearby and the worker should be encouraged to use these shelters at regular intervals, the frequency depending on the severity of the environmental exposure. The onset of heavy shivering, frostnip, the feeling of excessive fatigue, drowsiness, irritability, or euphoria, are indications for immediate return to the shelter. When entering the heated shelter, the outer layer of clothing shall be removed and the remainder of the clothing loosened to permit sweat evaporation. A change of dry work clothing shall be provided as necessary to prevent workers from returning to their work with wet clothing.

Dehydration, or the loss of body fluids, occurs in the cold environment and may increase the susceptibility of the worker to cold injury due to a significant change in blood flow to the extremities. Warm sweet drinks and soups should be provided at the work site to provide caloric intake and fluid volume. The intake of coffee should be limited because of a diuretic and circulatory effect (adapted from TLV's and Biological Exposure Indices 1988-1989, ACGIH).

5 Personnel Training

5.1 Pre-assignment and OSHA Training

All Remedial Personnel that will be in direct contact (that is hand digging, sampling, processing) with the native soil/fill materials must complete an initial 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training course and, where necessary, a current eight hour refresher course (as required annually after initial 40-hour training completion). Restoration Personnel that will not be in direct contact with native soil/fill materials are only required to prove they have read and understood the procedures presented in this HASP.

On-site managers and supervisors of Restoration Personnel (Field Operations Leader, Site Health and Safety Officer) directly responsible for employees engaged in hazardous substance operations have received an initial 40-hour HAZWOPER training course and an additional (above the 40-hour HAZWOPER) eight hours of supervisory training. These training requirements comply with the OSHA Hazardous Waste Operations and Emergency Response Regulation, 29 CFR 1910.120. The Site Health and Safety Officer will be certified in First Aid and Cardiovascular Pulmonary Resuscitation.

The Site Health and Safety Officer will conduct an on-site training meeting for all Construction Personnel and observers that could potentially be exposed to the native soil/fill material during construction activities. Training meetings will be provided routinely for any new project personnel. This program will cover specific health and safety equipment and protocols and potential problems inherent to each project operation. The Site Health and Safety Officer will be present for any activities being performed by Construction Personnel that will involve the handling of soil/fill during construction activities to provide supervision on exposure reduction. This may include insuring the use of proper PPE and air quality monitoring.

5.2 Respirator Requirements

5.2.1 Respirator Requirements and Fit Testing

The OSHA respiratory protection standard, 29 CFR 1910.134, under paragraph (f)(2), requires fit testing for all employees using tight fitting respirators including filtering facepiece respirator. The fit test must

be performed before the respirator is used and must be repeated at least annually and whenever a different respirator facepiece is used or a change in the employee's physical condition could affect the respirator fit.

The user seal check is a separate requirement under paragraph (g)(1)(iii) and must be performed each time the employee dons the respirator. Employers must adhere to the recommendations of the respirator's manufacturer; different manufacturers recommend different procedures.

5.2.2 Medical Surveillance

OSHA requires a medical evaluation to determine whether each employee required to wear a respirator is physically able to wear a respirator and perform the work. This evaluation can be a medical examination or an evaluation of employee responses to the OSHA Respirator Medical Evaluation Questionnaire located in Appendix C of the Respiratory Protection Standard. Either method must be performed by a physician or other licensed healthcare professional. Appendix E has a copy of the forms to be completed.

A medical examination may be necessary whenever the employee gives a positive response to any of questions 1 through 8 in Appendix C, Part A, Section 2.

6 Personal Protective Equipment

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to personal protective equipment. Rather, contractors, subcontractors and workers at the site must refer to OSHA's Personal Protective Equipment Standard, set forth at 29 C.F.R. § 1910.Part 1926.28(a) as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations.

The purpose of personal protective clothing and equipment (PPE) is to shield or isolate individuals from the chemical, physical, and biological hazards that may be encountered on-site when engineering and other controls are not feasible or cannot provide adequate protection. Careful selection and use of adequate PPE should protect the health of all on-site workers. No single combination of PPE is capable of protecting against all hazards. Therefore, PPE should be used in conjunction with, not in place of, other protective methods, such as engineering controls and safe work practices.

Site-specific chemicals of concern include semi-volatile organic compounds. These chemicals are of moderate to low hazard. Therefore, level D personal protective equipment will be required at all times when on site. The following is a breakdown of the types of protective clothing and equipment to be used during the site activities.

6.1.1 Levels of Protection

The Site Health and Safety Officer will determine whether a level of protection should be upgraded or downgraded. Changes in the level of protection will be recorded in the dedicated site logbook along with the rationale for the changes (see Section 7.1.3 for additional information on PPE upgrades). Level D PPE will be the minimum requirement at all times during the environmental remediation portion of the project.

6.1.2 Level D Personal Protective Equipment

All initial site access and activities will be done in Level D attire. Level D protection is sufficient under conditions where no contaminants are present or those activities that do not pose a potential threat of unexpected inhalation of or contact with hazardous levels of any substances. Typical Level D activities may include sediment, logging and groundwater sampling, and as surficial site surveys.

- Hard hat
- Safety glasses (as appropriate)
- Steel toe and shank boots
- Fluorescent vest
- Hearing protection (as appropriate)

6.1.3 Modified Level D Personal Protective Equipment

- Hard hat
- Safety glasses
- Steel toe and shank boots
- Fluorescent vest
- Nitrile "N-Dex" inner gloves
- Latex outer boots (chemical resistant)
- Polyethylene coated Tyvek suit
- Hearing protection (as appropriate)

6.1.4 Level C Personal Protective Equipment

Level C protection, as described in this plan, will be available at a minimum for those activities that involve surface and subsurface soil (strata disturbance such as well installation, and all subsurface media sampling activities such as split-spoon sampling and borings). Level C protection equipment should be readily available at all times. Consistent with OSHA training, prior to donning Level C, oxygen percent must be continuously monitored.

- Buddy system required at all times
- Full face respirator with NIOSH approved OV/AG/HEPA combination cartridges (MSA GMC-H)
- Saranex coated Tyvek Suit
- Inner Nitrile "N-Dex" gloves
- Outer Nitrile (NBR) gloves
- Steel toe and shank boots
- Outer boots (chemical resistant)
- Hard hat
- Hearing protection (as appropriate)

6.1.5 Level B Personal Protective Equipment

Some activities may require Level B protection. In atmospheres potentially containing toluene and xylenes, the protective ensemble should include chemical resistant clothing since the two compounds have skin absorption potential.

Regional Health and Safety representatives must be on site upon start-up of any project requiring level B protection. This should be understood to include subcontractors conducting Level B activity.

- Buddy system required at all times
- Supplied air respirator or SCBA
- Saranex coated Tyvek Suit
- Inner Nitrile "N-Dex" gloves
- Outer Nitrile (NBR) gloves
- Steel toe and shank boots
- Outer boots (chemical resistant)
- Hard hat
- Hearing protection (as appropriate)

6.1.6 Personal Use Factors and Equipment Change Out Schedule

Prohibitive or precautionary measures should be taken as necessary to prevent workers from jeopardizing safety during equipment use.

If necessary, all respiratory protective equipment used will be approved by NIOSH/MSHA. Respirator cartridges will be changed once per eight-hour shift at a minimum. This can be accomplished at the end of the workday during respirator decontamination. Employees working within the excavation front should change the cartridge of their respirators once every four hours. If odor breakthrough is detected while wearing the respirator or if breathing becomes difficult, change cartridges immediately. A filter change out schedule is provided below.

Remedial Worker	Work Area	Filter Type	Replacement Rate
Site Screener	EZ – At Excavation Front	MSA GMC-H	Every 4 Hours
Laborer	EZ – At Excavation Front	MSA GMC-H	Every 2 Hours
	SZ, CRZ	MSA GMC-H	Every 8 Hours
Equipment Operator	EZ	MSA GMC-H	Every 4 Hours
	SZ, CRZ	MSA GMC-H	Every 8 Hours
Administrator	EZ	MSA GMC-H	Every 4 Hours
	SZ, CRZ	MSA GMC-H	Every 8 Hours

When utilizing protective garments such as Tyvek suits, gloves, and booties, all seams between protective items will be sealed with duct tape.

Contact with contaminated surfaces, or surfaces suspected of being contaminated, should be avoided. This includes walking through, kneeling in, or placing equipment in puddles, mud, discolored surfaces, or on drums and other containers.

Eating, smoking, drinking, and/or the application of cosmetics in the immediate work area is prohibited. Ingestion of contaminants or absorption of contaminants into the skin may occur.

The use of contact lenses on the job site is strongly advised against. Contact lenses may trap contaminants and/or particulate between the lens and eye, causing irritation. However, when glasses are not available, contact lenses are preferred over faulty vision. When contact lenses are worn, safety glasses and/or goggles must be worn at all times while on the job site. Wearing contact lenses with a respirator in a contaminated atmosphere is prohibited under 29 CFR ss1910.134 (e)(5)(iii).

7 Community Air Monitoring Program

During excavation, waste handling, and material transport, the air in work areas will be sampled periodically (on the site and at the property lines) for the presence of contaminants. Levels of organic vapors in the ambient air will be monitored during the fieldwork to ensure that appropriate levels of respiratory protection are employed at all times. Additionally, the testing will be performed to determine if changes to this plan are warranted to protect workers, the community and the environment.

7.1 Organic Compounds

When deemed appropriate, a member of the safety team will use a real-time, organic vapor analyzer to monitor the concentration VOCs in the air in the work areas, and will determine when changes in site operations and personal protection equipment are necessary. No changes in the levels of respiratory protection specified above will be made without the approval of the site safety supervisor and the project team leader.

During the environmental restoration activities, the site workers will use a photo ionization detector (PID) and/or a combustible gas indicator (CGI) to monitor levels of organic vapor in the air and verify that they are within the safety guidelines established by the preliminary assessment of the risks associated with site investigations. The PID has an audible alarm set for 5 ppm (the lowest action threshold presented within this plan). If used, the GCI will have an audible alarm set to detect explosive atmospheres. Testing will be performed as necessary within the exclusion zone and at the nearest down-wind property line to insure the protection of the surrounding community.

Screening activities with respect to soil quality are detailed in section 8 of this report. At a minimum, where monitoring equipment is used, the following information will be logged.

- Instrument type and detection range
- Control settings
- Reading locations
- Atmospheric conditions
- Calibration Records – To be performed a minimum of once per day

For health and safety purposes, the benzene concentration in air will be identified as 2% of the total concentration of detected hydrocarbons. This method is consistent with air monitoring conducted by the NYSDEC.

The data collected during monitoring will be used to guide site operations in a manner that is consistent with the New York State Department of Environmental Conservation, DER-10 Technical Guidance for Site Investigation and Remediation, Generic Community Air Monitoring Plan.

Accordingly, if the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average. **If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.**

7.2 Fugitive Emissions and Odor Monitoring

Airborne fugitive particulate emissions at the site EZ and at the nearest down wind property line will be measured by the Site Safety Officer on a continuous basis during waste handling activities. The measurements will be made using a portable particulate monitoring device manufactured by the Casella Corporation. The monitoring device is capable of detecting airborne particulate (PM-10) at concentrations ranging from 1 to 1000 micrograms per cubic meter (ug/m³). Detected concentrations are logged within the instrument memory and can be retrieved using Microsoft Windows-based software provided by the manufacturer. Retrieved data can be imported into standard PC-based spreadsheet and database software for analysis and report presentation.

At a minimum, where the particulate monitoring device is used, the following information will be logged.

- Instrument type and detection range
- Control settings
- Reading locations
- Atmospheric conditions
- Calibration Records – To be performed a minimum of once per day

The data collected during monitoring will be used to guide site operations in a manner that is consistent, or due to the presence of heavy metal contaminants within the soil is more restrictive than those presented within the New York State Department of Environmental Conservation, DER-10 Technical Guidance for Site Investigation and Remediation, Generic Community Air Monitoring Plan.

If **during handling or the historic fill** the total downwind PM-10 particulate level is 150 micrograms per cubic meter (ug/m³) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then the handling activities must immediately stop, and the dust suppression techniques listed in section 8.3 of this document must be employed. Activities cannot resume until the mitigating measures result in a net downwind PM-10 particulate concentration below 150 ug/m³.

If during **handling of certified clean soil** the total downwind PM-10 particulate level is 200 micrograms per cubic meter (ug/m³) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques listed in section 8.3 of this document must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 200 ug/m³ above the upwind level and provided that no visible dust is migrating from the work area.

If, after implementation of dust suppression techniques, downwind PM - 10 particulate levels are greater than 150 ug/m³ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 ug/m³ of the upwind level and in preventing visible dust migration.

Because the detection of odors is subjective, the Site Health and Safety Officer will be charged with the responsibility of making a determination if measures are required to abate odors. Since the contaminant concentrations in the soil/fill are generally below the odor threshold, the odor sources during the site will be the operation of diesel engines associated with hydraulic material handling and transportation.

7.3 Site Matrix for Protection Level Determinations

Action levels represent those conditions requiring an upgrade of personal protective equipment (PPE). The information presented below applies to the above chemical constituents. All air monitoring results should be logged in the Site Safety Log. The following tables provide for quick reference for each monitored parameter.

- *Ionization Detector Response*

Photoionization Detector (PID)	
Concentrations (in ppm)	Level of PPE Required/Procedure
0.0 to 15.0	Level D
15.1 to 250.0	Level C
> 750.0	Immediately withdraw from the area

- *Combustible Gas Response*

Combustible Gas Indicator (CGI)	
Results (% of LEL)	Level of PPE Required/Procedure
0.0 to 20.0	Level D - Continue with normal activity
Above 20.0	Discontinue all site restoration activities - Immediately withdraw from the area and implement emergency procedures presented in Section 11 of this document.

- *Particulate Detector Response*

Real Time Particulate Detection Meter	
Results (mg/m3)	Level of PPE Required/Procedure
0.0 to 5.0	Continue with normal activity – Level D
>5.0	Level C Protection - Discontinue site activities – initiate dust control activities listed in Section 8.3 of this document

7.4 Work Zone Definitions

Work and support areas shall be established based on ambient air data and proposed work sites. They shall be established in order to contain contamination within the smallest areas possible and shall ensure that each employee has the proper PPE for the area or zone in which work is to be performed.

7.4.1 Exclusion Zone (EZ)

It is within this zone that the excavation or environmental remediation activities such as tank abandonment operations (as described in 8.1.1.1) are performed. No one shall enter this zone unless the appropriate PPE is donned. The location of this zone will change as the construction-related excavation activities are performed.

7.4.2 Contaminant Reduction Zone (CRZ)

It is within this zone that the decontamination process is undertaken. Personnel and their equipment must be adequately decontaminated before leaving this zone for the support zone. This zone will be set up between the EZ (no less than 100 feet away) and the site boundary.

7.4.3 Support Zone (SZ)

The support zone is considered to be uncontaminated; as such, protective clothing and equipment are not required but should be available for use in emergencies. All equipment and materials are stored and maintained within this zone. Protective clothing is put on within the SZ before entering the EZ or the CRZ. The SZ will be established in a safe environment at least 50 feet away from the EZ.

7.4.4 Fugitive Dust Control Measures

To prevent the occurrence of fugitive emissions the following procedures will be implemented.

- ◆ A strict facility speed limit will be set at 15 miles per hour.
- ◆ Roads will be wetted using potable water.
- ◆ Media stockpiles over 500 cubic yards will be covered with plastic poly sheeting.
- ◆ Excavation and handling activities will be halted where winds exceed 40 miles per hour.
- ◆ Loading and mechanical screening of material will be performed within the central portions of the site as to provide maximum distance to the property lines.

- ◆ Media handled about the site will be covered while being transported within trucks.

7.5 Backfilling

All backfill material must be demonstrated to be free of any detectable concentrations of organic compounds and have concentrations of inorganic compounds that are consistent with uncontaminated regional soils (McGovern, NYSDEC, 1987).

8 General Safety and Health Provisions

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to general safety and health provisions. Rather, contractors, subcontractors and workers at the site must refer to OSHA's General Safety and Health Provision Standard, set forth at 29 C.F.R. § 1910 subparts C and G as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations.

8.1 Safety Practices / Standing Orders

The following are important safety precautions that will be enforced during work activities.

1. Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any area designated as contaminated.
2. Hands and face must be thoroughly washed upon leaving the work area and before eating, drinking, or any other activity.
3. Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as possible after the protective garments are removed.
4. No excessive facial hair that interferes with the effectiveness of a respirator will be permitted on personnel required to wear respiratory protection equipment. The respirator must seal against the face so that the wearer receives air only through the air purifying cartridges attached to the respirator. Fit testing shall be performed prior to respirator use to ensure the wearer obtains a proper seal.
5. Contact with potentially contaminated surfaces should be avoided whenever possible. One should not walk through puddles; kneel on the ground; lean, sit, or place equipment on drums, containers, vehicles, or the ground.
6. Medicine and alcohol can potentate the effect from exposure to certain compounds. Prescribed drugs and alcoholic beverages should not be consumed by personnel involved in the project.
7. Personnel and equipment in the work areas should be minimized, consistent with effective site operations.
8. Work areas for various operational activities should be established.

9. Procedures for leaving the work area must be planned and implemented prior to going to the site. Work areas and decontamination procedures must be established on the basis of prevailing site conditions.
10. Respirators will be issued for the exclusive use of one worker and will be cleaned and disinfected after each use.
11. Safety gloves and boots shall be taped to the disposable, chemical-protective suits as necessary.
12. All unsafe equipment left unattended will be identified by a "DANGER, DO NOT OPERATE" tag.
13. Noise mufflers or earplugs may be required for all site personnel working around heavy equipment. This requirement will be at the discretion of the Site Health and Safety Officer. Disposable, form-fitting plugs are preferred.
14. Cartridges for air-purifying respirators in use will be changed daily at a minimum.

8.2 Buddy System

Site personnel will employ the buddy system when working under certain circumstances, such as enclosed spacing. Under the buddy system, each site worker is responsible for monitoring the well-being of another worker. No one will work alone when the buddy system is implemented. At no time will fewer than two employees be present at the site if activities are underway.

8.3 Site Communications Plan

Mobile telephone and/or two-way radios will be used to communicate between the work parties on the site. The following standard hand signals will be used in case of failure of radio communication:

- Hands on top of head = Need assistance
- Thumbs up = OK, I am alright, I understand
- Thumbs down = No, negative

Personnel in the Contaminated Zone should remain in constant radio communication or within sight of the project team leader. Any failure of radio communication will require the team leader to evaluate whether personnel should leave the zone.

8.4 Retention of Records

The following records will be maintained on-site and in corporate records for no less than three years.

- Fit test results
- OSHA Training Certification
- Medical Questionnaire and/or Medical Clearance
- Medical Data Sheets
- Accident Report Forms

9 Decontamination Plan

9.1 General

Personnel involved in work activities at the site may be exposed to compounds in a number of ways, despite the most stringent protective procedures. Site personnel may come in contact with vapors, gases, mists, particulates in the air, or other site media while performing site duties. Use of monitoring instruments and site equipment can also result in exposure and transmittal of hazardous substances.

In general, decontamination involves scrubbing with a detergent water solution followed by clean water rinses. All disposable items shall be disposed of in a dry container. Certain parts of contaminated respirators, such as harness assemblies and leather or cloth components, are difficult to decontaminate. If grossly contaminated, they may have to be discarded. Rubber components can be soaked in detergent and water and scrubbed with a brush. In addition to being contaminated, all respirators, non-disposable protective clothing, and other personal articles must be sanitized or replaced before they can be used again if they become soiled from exhalation, body oils, and perspiration. The manufacturer's instructions should be followed in sanitizing the respirator masks.

The Site Health and Safety Officer will be responsible for the proper maintenance, decontamination, and sanitizing of any respirator equipment that may be used on-site.

The decontamination zone layout and procedures should match the prescribed levels of personal protection.

The following procedures have been established to provide site personnel with minimum guidelines for proper decontamination. Personnel leaving the point of operations designated as the EZ must follow these minimum procedures. The decontamination process shall take place within the contaminant reduction zone.

9.2 Minimum Decontamination Procedure

Personnel leaving the point of operations should remove or change outer gloves. At a minimum, boots shall be cleaned of all accumulated soil/fill. Outer boots must be properly washed where gross contamination is evident or disposed of. If Tyvek suits are being utilized, they should be removed or changed. Personnel should remove the Tyvek suits so that the inner clothing does not come in contact with any contaminated surfaces. After Tyvek removal, personnel shall remove and discard outer Nitrile gloves. Personnel shall then remove the respirator, where applicable. Respirators shall be disinfected between uses with towelettes or other sanitary methods. Potable water, at a minimum, will be present so that site personnel can thoroughly wash hands and face after leaving the point of operations.

The Site Health and Safety Officer will monitor decontamination procedures to ensure their effectiveness. Modifications of the decontamination procedure may be necessary as determined by the Site Health and Safety Officer's observations.

9.3 Standard Decontamination Procedure

The following decontamination procedures should be implemented during site operations for the appropriate level of protection.

9.3.1 Level B

Segregated equipment drop	Deposit equipment (tools, sampling devices, notes, monitoring instruments, radios, etc.) used on the site onto plastic drop cloths.
Boot covers and glove wash	Outer boots and outer gloves should be scrubbed with a decontamination solution of detergent and water or replaced.
Rinse off boot covers and gloves	Decontamination solution should be rinsed off boot covers and gloves using generous amounts of water. Repeat as many times as necessary.
Tape removal	Remove tape from around boots and gloves and place into container with plastic liner.
Boot cover removal	Remove disposable boot covers and place into container with plastic liner.
Outer glove removal	Remove outer gloves and deposit in container with plastic liner.
Suit / safety boot wash	Completely wash splash suit, SCBA, gloves, and safety boots. Care should be exercised that no water is allowed into the SCBA regulator. It is suggested that the SCBA regulator be wrapped in plastic.
Suit / safety boot rinse	Thoroughly rinse off all decontamination solution from protective

	clothing.
Tank or canister changes	This is the last step in the decontamination procedure for those workers wishing to change air tanks and return to the EZ. The worker's air tank or cartridge is exchanged, new outer glove and boot covers are donned, and joints taped.
Removal of safety boots	Remove safety boots and deposit in container with a plastic liner.
SCBA backpack removal	Without removing the face piece, the SCBA backpack should be removed and placed on a table. The face piece should then be disconnected from the remaining SCBA unit and then proceed to the next station.
Splash suit removal	With care, remove the splash suit. The exterior of the splash suit should not come in contact with any inner layers of clothing.
Inner glove wash	The inner gloves should be washed with a mild decontamination solution (detergent / water).
Inner glove rinse	Generously rinse the inner gloves with water.
Face piece removal	Without touching the face with gloves, remove the face piece. The face piece should be deposited into a container that has a plastic liner.
Inner glove removal	Remove the inner glove and deposit into a container that has a plastic liner.
Field wash	Wash hands and face thoroughly. If highly toxic, skin corrosive, or skin absorbent materials are known or suspected to be present, a shower should be taken.

9.3.2 Level C and Level D

The decontamination procedure for Level C and Level D will be satisfied with the Minimum procedures outlined in section 8.2.

9.4 Heavy Equipment and Handling Equipment Decontamination

Equipment traversing the site and exiting the site will be subjected to a decontamination protocol. At a minimum the protocol will consist of an inspection of the truck fenders, tires and mud flaps for accumulated soil/fill, and removal of all accumulations using hand tools (brush, broom and scrapers). If deemed necessary by the Health and Safety Officer, this inspection will be performed over a thirty by fifteen foot area that has been filled with ¾ inch crushed recycled concrete aggregate to facilitate the removal of soil/fill accumulations from the tires, and to immobilize soil/fill removed from the truck body. Additionally, all trucks hauling waste will be required to be covered prior to exiting the site.

At the conclusion of the use of each piece of excavation equipment on the site, it will be decontaminated with an Alconox / water solution followed by a clean water rinse within the Contaminant Reduction Zone. The rinsate will be allowed to charge into the site ground.

10 Emergency Response / Contingency Plan

10.1 Pre-Emergency Planning

In order to properly prepare for emergencies, Material Safety Data Sheets (MSDS) will be maintained on-site for the type of contaminants to which workers may be exposed. Based upon the results of previous investigations, these contaminants consist of a mixture of organic compounds consistent with those found within diesel and/or heating oil. The MSDS for both products are presented on the following pages.

In the event a suspected or known hazardous substance or substance container is encountered during site activities, a contingency plan will be triggered (see Section 11.3).

10.1.1 Zinc Material Safety Data Sheet

Section 1 Identification	
Product Number:	C2980
Product Name:	Zinc Metal Reagent Grade, Powder (dust)
Trade/Chemical Synonyms	
Formula:	Zn
RTECS:	ZG8600000
C.A.S	CAS# 7740-66-6
Health:	1
Flammability	2
Reactivity	1
Hazard Rating:	
Least Slight Moderate High Extreme	
0 1 2 3 4	
NA = Not Applicable NE = Not Established	

Section 2 Component Mixture					
Sara 313	Component	CAS Number	%	Dim	Exposure Limits:
<input type="checkbox"/>	Zinc Metal	CAS# 7740-66-6	100%	W/W	OSHA TWA 5 mg/mf

Section 3 Hazard Identification (Also see section 11)

Keep away from heat and ignition sources. Harmful if swallowed. Avoid breathing vapors. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed.

Section 4 First Aid Measures

Keep away from heat and ignition sources. Harmful if swallowed. Avoid breathing vapors. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed.

FIRST AID: CALL A PHYSICIAN. SKIN: Wash exposed area with soap and water.

EYES: Wash eyes with plenty of water for at least 15 minutes, lifting lids occasionally. Seek Medical Aid. INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen

INGESTION: If swallowed, induce vomiting immediately after giving two glasses of water. Never give anything by mouth to an unconscious person.

Section 5 Fire Fighting Measures

Fire Extinguisher Type: Smother with dry powder (i.e.: sand, sodium chloride, magnesium oxide).

Fire/Explosion Hazards: Dust, in moist air can generate sufficient heat to ignite the hydrogen gas released. Metal burns at high temperatures.

Fire Fighting Procedure: Avoid water. Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and clothing.

Section 6 Accidental Release Measures

Avoid water. Remove all sources of ignition. Ventilate area of leak or spill. Wear respiratory protection. Do not disperse dust into air. Use non-sparking tools to pick up and place in closed dry container.

Section 7 Handling and Storage

Store in a cool, dry, well-ventilated place away from incompatible materials. Wash thoroughly after handling.

Section 8 Exposure Controls & Personal Protection

Respiratory Protection: NIOSH/MSHA-approved respirator

Ventilation: Mechanical: Local Exhaust:

Hand Protection: NIOSH Approved Gloves

Eye Protection: Safety Glasses

Other Protective Equipment: Use safe laboratory handling procedures.

Section 9 Physical and Chemical Properties

Melting Point:	419° C	Specific Gravity	7.14
Boiling Point:	907° C	Percent Volatile by Volume:	N/A
Vapor Pressure:	N/A	Evaporation Rate:	N/A
Vapor Density:	N/A	Evaporation Standard:	
Solubility in Water:	Not soluble	Auto ignition Temperature:	460° C
Appearance and Odor:	Gray, blue matallic powder / no odor	Lower Flamm. Limit in Air:	N/E
Flash Point:	information not available	Upper Flamm. Limit in Air:	N/E

Section 10 Stability and Reactivity Information

Stability: Stable	Conditions to Avoid: Heat and moisture
Materials to Avoid:	
Hazardous Decomposition Products: Hydrogen gas, Zinc oxide fumes	
Hazardous Polymerization: Will Not Occur	
Condition to Avoid: None known	

Section 11 Additional Information

Conditions aggravated/Target organs: Persons with preexisting skin or respiratory disorders may be more susceptible. Acute: Irritation possible to skin, eyes, lungs, mucous membranes, and GI tract. If heated fumes may cause "zinc fume fever". Chronic: None known.		
DOT Classification: Zinc Dust, 4.3, UN1436, PG II		
DOT regulations may change from time to time. Please consult the most recent version of the relevant regulations.		
Revision No: 0	Date Entered: 9/1/2005	Approved by: WPF

10.1.2 Magnesium Material Safety Data Sheet

Section 1 Identification						
Product Number:	C2009			Health:	1	
Product Name:	Magnesium Laboratory Grade, Turnings			Flammability:	2	
Trade/Chemical Synonyms:				Reactivity:	2	
Formula:	Mg			Hazard Rating:		
RTECS:	OM2100000			Least Slight Moderate High Extreme		
C.A.S	CAS# 7439-95-4			0 1 2 3 4		
NA = Not Applicable NE = Not Established						
Section 2 Component Mixture						
Sara 313	Component	CAS Number	%	Dim	Exposure Limits:	
<input type="checkbox"/>	Magnesium	CAS# 7439-95-4	100%	W/W	None established	
Section 3 Hazard Identification (Also see section 11)						
Keep away from heat and ignition sources. Harmful if swallowed. Avoid breathing vapors. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed.						
Section 4 First Aid Measures						
Keep away from heat and ignition sources. Harmful if swallowed. Avoid breathing vapors. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed.						
FIRST AID: SKIN: Wash exposed area with soap and water. If irritation persists, seek medical attention.						
EYES: Wash eyes with plenty of water for at least 15 minutes, lifting lids occasionally. Seek Medical Aid. INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen						
INGESTION: If swallowed, induce vomiting immediately after giving two glasses of water. Never give anything by mouth to an unconscious person.						
Section 5 Fire Fighting Measures						
Fire Extinguisher Type: Melting flux/dry sand &/or metal exting pwdr. DO NOT USE WATER!						
Fire/Explosion Hazards: Dangerous in the form of dust or flakes. When heated in air to near melting point, may ignite and burn.						
Fire Fighting Procedure: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and clothing.						
Section 6 Accidental Release Measures						
Remove all sources of ignition wear protective equipment. Clean up in a manner that doesn't disperse dust. Sweep up and containerize for later reclamation.						
Section 7 Handling and Storage						
Store in a cool, dry, well-ventilated place away from incompatible materials. Wash thoroughly after handling.						
Section 8 Exposure Controls & Personal Protection						
Respiratory Protection:NIOSH/MSHA-approved respirator						
Ventilation:	Mechanical:	<input type="checkbox"/>	Hand Protection: Wear appropriate gloves to prevent skin exposure			
	Local Exhaust:	<input checked="" type="checkbox"/>	Eye Protection: Face Shield and chem worker goggles			
Other Protective Equipment: Wear appropriate clothing to prevent skin exposure						

Section 9 Physical and Chemical Properties

Melting Point:	649 ° C	Specific Gravity	1.74
Boiling Point:	1110° C	Percent Volatile by Volume:	N/A
Vapor Pressure:	1mm@621°	Evaporation Rate:	N/A
Vapor Density:	information not available	Evaporation Standard:	
Solubility in Water:	Not soluble	Auto ignition Temperature:	Not applicable
Appearance and Odor:	Silver solid, odorless	Lower Flamm. Limit in Air:	Not applicable
Flash Point:	Not known	Upper Flamm. Limit in Air:	Not applicable

Section 10 Stability and Reactivity Information

Stability: Stable Conditions to Avoid: Moisture, Incompatible substances

Materials to Avoid:
Oxides, carbonates, cyanides, chlorinated hydrocarbons

Hazardous Decomposition Products:
Fire produces toxic fumes and vapors

Hazardous Polymerization: Will Not Occur

Condition to Avoid: None known

Section 11 Additional Information

Inhalation of dust may irritate respiratory tract and may cause coughing, chest pain, and fever. Ingestion may cause stomach pain and diarrhea. Particles imbedded in the skin may cause eruptions. Molten magnesium may cause serious burns. Conditions aggravated/target organs: Persons with pre-existing eye, skin, or respiratory conditions may be more susceptible.

DOT Classification: Magnesium Turnings, 4.1, UN1869, PG III

DOT regulations may change from time to time. Please consult the most recent version of the relevant regulations.

Revision No:1

Date Entered: 9/1/2005

Approved by: WPF

10.1.3 Copper Material Safety Data Sheet

Section 1 Identification						
Product Number:	C1610				Health:	1
Product Name:	Copper Reagent A.C.S., Granular				Flammability	0
Trade/Chemical Synonyms					Reactivity	0
Formula:	Cu				Hazard Rating:	
RTECS:	GL5325000				Least Slight Moderate High Extreme	
C.A.S	CAS# 7440-50-8				0 1 2 3 4	
						NA = Not Applicable NE = Not Established
Section 2 Component Mixture						
Sara 313	Component	CAS Number	%	Dim	Exposure Limits:	
<input checked="" type="checkbox"/>	Copper	CAS# 7440-50-8	100%	W/W	OSHA TWA 1 mg (Cu)/mf (dust, mist)	
Section 3 Hazard Identification (Also see section 11)						
Generally not hazardous in normal handling, however good laboratory practices should always be used. Avoid long term exposure to skin or by inhalation.						
Section 4 First Aid Measures						
Generally not hazardous in normal handling, however good laboratory practices should always be used. Avoid long term exposure to skin or by inhalation.						
FIRST AID: SKIN: Wash exposed area with soap and water. If irritation persists, seek medical attention.						
EYES: Wash eyes with plenty of water for at least 15 minutes, lifting lids occasionally. Seek Medical Aid. INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen						
INGESTION: Give several glasses of milk or water. Vomiting may occur spontaneously, but it is not necessary to induce. Never give anything by mouth to an unconscious person.						
Section 5 Fire Fighting Measures						
Fire Extinguisher Type: Any means suitable for extinguishing surrounding fire						
Fire/Explosion Hazards: None Known.						
Fire Fighting Procedure: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and clothing.						
Section 6 Accidental Release Measures						
Sweep up and place in suitable (fiberboard) containers for reclamation or later disposal.						
Section 7 Handling and Storage						
Store in a cool dry place. This Material is not considered hazardous. Handle using safe laboratory practices.						
Section 8 Exposure Controls & Personal Protection						
Respiratory Protection: None required						
Ventilation:	Mechanical:	<input type="checkbox"/>	Hand Protection: Wear appropriate gloves to prevent skin exposure			
	Local Exhaust:	<input checked="" type="checkbox"/>	Eye Protection: Splash Goggles			
Other Protective Equipment: Wear appropriate clothing to prevent skin exposure						

Section 9 Physical and Chemical Properties

Melting Point:	1083°C	Specific Gravity	8.94
Boiling Point:	2595°C	Percent Volatile by Volume:	N/A
Vapor Pressure:	1 mm Hg @1628°C	Evaporation Rate:	N/A
Vapor Density:	N/A	Evaporation Standard:	
Solubility in Water:	Insoluble	Auto ignition Temperature:	Not applicable
Appearance and Odor:	Reddish, lusterous metal	Lower Flamm. Limit in Air:	Not applicable
Flash Point:	N/A	Upper Flamm. Limit in Air:	Not applicable

Section 10 Stability and Reactivity Information

Stability: Stable Conditions to Avoid: Avoid contact with incompatible materials.
Materials to Avoid:
Acetylene, magnesium metal (as copper dust)
Hazardous Decomposition Products:
None
Hazardous Polymerization: Will Not Occur
Condition to Avoid: None known

Section 11 Additional Information

Can irritate eyes, mucous membranes, and pharynx. Can cause nausea, ulcer perforation, metal taste and dermatitis. Conditions aggravated/target organs: Persons with pre-existing eye, skin, or respiratory conditions may be more susceptible

DOT Classification: Not Regulated

DOT regulations may change from time to time. Please consult the most recent version of the relevant regulations.

Revision No: 0.1

Date Entered: 9/1/2005

Approved by: WPF

10.1.4 Cadmium Material Safety Data Sheet

Section 1 Identification						
Product Number:	C1407				Health:	2
Product Name:	Cadmium Chloride Reagent A.C.S., Crystal				Flammability	0
Trade/Chemical Synonyms					Reactivity	0
Formula:	CdCl ₂ · 1/2 H ₂ O				Hazard Rating:	
RTECS:	EV0178000				Least Slight Moderate High Extreme	
C.A.S	CAS# 7790-78-5				0 1 2 3 4	
						NA = Not Applicable NE = Not Established
Section 2 Component Mixture						
Sara 313	Component	CAS Number	%	Dim	Exposure Limits:	
<input checked="" type="checkbox"/>	Cadmium Chloride	CAS# 7790-78-5	100%	W/W	OSHA TWA 0.2 mg/mf (Cd)	
Section 3 Hazard Identification (Also see section 11)						
May be fatal if inhaled, swallowed or absorbed thru the skin Avoid all contact. Use with adequate ventilation. Wash thoroughly after use. Keep container closed.						
Section 4 First Aid Measures						
May be fatal if inhaled, swallowed or absorbed thru the skin Avoid all contact. Use with adequate ventilation. Wash thoroughly after use. Keep container closed.						
FIRST AID: SKIN: Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention						
EYES: Wash eyes with plenty of water for at least 15 minutes, lifting lids occasionally. Seek Medical Aid. INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen						
INGESTION: If swallowed, induce vomiting immediately after giving two glasses of water. Never give anything by mouth to an unconscious person.						
Section 5 Fire Fighting Measures						
Fire Extinguisher Type: Any means suitable for extinguishing surrounding fire						
Fire/Explosion Hazards: Thermal decomposition produces highly toxic fumes.						
Fire Fighting Procedure: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and clothing.						
Section 6 Accidental Release Measures						
Evacuate area. Wear self-contained breathing apparatus and protective clothing. Eliminate all sources of ignition.						
Section 7 Handling and Storage						
Store in a cool, dry, well-ventilated place away from incompatible materials. Wash thoroughly after handling.						
Section 8 Exposure Controls & Personal Protection						
Respiratory Protection: NIOSH/MSHA-approved respirator						
Ventilation:	Mechanical:	<input checked="" type="checkbox"/>	Hand Protection: NIOSH Approved Gloves			
	Local Exhaust:	<input checked="" type="checkbox"/>	Eye Protection: Splash Goggles			
Other Protective Equipment: Wear appropriate clothing to prevent skin exposure						

10.1.5 Diesel Engine Oil Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: N9000 DIESEL ENGINE OIL
SUPPLIER: EXXON MOBIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037
24 - Hour Health and Safety Emergency (call collect): 609-737-4411
24 - Hour Transportation Emergency (Primary) CHEMTREC: 800-424-9300
(Secondary) 281-834-3296
Product and Technical Information: 800-443-9966
MSDS Fax on Demand: 613-228-1467, other MSDS information: 856-224-4644

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: BASE OIL AND ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

Substance Name	Approx. Wt%
----------------	-------------

-----	-----
-------	-------

CALCIUM ALKYLENE PHENATE	1-5
--------------------------	-----

SULFIDE CARBONATE

(OVERBASED) (122384-87-6)

CALCIUM LONG-CHAIN ALKARYL	1-5
----------------------------	-----

SULFONATES (LOW OVERBASED)

(156619-82-8)

3. HAZARDS IDENTIFICATION

Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).

EMERGENCY OVERVIEW: Clear Dark Amber Liquid. DOT ERG No. : NA

POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.

For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.

SKIN CONTACT: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area. (See Section 16 - Injection Injury)

INHALATION: Not expected to be a problem. However, if respiratory irritation, dizziness, nausea, or unconsciousness occurs due to excessive vapor or mist exposure, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or mouth-to-mouth resuscitation.

INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing.

Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

Flash Point C(F): 204(400) (ASTM D-92).

Flammable Limits (approx.% vol.in air) - LEL: 0.9%, UEL: 7.0%

NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:

LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.

WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.

PERSONAL PRECAUTIONS: See Section 8

7. HANDLING AND STORAGE

HANDLING: No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.

SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.

EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

When mists/aerosols can occur, the following are recommended: 5 mg/m³ (as oil mist)- ACGIH Threshold Limit Value (TLV), 10 mg/m³ (as oil mist) - ACGIH Short Term Exposure Limit (STEL), 5 mg/m³ (as oil mist) - OSHA Permissible Exposure Limit (PEL)

VENTILATION: If mists are generated, use adequate ventilation, local exhaust or enclosures to control below exposure limits.

RESPIRATORY PROTECTION: If mists are generated, and/or when ventilation is not adequate, wear approved respirator.

EYE PROTECTION: If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.

SKIN PROTECTION: Not normally required. When splashing or liquid contact can occur frequently, wear oil resistant gloves and/or other protective clothing. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Liquid

COLOR: Clear Dark Amber

ODOR: Mild

ODOR THRESHOLD-ppm: NE

pH: NA

BOILING POINT C(F): > 391(735)

MELTING POINT C(F): NA

FLASH POINT C(F): 204(400) (ASTM D-92)

FLAMMABILITY (solids): NE

AUTO FLAMMABILITY C(F): NA

EXPLOSIVE PROPERTIES: NA

OXIDIZING PROPERTIES: NA

VAPOR PRESSURE-mmHg 20 C: NE

VAPOR DENSITY: NE

EVAPORATION RATE: NE

RELATIVE DENSITY, 15/4 C: 0.89

SOLUBILITY IN WATER: Negligible

PARTITION COEFFICIENT: > 3.5

VISCOSITY AT 40 C, cSt: > 100.0

VISCOSITY AT 100 C, cSt: > 10.0
POUR POINT C(F): -12(10)
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES
FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.
EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.
SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.
OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral and synthetic oils, such as those in this product, have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---

Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. Overexposure to oil mist may result in oil droplet deposition and/or granuloma formation. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-346, and/or other analytical methods. For synthetic base oils: The base oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---

Not expected to be sensitizing based on tests of this product, components, or similar products.

---OTHER TOXICOLOGY DATA---

Used gasoline engine oils have shown evidence of skin carcinogenic activity in laboratory tests when no effort was made to wash the oil off between applications. Used oil from diesel engines did not produce this effect.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS: This product is expected to be inherently biodegradable. Bioaccumulation is unlikely due to the very low water solubility of this product, therefore bioavailability to aquatic organisms is minimal. Available ecotoxicity data (LL50 >1000 mg/L) indicates that adverse effects to aquatic organisms are not expected from this product. When released into the environment, adsorption to sediment and soil will be the predominant behavior.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.
RID/ADR: NOT REGULATED BY RID/ADR.
IMO: NOT REGULATED BY IMO.
IATA: NOT REGULATED BY IATA.
STATIC ACCUMULATOR (50 picosiemens or less): YES

15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.
EU Labeling: Product is not dangerous as defined by the European Union Dangerous Substances/Preparations Directives. EU labeling not required.
Governmental Inventory Status: All components comply with TSCA.
U.S. Superfund Amendments and Reauthorization Act (SARA) Title III: This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".
SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

16. OTHER INFORMATION

USE: COMMERCIAL ENGINE OIL
NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INDUSTRIAL LABEL

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.

For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN: 7312229-00, CMCS97: 97P835, REQ: PS+C, SAFE USE: L
EHS Approval Date: 30SEP2001

10.1.6 Lead-Free Gasoline; No-lead Gasoline – Gasoline, Unleaded Material Safety Data Sheet

NSN: 9130012084172
Manufacturer's CAGE: 8P539
Part No. Indicator: A
Part Number/Trade Name: LEAD-FREE GASOLINE; NO-LEAD GASOLINE

=====
General Information
=====

Item Name: GASOLINE, UNLEADED

Date MSDS Prepared: 23FEB90
Safety Data Review Date: 21OCT94
Supply Item Manager: KY
MSDS Serial Number: BVHJT
Specification Number: VV-G-1690
Spec Type, Grade, Class: CIVGAS
Hazard Characteristic Code: F2
Unit Of Issue: DR
Unit Of Issue Container Qty: 55 GALLONS
Type Of Container: DRUM, 18 GAGE
Net Unit Weight: 325.2 LBS

=====
Ingredients/Identity Information
=====

Proprietary: NO
Ingredient: HYDROCARBONS, AROMATIC
Ingredient Sequence Number: 01
Percent: 15-35
NIOSH (RTECS) Number: 1008732HA
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO
Ingredient: SATURATED HYDROCARBONS
Ingredient Sequence Number: 02
Percent: 60-75
NIOSH (RTECS) Number: 1006886SH
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO
Ingredient: UNSATURATED HYDROCARBONS
Ingredient Sequence Number: 03
Percent: 1-15
NIOSH (RTECS) Number: 1006887UH
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO
Ingredient: DYE AND OTHER ADDITIVES
Ingredient Sequence Number: 04
Percent: 0.02
NIOSH (RTECS) Number: 1003746AD
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NONE RECOMMENDED
=====

Physical/Chemical Characteristics

=====

Appearance And Odor: BLUE OR CLEAR, TYPICAL HYDROCARBON ODOR.
Boiling Point: 90.0F,32.2C
Vapor Pressure (MM Hg/70 F): 414 @100C
Vapor Density (Air=1): 3-4
Specific Gravity: 0.71-0.77
Solubility In Water: NEGLIGIBLE.
=====

Fire and Explosion Hazard Data

=====

Flash Point: -50F,-46C
Flash Point Method: TCC
Lower Explosive Limit: 1.3
Upper Explosive Limit: 6
Extinguishing Media: ANY UL APPROVED CLASS B MEDIA SUCH AS FOAM, CARBON DIOXIDE, DRY CHEMICAL.
Special Fire Fighting Proc: NONE SPECIFIED BY MFG; HOWEVER USE APPROPRIATE PROTECTIVE EQPMT INCLUDING SELF-CONTAINED BREATHING APPARATUS.
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MFG; HOWEVER MATL IS HEAVIER THAN AIR AND WILL TRAVEL LONG DISTANCES & FLASHBACK. EXPLOSIVE MIXTURE FORMS W/GASOLINE & AIR.
=====

Reactivity Data

=====

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MFG; HOWEVER AVOID OPEN FLAMES/HEAT/SPARKS/OTHER IGNITION SOURCES.
Materials To Avoid: OXIDIZERS.
Hazardous Decomp Products: NONE SPECIFIED BY MFG.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT.
=====

Health Hazard Data

=====

LD50-LC50 Mixture: UNKNOWN
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE:EYE:IRRIT @ HIGH VAP LEVELS OR DIRECT CONTACT W/FLUID. SKIN:IRRIT ON PROLONG CONTACT W/LIQ, DERM RESULTING FROM DEFATTING NATURE OF LIQ. SYSTEMATIC:CNS EFFECTS (NARCOSIS) @ HIGH VAP LEVELS; MUC MEMBRANE IRRIT, PNEUMONIA. INGEST:GASTROINTESTINAL

DISTRUBANCES. CHRONIC:PERIPERAL NERVOUS SY EFFECTS, BLOOD ALTERATIONS

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: YES

Carcinogenicity - OSHA: NO

Explanation Carcinogenicity: PER MSDS:NONE STATED; HOWEVER CONTAINS GASOLINE WHICH IS CONSIDERED BY IARC TO BE POTENTIAL CARCINOGEN.

Signs/Symptoms Of Overexp: EYE & SKIN IRRITATION. DERMATITIS. NARCOSIS. GI DISTURBANCES:NAUSEA, DIARRHEA, STOMACH PAINS.

Med Cond Aggravated By Exp: NONE SPECIFIED BY MFG.

THOROUGHLY WASH AREA W/SOAP & WATER. INHAL:REMOVE FROM CONTAMINATED AREA.

ADMINISTER ARTIFICIAL RESP IF NECESSARY. CALL PHYSICIAN. INGEST:GIVE A VEGETABLE OIL TO RETARD ABSORPTION. DO NOT INDUCE VOMITING. CALL PHYSICIAN.

FATAL DOSE ADULT HUMAN APPROX 350G, CHILD APPROX 10-13G.

=====

Precautions for Safe Handling and Use

=====

Steps If Matl Released/Spill: KEEP PUBLIC AWAY. SHUT OFF SOURCE W/O RISK. ADVISE POLICE & NAT RESP CENTER 800-424-8802 IF SUBSTANCE HAS ENTERED A WATER COURSE OR SEWER. CONTAIN LIQ W/EARTH, SAND. RECOVER FREE LIQ BY PPUMPING OR W/SUITABLE ABSORBENT.

Neutralizing Agent: NONE SPECIFIED BY MFG.

Waste Disposal Method: UNDER MANY SPILL SITUATIONS LIQ CAN BE RECOVERED & RECLAIMED. WHERE SOLID ABSORBENTS ARE USED THEY SHOULD BE INCINERATED PER APPLICABLE STATE & LOCAL REGULATIONS.

Precautions-Handling/Storing: USE APPROPRIATE GROUNDING-DISPENSING PROCEDURES. STORE IN RELATIVELY COOL PLACE. DO NOT EXPOSE TO HEAT, OPEN FLAME OR OXIDANTS.

Other Precautions: NONE SPECIFIED BY MFG.

=====

Control Measures

=====

Respiratory Protection: FOR EXPOSURES IN EXCESS OF EXPOSURE LIMITS CHEMICAL CARTRIDGE RESPIRATOR OR AIR SUPPLIED EQUIPMENT.

Ventilation: LOCAL EXHAUST REQUIRED & EXPLOSION PROOF EQUIPMENT.

Protective Gloves: IMPERMEABLE GLOVES.

Eye Protection: NONE SPECIFIED HOWEVER SAF GLASSES/GOGG

Other Protective Equipment: NONE SPEICFIED BY MFG.

Work Hygienic Practices: WASH HANDS AFTER HANDLING & PRIOR TO EAT/DRINK/ SMOKE/USE OF TOILET FACILITIES. FOLLOW GOOD WORK HYGIENE PRACTICES.

=====

Transportation Data

=====

Trans Data Review Date: 94294

DOT PSN Code: GTN

DOT Proper Shipping Name: GASOLINE

DOT Class: 3

DOT ID Number: UN1203

DOT Pack Group: II

DOT Label: FLAMMABLE LIQUID

IMO PSN Code: HRV

IMO Proper Shipping Name: GASOLINE

IMO Regulations Page Number: 3141

IMO UN Number: 1203

IMO UN Class: 3.1
IMO Subsidiary Risk Label: -
IATA PSN Code: MUC
IATA UN ID Number: 1203
IATA Proper Shipping Name: GASOLINE
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFI PSN Code: MUC

====

Label Required: YES
Technical Review Date: 21OCT94
Label Status: F
Common Name: LEAD-FREE GASOLINE; NO-LEAD GASOLINE
Signal Word: DANGER!
Acute Health Hazard-Moderate: X
Contact Hazard-Moderate: X
Fire Hazard-Severe: X
Reactivity Hazard-None: X
Special Hazard Precautions: ACUTE:EYE:IRRIT @ HIGH VAP LEVELS OR DIRECT CONTACT W/FLUID. SKIN:IRRIT ON PROLONG CONTACT W/LIQ, DERM RESULTING FROM DEFATTING NATURE OF LIQ. SYSTEMATIC:CNS EFFECTS (NARCOSIS) @ HIGH VAP LEVELS; MUC MEMBRANE IRRIT, PNEUMONIA. INGEST:GASTROINTESTINAL DISTRUBANCES. CHRONIC:PERIPHERAL NERVOUS SYS EFFECTS, BLOOD ALTERATIONS. 1ST AID:EYE:FLUSH FOR @ LEAST 15MINS W/WATER. SKIN:THOROUGHLY WASH AREA W/ SOAP & WATER. INHAL:REMOVE FROM CONTAMINATED AREA. ADMINISTER ARTIFICIAL RESP IF NECESSARY. CALL PHYSICIAN. INGEST:GIVE A VEGETABLE OIL TO RETARD ABSORPTION. DO NOT INDUCE VOMITING. CALL PHYSICIAN. FATAL DOSE ADULT HUMAN APPROX 350G, CHILD APPROX 10-13G.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: BELL FUELS, INC
Label Street: 4116 WEST PATERSON AVE
Label City: CHICAGO
Label State: IL
Label Zip Code: 60646
Label Country: US
Label Emergency Number: 312-286-0200

10.1.7 Lead Material Safety Data Sheet

SECTION 1. GENERAL INFORMATION

FREE ELEMENTAL LEAD; LEAD SALTS

SECTION 2. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Ingredient	Approximate Percent by Weight	C.A.S. Number	Occupational Exposure Limits (OELs)	LD ₅₀ /LC ₅₀ Species and Route
Lead	99+%	7439-92-1	OSHA PEL 0.05mg/m ³ ACGIH TLV 0.05mg/m ³ NIOSH REL <0.10mg/m ³	No Data

NOTE: OELs for individual jurisdictions may differ from OSHA PELs. Check with local authorities for the applicable OELs in your jurisdiction. OSHA - Occupational Safety and Health Administration; ACGIH - American Conference of Governmental Industrial Hygienists; NIOSH - National Institute for Occupational Safety and Health. OEL - Occupational Exposure Limit, PEL - Permissible Exposure Limit, TLV - Threshold Limit Value, REL - Recommended Exposure Limit.

Trade Names and Synonyms: Lead; Pb; Plumbum; Metallic Lead; Inorganic Lead; ASTM B29; TADANAC Lead, Low-Alpha Lead.

SECTION 3. HAZARDS IDENTIFICATION

Emergency Overview: A bluish-white to silvery-grey heavy, soft metal that does not burn in bulk. Finely-divided lead dust clouds are a moderate fire hazard and moderate explosion hazard, however. When heated in air highly toxic lead oxide fumes can be generated. Inhalation or ingestion of lead may produce both acute and chronic health effects. Possible cancer and reproductive hazard. SCBA and full protective clothing required for fire emergency response personnel.

Potential Health Effects: Inhalation or ingestion of lead dust or fumes may result in headache, nausea, vomiting, abdominal spasms, fatigue, sleep disturbances, weight loss, anemia and leg, arm, and joint pain. Prolonged exposure may also cause central nervous system damage (e.g., fatigue, headaches, tremors, hypertension), gastrointestinal disturbances, anemia, kidney dysfunction and possible reproductive effects. Pregnant women should be protected from excessive exposure to prevent lead crossing the placental barrier and causing infant neurological disorders. Lead is classified as an A3 Carcinogen by the ACGIH and as a 2B Carcinogen by IARC. (see Toxicological Information, Section 11)

Potential Environmental Effects: Lead metal has low bioavailability but its compounds can be hazardous in the environment at low concentrations. They can be particularly toxic in the aquatic environment. Lead bioaccumulates in plants and animals in both the aquatic and terrestrial environments. (see Ecological Information, Section 12)

EU Risk Phrase(s): R61 - May cause harm to unborn child; R62 - Possible risk of impaired fertility; R20/22 - Harmful by inhalation and if swallowed; R33 - Danger of cumulative effects.

SECTION 4. FIRST AID MEASURES

Eye Contact: Flush with warm, running water, including under the eyelids, to remove dust particle(s). If irritation persists seek medical attention.

Skin Contact: *Dust:* Remove contaminated clothing and wash affected area with soap and warm water. Launder contaminated clothing before reuse. Seek medical attention if irritation develops or persists. *Molten Metal:* Flush contact area to solidify and cool but do not attempt to remove encrusted material or clothing. Cover burns and seek medical attention immediately.

Inhalation: Remove victim from exposure area to fresh air immediately. If breathing has stopped, give artificial respiration. Keep affected person warm and at rest. Medical oxygen may be administered, if available, where breathing is difficult. Seek immediate medical attention.

Ingestion: If victim is conscious and can swallow, dilute stomach contents with 2-4 cupfuls of water or milk. Do not induce vomiting. Seek medical attention and bring a copy of this MSDS. Never give anything by mouth to an unconscious person.

SECTION 5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Massive metal is not flammable or combustible. Finely-divided lead dust or powder is a moderate fire hazard and moderate explosion hazard when dispersed in the air at high concentrations and exposed to heat, flame, or incandescents. Explosions may also occur upon contact with certain incompatible materials (see Stability and Reactivity, Section 10).

Extinguishing Media: Use any means of extinction appropriate for surrounding fire conditions such as water spray, carbon dioxide, dry chemical, or foam.

Fire Fighting: If possible, move material from fire area and cool material exposed to flame. Highly toxic lead oxide fumes may evolve in fires. Fire fighters must be fully trained and wear full protective clothing including an approved, self-contained breathing apparatus which supplies a positive air pressure within a full face-piece mask.

Flashpoint and Method: Not Applicable.

Upper and Lower Flammable Limit: Not Applicable.

Autoignition Temperature: Not Applicable.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Procedures for Cleanup: Control source of spillage if possible to do so safely. Restrict access to the area until completion of clean-up. Clean up spilled material immediately, observing precautions in Section 8, Personal Protection. Molten metal should be allowed to solidify before cleanup. If solid metal, wear gloves, pick up and return to process. If dust, wear recommended personal protective equipment (see Section 8) and use methods which will minimize dust generation (e.g., vacuum solids). Return uncontaminated spilled material to the process if possible. Place contaminated material in suitable labeled containers for recovery or disposal. Treat or dispose of waste material in accordance with all local, regional, and national requirements.

Personal Precautions: Persons responding to an accidental release should wear protective clothing, gloves and a respirator (see also Section 8). Close-fitting safety goggles may be necessary in some circumstances to prevent eye contact with dust and fume. Where molten metal is involved, wear heat-resistant gloves and suitable clothing for protection from hot metal splash as well as a respirator to protect against inhalation of lead fume. Workers should wash and change clothing following cleanup of a lead spill to prevent personal contamination with lead dust.

Environmental Precautions: Lead metal has limited bioavailability but its compounds can pose a severe threat to the aquatic and terrestrial environments. Contamination of water and soil should be prevented.

SECTION 7. HANDLING AND STORAGE

Store in a dry, covered area away from incompatible materials, strong acids and food or feedstuffs. Solid metal suspected of containing moisture should be THOROUGHLY DRIED before being added to a molten bath. Otherwise, entrained moisture

could expand explosively and spatter molten metal out of the bath. Always practice good personal hygiene. Refrain from eating, drinking, or smoking in work areas. Thoroughly wash hands before eating, drinking, or smoking in appropriate, designated areas as well as at the end of the workday. No special packaging materials are required.

EU Safety Phrase(s): S53 - Avoid exposure - obtain special instructions before use; S45 – In case of accident, or if you feel unwell, seek medical advice immediately (show label where possible).

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Protective Clothing: Gloves and coveralls or other work clothing are recommended to prevent prolonged or repeated direct skin contact when lead is processed. Appropriate eye protection should be worn where fume or dust is generated. Where hot or molten metal is handled, heat resistant gloves, goggles or face shield, and clothing to protect from hot metal splash should be worn. Safety type boots are recommended.

Do not eat, drink or smoke in work areas. Thoroughly wash hands before eating, drinking, or smoking in appropriate, designated areas as well as at the end of the workday. A double locker-shower system with separate clean and dirty sides is usually required for lead handling operations. Remove contaminated clothing promptly and discard or launder before reuse. Inform laundry personnel of contaminants' hazards.

Ventilation: Use adequate local or general ventilation to maintain the concentration of lead fumes in the working environment well below recommended occupational exposure limits. Supply sufficient replacement air to make up for air removed by the exhaust system. Local exhaust is recommended for melting, casting, grinding, burning, and use of powders.

Respirators: Where lead dust or fumes are generated and cannot be controlled to within acceptable levels by engineering means, use appropriate NIOSH-approved respiratory protection equipment (a 42CFR84 Class N, R or P-100 particulate filter cartridge). When exposure levels are unknown, a self-contained breathing apparatus which supplies a positive air pressure within a full face-piece mask should be worn.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Malleable, bluish-white or silvery-grey metal	Odour: None	Physical State: Solid	pH: Not Applicable
Vapour Pressure: 1.3 mm Hg at 970°C (negligible @ 20°C)	Vapour Density: Not Applicable	Boiling Point/Range: 1,740°C	Freezing/Melting Point/Range: 328°C
Specific Gravity: 11.34	Evaporation Rate: Not Applicable	Coefficient of Water/Oil Distribution: Not Applicable	Odour Threshold: None
Solubility: Insoluble in water			

SECTION 10. STABILITY AND REACTIVITY

Stability & Reactivity: Massive metal is stable under normal temperatures and pressures. Fresh cut or cast lead surfaces tarnish rapidly due to the formation of an insoluble protective layer of basic lead carbonate.

Incompatibilities: Lead reacts vigorously with strong oxidizers, such as hydrogen peroxide and chlorine trifluoride, and active metals, such as sodium and potassium. Powdered lead metal in contact with disodium acetylide, chlorine trifluoride, sodium carbide or fused ammonium nitrate poses a risk of explosion. Solutions of sodium azide in contact with lead metal can form lead azide, which is a detonating compound. A lead-zirconium alloy (10-70% Zr) will ignite when struck with a hammer.

Hazardous Decomposition Products: High temperature operations such as oxy-acetylene cutting, electric arc welding or overheating a molten bath will generate highly toxic lead oxide fume. Lead oxide is highly soluble in body fluids and the particle size of the metal fumes is largely within the respirable size range, which increases the likelihood of inhalation and deposition of the fume within the body.

SECTION 11. TOXICOLOGICAL INFORMATION

General: Lead accumulates in bone and body organs once it enters the body. Elimination from the body is slow. Initial and periodic medical examinations are advised for persons repeatedly exposed to levels above the exposure limits of lead dust or

fumes. Once lead enters the body, it can affect a variety of organ systems, including the nervous system, kidneys, reproductive system, blood formation, and gastrointestinal system. The primary routes of exposure to lead are inhalation or ingestion of dust and fumes.

Acute:

Skin/Eye: Contact with dust or fume may cause local irritation but would not cause tissue damage.

Inhalation: Exposure to lead dust or fume may cause headache, nausea, vomiting, abdominal spasms, fatigue, sleep disturbances, weight loss, anemia, and pain in legs, arms, and joints. An acute, short-term dose of lead could cause acute encephalopathy with seizures, coma, and death. However, short-term exposure of this magnitude is rare. Kidney damage, as well as anemia, can occur from acute exposure.

Ingestion: Symptoms due to ingestion of lead dust or fume would be similar to those from inhalation. Other health effects such as metallic taste in the mouth and constipation or bloody diarrhea might also be expected to occur.

Chronic:

Prolonged exposure to lead dust and fume may produce many of the symptoms of short-term exposure and may also cause central nervous system damage, gastrointestinal disturbances, anemia, and, rarely, wrist drop. Reduced hemoglobin production has been associated with low lead exposures. Symptoms of central nervous system damage due to moderate lead exposure include fatigue, headaches, tremors and hypertension. Very high lead exposure can result in lead encephalopathy with symptoms of hallucinations, convulsions, and delirium. Kidney dysfunction and possible injury has also been associated with chronic lead poisoning. Chronic over-exposure to lead has been implicated as a causative agency for the impairment of male and female reproductive capacity. Pregnant women should be protected from excessive exposure as lead can cross the placental barrier and unborn children may suffer neurological damage or developmental problems due to excessive lead exposure in pregnant women. Teratogenic and mutagenic effects from exposure to lead have been reported in some studies but not in others. The literature is inconsistent and no firm conclusions can be drawn at this time. Lead and lead compounds are listed as an A3 Carcinogen (Confirmed Animal Carcinogen with Unknown Relevance to Humans) by the ACGIH and as a Group 2B Carcinogen (possibly carcinogenic to humans) by IARC. The NTP, OSHA and the EU do not currently list lead as a human carcinogen.

SECTION 12. ECOLOGICAL INFORMATION

While lead metal is insoluble, its processing or extended exposure in the aquatic and terrestrial environments may lead to the release of lead in bioavailable forms. Lead compounds are not particularly mobile in the aquatic environment but can be toxic to organisms, especially fish, at low concentrations. Water hardness, pH and dissolved organic carbon content are factors which regulate the degree of toxicity. In soil, lead is generally not very mobile or bioavailable as it can become strongly sorbed on soil particles, increasingly so over time, to a degree dependent on soil properties. Lead bioaccumulates in plants and animals in both the terrestrial and aquatic environments.

SECTION 13. DISPOSAL CONSIDERATIONS

If material cannot be returned to process or salvage, dispose of in accordance with applicable regulations.

SECTION 14. TRANSPORT INFORMATION

PROPER SHIPPING NAMENot a regulated product in ingot form.
TRANSPORT CANADA AND U.S. DOT CLASSIFICATIONNot Applicable
TRANSPORT CANADA AND U.S. DOT PINNot Applicable
MARINE POLLUTANTNo
IMO CLASSIFICATIONNot Regulated

SECTION 15. REGULATORY INFORMATION

U.S.

Ingredient Listed on TSCA Inventory.....Yes

Hazardous Under Hazard Communication Standard.....Yes

CERCLA Section 103 Hazardous SubstancesLead RQ: 10 lbs. (4.54 kg.)*
*reporting not required when diameter of the pieces of solid metal released is equal to or exceeds 100 micrometers (0.004 inches).

EPCRA Section 302 Extremely Hazardous Substance.....No

Disclaimer:

Impact Environmental Consulting, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. IMPACT ENVIRONMENTAL CONSULTING, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, IMPACT ENVIRONMENTAL CONSULTING, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

I. GENERAL INFORMATION

Trade Name: Arsenic **Formula:** As
Chemical Family: Metallic element **CAS #:** 7440-38-2

2. HAZARDOUS INGREDIENTS

Hazardous Components % OSHA/PEL ACGIH/TLV Sec. 313
Arsenic 0-100 10 ug/m³ 0.01 mg/m³ Yes

3. PHYSICAL DATA

Boiling Point: 613 °C (Sublimes) **Melting Point:** 817 °C
Vapor Density (Air=1): N/A **Vapor Pressure:** 1mm @ 372 °C
Solubility in H₂O: Insoluble % **Volatiles:** 0
Appearance and Odor: Steel-grey brittle solid, no odor. **Specific gravity (H₂O=1):** 5.72gm/cc

4. FIRE AND EXPLOSION HAZARD DATA

Flash Point: N/A **Autoignition Temp:** N/A
Flammability: Lower: N/A **Upper:** N/A

Extinguishing Media: Do not use water. Use carbon dioxide, dry chemical extinguishing agents, dry sand, dry ground dolomite.

Special Firefighting Procedures: Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in fire.

Unusual Fire and Explosion Hazard: Slight explosion hazard in the form of a dust when exposed to flame. Moderate fire hazard in the form of dust when exposed to heat or flame or by chemical reaction.

5. HEALTH HAZARD INFORMATION

Effects of Exposure:

Acute arsenic poisoning (from ingestion) results in marked irritation of the stomach and intestines with nausea, vomiting and diarrhea. In severe cases the vomitus and stools are bloody and the patient goes

into collapse and shock with weak, rapid pulse, cold sweats, coma and death. Chronic arsenic poisoning, whether through ingestion or inhalation, may manifest itself in many different ways. There may be disturbances of the digestive system such as loss of appetite, cramps, nausea, constipation or diarrhea. Liver damage may occur, resulting in jaundice. Disturbances of the blood, kidneys and nervous system are not infrequent. Arsenic can cause a variety of skin abnormalities including itching, pigmentation and even cancerous changes. A characteristic of arsenic poisoning is the great variety of symptoms that can be produced. A recognized carcinogen of the skin, lungs, liver. An experimental carcinogen of the mouth, esophagus, larynx, bladder and para nasal sinus. (Sax, Dangerous Properties of Industrial Materials)

Acute Effects:

Inhalation: Causes irritation of mucous membranes and respiratory tract, metallic taste, pharyngitis, bloody nose, perforation of the nasal septum.

Ingestion: May cause vomiting, diarrhea and nausea.

Skin: Causes moderate irritation, skin sensitization.

Eye: Causes moderate irritation.

Chronic Effects:

Inhalation: May cause cancer (skin and lung).

Ingestion: May cause cancer (skin and lung).

Skin: Can cause eczematous dermatitis, pigmentation, hyperkeratosis.

Eye: None known

Other Health Hazards: There is evidence that arsenic may cross the placental barrier. Arsenic is a neurotoxin. Poisoning may affect the heart, GI system, kidneys and liver.

Routes of Entry: Inhalation, ingestion.

Medical Conditions Generally Aggravated by Exposure: No data

Carcinogenicity: NTP: Yes IARC: Yes OSHA: Yes

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: No specific information available, one should obtain medical attention.

INGESTION: No data available but one should obtain medical attention.

SKIN: Remove contaminated clothing, flood skin with large amounts of water. If irritation persists seek medical attention.

EYE: Immediately flush eyes, including under eyelids, with large amounts of water for at least 15 minutes. Call a physician.

6. REACTIVITY DATA

Stability: Stable

Conditions to Avoid: Incompatibles, exposure to air.

Incompatibility (Materials to Avoid): Acids, acid fumes, oxidizing agents, halogens, heat, palladium, zinc, platinum, nitrogen trichloride, silver nitrate, acetylenes, chlorosylamine, chromium (VI) oxide, sodium peroxide, dirubidium acetylde.

Hazardous Decomposition Products: At temperatures above the melting point, metal oxide fumes may be evolved. Under reducing conditions (i.e. any strong acid or base plus an active metal) or in the presence of nascent hydrogen, highly toxic arsine gas may be evolved.

Hazardous Polymerization: Will not occur.

7. SPILL OR LEAK PROCEDURES

Steps to Be Taken in Case Material Is Released or Spilled: Any method which keeps dust to a minimum is acceptable. Vacuuming is preferred for dust. Use approved respiratory protection if possibility of dust/fume exposure exists. Do not use compressed air for cleaning.

Waste Disposal Method: Dispose of in accordance with all State, Federal and Local regulations.

8. SPECIAL PROTECTION INFORMATION

Respiratory Protection: Where airborne exposures may exceed OSHA/ACGIH permissible air concentrations, the minimum respiratory protection recommended is a negative pressure air purifying respirator with cartridges that are NIOSH/MSHA approved against dust, fumes and mists having a TWA less than 0.05 mg/m³.

Ventilation: Glove bag or box preferred.

Protective Gloves: Rubber

Eye/Face Protection: ANSI approved safety goggles with a full face shield.

Other Protective Equipment: Full protective clothing, lab coat and apron, flame and chemical resistant coveralls, is recommended for exposures that exceed permissible air concentrations. All contaminated clothing should be removed before leaving plant premises.

9. SPECIAL PRECAUTIONS

Precautions to Be Taken in Handling and Storage: Use of approved respirators is required for applications where adequate ventilation cannot be provided. Activities which generate dust or fume should be avoided. When melted, the temperature should be kept as low as possible. Keep container tightly closed. Store in a cool, dry, well-ventilated area. Wash thoroughly after use.

Work Practices: Avoid inhalation or ingestion. Practice good housekeeping and personal hygiene procedures. No tobacco or food in the work area. Wash thoroughly before eating or smoking. Shower and change clothes at end of work shift. Do not wear contaminated clothing home. Do not blow dust off clothing with compressed air. Maintain eyewash capable of sustained flushing, safety drench shower and hygienic facilities for washing.

Danger: Poison, causes skin and lung cancer.

The above information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. ESPI shall not be held liable for any damage resulting from handling or from contact with the above product.

10.1.9 Selenium Material Safety Data Sheet

Section 1 Identification			
Product Number:	C2450	Health:	2
Product Name:	Selenium Metal 99.5% Powder	Flammability	1
Trade/Chemical Synonyms		Reactivity	0
Formula:	Se	Hazard Rating:	
RTECS:	VS7700000	Least Slight Moderate High Extreme	
C.A.S	CAS# 7782-49-2	0 1 2 3 4	
		NA = Not Applicable NE = Not Established	

Section 2 Component Mixture					
Sara 313	Component	CAS Number	%	Dim	Exposure Limits:
<input checked="" type="checkbox"/>	Selenium Metal 99.5%	CAS# 7782-49-2	100%	W/W	OSHA TWA 0.2 mg/mf

Section 3 Hazard Identification (Also see section 11)
 May be fatal if inhaled, swallowed or absorbed thru the skin Avoid all contact. Use with adequate ventilation. Wash thoroughly after use. Keep container closed.

Section 4 First Aid Measures
 May be fatal if inhaled, swallowed or absorbed thru the skin Avoid all contact. Use with adequate ventilation. Wash thoroughly after use. Keep container closed.
 FIRST AID: SKIN: Wash exposed area with soap and water. If irritation persists, seek medical attention.
 EYES: Wash eyes with plenty of water for at least 15 minutes, lifting lids occasionally. Seek Medical Aid.
 INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen
 INGESTION: If swallowed, induce vomiting immediately after giving two glasses of water. Never give anything by mouth to an unconscious person.

Section 5 Fire Fighting Measures

Fire Extinguisher Type:	Dry chemical powder or appropriate foam. Do not use water jet.
Fire/Explosion Hazards:	May be combustible at high temperature. Emits TOXIC fumes under fire conditions.
Fire Fighting Procedure:	Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and clothing.

Section 6 Accidental Release Measures

Evacuate area. Wear self-contained breathing apparatus and protective clothing. Eliminate all sources of ignition.

Section 7 Handling and Storage

Store in a cool dry well ventilated area. Keep away from heat and flame. Do not get in eyes, on skin, or on clothing. Keep tightly closed.

Section 8 Exposure Controls & Personal Protection

Respiratory Protection:NIOSH/MSHA-approved respirator

Ventilation: Mechanical: Hand Protection: Wear appropriate gloves to prevent skin exposure
Local Exhaust: Eye Protection: Splash Goggles

Other Protective Equipment: Wear appropriate clothing to prevent skin exposure. Impervious clothing to prevent exposure.

Section 9 Physical and Chemical Properties

Melting Point:	217°C	Specific Gravity	4.810
Boiling Point:	690°C	Percent Volatile by Volume:	0
Vapor Pressure:	Not available	Evaporation Rate:	Not available
Vapor Density:	Not available	Evaporation Standard:	Not available
Solubility in Water:	insoluble	Auto ignition Temperature:	Not applicable
Appearance and Odor:	odorless metallic powder	Lower Flamm. Limit in Air:	Not available
Flash Point:	Not available	Upper Flamm. Limit in Air:	Not available

Section 10 Stability and Reactivity Information

Stability: yes Conditions to Avoid: vapors and heat.

Materials to Avoid:

Oxidizing materials,and acids

Hazardous Decomposition Products:

TOXIC fumes.

Hazardous Polymerization:Will Not Occur

Condition to Avoid:None known

Section 11 Additional Information

DANGER!! Vapors if inhaled or absorbed through the skin can be POISONIOUS!! Effects of over exposure:lung irritation and dermatitis. Acute: Dust is TOXIC . HARMFUL if swallowed. Stomach pains,vomiting, diarrhea, coughing and chest pains, difficulty in breathing. Chronic: none are specified by manufacturer. Target organs: upper respiratory tract and eyes. Conditions aggravated/target organs. Persons with pre-existing eye,skin or respiratory conditions may be more susceptible.

DOT Classification: Selenium compounds n.o.s. (Selenium powder), 6.1, UN3283, PG III

DOT regulations may change from time to time. Please consult the most recent version of the relevant regulations.

Revision No:0.1

Date Entered: 9/1/2006

Approved by: WPF

10.1.10 Nickel Material Safety Data Sheet

Section 1 Identification			
Product Number:	C2156	Health:	3
Product Name:	Nickel Metal Laboratory Grade, Shot	Flammability	0
Trade/Chemical Synonyms		Reactivity	0
Formula:	Ni	Hazard Rating:	
RTECS:	QR5950000	Least Slight Moderate High Extreme	
C.A.S	CAS# 7440-02-0	0 1 2 3 4	
		NA = Not Applicable NE = Not Established	

Section 2 Component Mixture					
Sara 313	Component	CAS Number	%	Dim	Exposure Limits:
<input checked="" type="checkbox"/>	Nickel Metal	CAS# 7440-02-0	100	W/W	OSHA TWA 1 mg/mf

Section 3 Hazard Identification (Also see section 11)

May be fatal if inhaled, swallowed or absorbed thru the skin Avoid all contact. Use with adequate ventilation. Wash thoroughly after use. Keep container closed.

Section 4 First Aid Measures

May be fatal if inhaled, swallowed or absorbed thru the skin Avoid all contact. Use with adequate ventilation. Wash thoroughly after use. Keep container closed.

FIRST AID: CALL A PHYSICIAN. SKIN: Remove contaminated clothing. Wash exposed area with soap and water.

EYES: Wash eyes with plenty of water for at least 15 minutes, lifting lids occasionally. Seek Medical Aid.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen

INGESTION: If swallowed, induce vomiting immediately after giving two glasses of water. Never give anything by mouth to an unconscious person.

Section 5 Fire Fighting Measures

Fire Extinguisher Type:	Use agents for metal, such as graphite
Fire/Explosion Hazards:	Dust at sufficient concentrations can form explosive mixtures with air.
Fire Fighting Procedure:	Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and clothing.

Section 6 Accidental Release Measures

Evacuate area. Wear self-contained breathing apparatus and protective clothing. Eliminate all sources of ignition.

Section 7 Handling and Storage

Store in a cool, dry, well-ventilated place away from incompatible materials. Wash thoroughly after handling.

Section 8 Exposure Controls & Personal Protection

Respiratory Protection: NIOSH/MSHA-approved respirator

Ventilation: Mechanical: Hand Protection: NIOSH Approved Gloves
Local Exhaust: Eye Protection: Splash Goggles

Other Protective Equipment: Wear appropriate clothing to prevent skin exposure

Section 9 Physical and Chemical Properties

Melting Point:	1455° C	Specific Gravity	8.9
Boiling Point:	2732° C	Percent Volatile by Volume:	N/A
Vapor Pressure:	1 @ 1810° C	Evaporation Rate:	N/A
Vapor Density:	N/A	Evaporation Standard:	
Solubility in Water:	Insoluble	Auto ignition Temperature:	Not applicable
Appearance and Odor:	Silvery white metallic powder	Lower Flamm. Limit in Air:	Not applicable
Flash Point:	N/A	Upper Flamm. Limit in Air:	Not applicable

Section 10 Stability and Reactivity Information

Stability: Stable Conditions to Avoid: Avoid contact with incompatible materials.
Materials to Avoid:
mineral acids, strong oxidizers
Hazardous Decomposition Products:
Hydrogen gas
Hazardous Polymerization: Will Not Occur
Condition to Avoid: None known

Section 11 Additional Information

Dust may irritate eyes skin and respiratory tract. Conditions aggravated: Athsma, emphysema, etc. Persons with pre-existing eye, skin or respiratory conditions may be more susceptible.

DOT Classification: Not Regulated

DOT regulations may change from time to time. Please consult the most recent version of the relevant regulations.

Revision No:0 Date Entered: 9/1/2006 Approved by: WPF

10.1.11 Chromium Material Safety Data Sheet

Section 1 Identification			
Product Number:	C1503	Health:	2
Product Name:	Chromium	Flammability	1
Trade/Chemical Synonyms		Reactivity	0
Formula:	Cr	Hazard Rating:	
RTECS:	GB4200000	Least Slight Moderate High Extreme	
C.A.S	CAS# 7440-47-3	0 1 2 3 4	
		NA = Not Applicable NE = Not Established	

Section 2 Component Mixture					
Sara 313	Component	CAS Number	%	Dim	Exposure Limits:
<input checked="" type="checkbox"/>	Chromium	CAS# 7440-47-3	100%	w/w	OSHA TWA 1 mg/mf

Section 3 Hazard Identification (Also see section 11)

May be harmful if swallowed. May cause irritation. Avoid breathing vapors, or dusts. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed.

Section 4 First Aid Measures

May be harmful if swallowed. May cause irritation. Avoid breathing vapors, or dusts. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed.

FIRST AID: SKIN: Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention

EYES: Wash eyes with plenty of water for at least 15 minutes, lifting lids occasionally. Seek Medical Aid.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen

INGESTION: If swallowed, induce vomiting immediately after giving two glasses of water. Never give anything by mouth to an unconscious person.

Section 5 Fire Fighting Measures

Fire Extinguisher Type: Carbon Dioxide, dry chemical or sand. Do not disturb burning metal while extinguishing the fire.

Fire/Explosion Hazards: Dust at sufficient concentrations can form explosive mixtures with air.

Fire Fighting Procedure: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and clothing.

Section 6 Accidental Release Measures

Sweep up and place in suitable (fiberboard) containers for reclamation or later disposal.

Section 7 Handling and Storage

Precautions such as the use of inert atmosphere are advisable when sizing material to minus 100 mesh and when 50% is minus 200 mesh

Section 8 Exposure Controls & Personal Protection

Respiratory Protection: NIOSH/MSHA-approved respirator

Ventilation: Mechanical: Hand Protection: NIOSH Approved Gloves
Local Exhaust: Eye Protection: Splash Goggles

Other Protective Equipment: Wear appropriate clothing to prevent skin exposure

Section 9 Physical and Chemical Properties

Melting Point: 3326 Deg. F Specific Gravity 7.14
Boiling Point: 3992 Deg. F Percent Volatile by Volume: N/A
Vapor Pressure: N/A Evaporation Rate: N/A
Vapor Density: N/A Evaporation Standard:
Solubility in Water: Not soluble Auto ignition Temperature: Not applicable
Appearance and Odor: Lower Flamm. Limit in Air: Not applicable
Flash Point: N/A Upper Flamm. Limit in Air: Not applicable

Section 10 Stability and Reactivity Information

Stability: Stable Conditions to Avoid: Avoid contact with incompatible materials.
Materials to Avoid:
Acidic conditions
Hazardous Decomposition Products:
Not known to occur
Hazardous Polymerization: Will Not Occur
Condition to Avoid: None known

Section 11 Additional Information

Overexposure to dust may irritate eyes, nose or throat. Conditions aggravated/target organs. Persons with pre-existing eye, skin or respiratory conditions may be more susceptible.

DOT Classification: Not Regulated

DOT regulations may change from time to time. Please consult the most recent version of the relevant regulations.

Revision No:0 Date Entered: 9/1/2006 Approved by: WPF

10.1.12 Calcium Material Safety Data Sheet

Section 1 Identification			
Product Number:	C1411	Health:	3
Product Name:	Calcium Metal Reagent Grade	Flammability	3
Trade/Chemical Synonyms		Reactivity	2
Formula:	Ca	Hazard Rating:	
RTECS:	EV8040000	Least Slight Moderate High Extreme	
C.A.S	CAS# 7440-70-2	0	1 2 3 4
		NA = Not Applicable NE = Not Established	

Section 2 Component Mixture					
Sara 313	Component	CAS Number	%	Dim	Exposure Limits:
<input type="checkbox"/>	Calcium Metal	CAS# 7440-70-2	100 %	W/W	None established

Section 3 Hazard Identification (Also see section 11)

Keep away from heat and ignition sources. Harmful if swallowed. Avoid breathing vapors. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed.

Section 4 First Aid Measures

Keep away from heat and ignition sources. Harmful if swallowed. Avoid breathing vapors. Use with adequate ventilation. Avoid contact with eyes, skin, and clothes. Wash thoroughly after handling. Keep container closed.

FIRST AID: CALL A PHYSICIAN. SKIN: In case of contact, immediately flush skin with water for at least 15 minutes while removing contaminated clothing and shoes. Thoroughly clean clothing and shoes before reuse.

EYES: Wash eyes with plenty of water for at least 15 minutes, lifting lids occasionally. Seek Medical Aid.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen

INGESTION: Give several glasses of milk or water. Vomiting may occur spontaneously, but DO NOT INDUCE! Never give anything by mouth to an unconscious person.

Section 5 Fire Fighting Measures

Fire Extinguisher Type:	G-1 powder, Pyrene, Dry lime(not limestone)
Fire/Explosion Hazards:	Evolves hydrogen gas when heated or in contact with acids, moisture. Finely divided calcium is considered pyrophoric and will explode if ignited.

Fire Fighting Procedure:	Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and clothing.
--------------------------	--

Section 6 Accidental Release Measures

Collect spilled material for reclamation or disposal in sealed containers.

Section 7 Handling and Storage

Store in a cool dry well ventilated area. Keep away from heat and flame. Do not get in eyes, on skin, or on clothing.

Section 8 Exposure Controls & Personal Protection

Respiratory Protection: NIOSH/MSHA-approved respirator

Ventilation: Mechanical: Hand Protection: Wear appropriate gloves to prevent skin exposure
 Local Exhaust: Eye Protection: Goggles and Face Shield

Other Protective Equipment: Wear appropriate clothing to prevent skin exposure

Section 9 Physical and Chemical Properties

Melting Point:	Information not available	Specific Gravity	1.55
Boiling Point:	2817 Deg F	Percent Volatile by Volume:	0
Vapor Pressure:	0	Evaporation Rate:	0
Vapor Density:	Information not available	Evaporation Standard:	
Solubility in Water:	Reacts with water	Auto ignition Temperature:	Not applicable
Appearance and Odor:	Gray metallic solid, no odor	Lower Flamm. Limit in Air:	Not applicable
Flash Point:	None	Upper Flamm. Limit in Air:	Not applicable

Section 10 Stability and Reactivity Information

Stability: Stable Conditions to Avoid: Product is unstable when exposed to water. Moisture, water, high temperatures, sparks, and open flames

Materials to Avoid:
 Water, Alkali metal hydroxides and carbonates, acids.

Hazardous Decomposition Products:
 Hydrogen and calcium hydroxide.

Hazardous Polymerization: Will Not Occur

Condition to Avoid: None known

Section 11 Additional Information

Contact with skin while moist or perspired may cause burns due to reactions. Eye contact can cause irritation. If inhaled can cause irritation to mucous membranes. If ingested can cause burns of mouth and esophagus. If comes in contact with skin or eyes wash with water. If inhaled remove to fresh air. If ingested, Do not induce vomiting. For all above situation get medical assistance immediately. Persons with pre-existing disorders may be more

susceptible		
DOT Classification: Calcium, 4.3, UN1401, PG II		
DOT regulations may change from time to time. Please consult the most recent version of the relevant regulations.		
Revision No:0	Date Entered: 9/1/2006	Approved by: WPF

10.1.13 Beryllium Material Safety Data Sheet

===== Product Identification =====

Product ID:BERYLLIUM
MSDS Date:12/01/1992
FSC:6810
NIIN:00N045484
MSDS Number: CDMRJ

=== Responsible Party ===

Company Name:BRUSH WELLMAN INC
Address:14710 W PORTAGE RIVER S RD
City:ELMORE
State:OH
ZIP:43416-9502
Country:US
Info Phone Num:419-862-2745
Emergency Phone Num:419-862-2745;800-424-9300(CHEMTREC)
CAGE:4B151

=== Contractor Identification ===

Company Name:BRUSH WELLMAN INC.
Address:14710 W PORTAGE RIVER S ROAD
Box:City:ELMORE
State:OH
ZIP:43416-9502
Country:US
Phone:800-862-4118; -4177 (FAX)
CAGE:4B151

===== Composition/Information on Ingredients =====

Ingred Name:HNDLG/STOR PROC: EFFICIENCY PARTICULATE AIR (HEPA) FILTERS ARE RECOMD TYPE. AVOID USE OF COMPRESSED AIR TO REMOVE DUSTS.

Ingred Name:OTHER PRECS: PROTECTION, DECONTAMINATION, SPECIAL PROTECTIVE CLOTHING & WHEN NECESSARY, RESTRICTED WORK ZONES.

Inged Name:VENT: FUME TO MEET ESTABLISHED OCCUPATIONAL EXPOSURE LIMITS.

Inged Name:OTHER PROT EQUIP:TO PROTECT FROM MOLTEN METAL SPLASH. PROT OVERGARMENTS/WORK CLTHG FOR DUST/PWDR. MANAGE CONTAMD(ING 22)

Inged Name:ING 21:CLTHG IN MANNER SO AS TO PVNT SECONDARY EXPOS & TO PVNT PERSONAL CLTHG CONTAM. NEVER USE COMPRESSED AIR TO CLEAN.

Inged Name:HYGIENE PRACT: FREQUENCY & TYPE OF AIR SAMPLING SHOULD BE AS SPECIFIED BY QUALIFIED PROFESSIONAL & RSLTS SHOULD (ING 24)

Inged Name:ING 23: BE MADE AVAIL TO EMPLOYEES. PERIODIC LUNG FUNC TEST, CHEST X-RAYS & PHYSICAL EXAMS SHOULD BE USED TO (ING 25)

Inged Name:ING 24: MONITOR THE POTENTIAL EFFECTS OF DUST OR FUME EXPOSURE.

Inged Name:EFTS OF OVEREXP: SECONDARY EFFECTS ON THE HEART WITH EVENTUAL PERMANENT IMPAIRMENT.

Inged Name:MED CNDTNS: TO THE NEUROLOGIC (NERVOUS), CIRCULATORY, HEMATOLOGIC (BLOOD) OR URINARY (KIDNEY) SYS HAS OCCURRED, (ING 6)

Inged Name:ING 5: PROPER SCREENING/EXAMS SHOULD BE CONDUCTED ON INDIVIDUALS WHO MAY BE EXPOS TO FURTHER RISK WHERE HNDLG & (ING 7)

Inged Name:ING 6: USE OF THIS MATERIAL MAY CAUSE EXCESSIVE EXPOSURE.

Inged Name:FIRST AID PROC: W/DUST OR PWDR CAN BE REMOVED BY WASHING W/SOAP & WATER. IF IRRIT PERSISTS OBTAIN MED HELP. (ING 9)

Inged Name:ING 8: ACCIDENTAL IMPLANTATION BENEATH THE SKIN REQS IT BE REMOVED TO PVNT INFECTION OR DEVELOPMENT OF A CORN- (ING 10)

Inged Name:ING 9: LESION. EYES: DUST/POWDER SHOULD BE FLUSHED FROM EYES W/COPIOUS AMTS OF CLEAN WATER FOR AT LEAST 15 MIN. (ING 11)

Inged Name:ING 10: IF IRRIT PERSISTS OBTAIN MED HELP. CONTACT LENSES SHOULD NOT BE WORN.

Inged Name:SPILL PROC: UTILIZING A HIGH EFFICIENCY PARTICULAR AIR FILTRATION SYS FOLLOWED BY WET CLEANING METHS. SPEC CARE (ING 13)

Inged Name:ING 12: MUST BE TAKEN WHEN CHANGING FILTERS ON HEPA VACUUM CLEANERS WHEN USED TO CLEAN UP POTNTLY TOX MATLS. (ING 14)

Inged Name:ING 13: CAUTION SHOULD BE TAKEN TO MINIMIZE AIRBORNE GENERATION OF POWDER/DUST & AVOID CONTAM OF AIR & WATER. (ING 15)

Inged Name:ING 14: THE US EPA HAS CLASSIFIED BERYLLIUM DUST (P015) AS HAZ WASTE UNDER RCRA 40 CFR 261.33(E).

Ingred Name:WASTE DISP METH: APPRVD FOR FLAM SOLIDS. OUTER CNTNR MUST BE LABELED W/APPROP EPA HAZ WASTE LABEL & DOT HAZ (ING 17)

Ingred Name:ING 16: WARNING LABEL(S) & SHIPPED UNDER UNIFORM HAZ WASTE MANIFEST TO APPRVD HAZ WASTE MANAGEMENT FACILITY.

=====
===== Hazards Identification =====

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Routes of Entry: Inhalation: YES Skin: YES Ingestion: YES

Reports of Carcinogenicity: NTP: YES IARC:YES OSHA:NO

Health Hazards Acute and Chronic: ACUTE:PROD IS INSOL & DOES NOT CAUSE ACUTE HLTH EFTS. SKIN ABRASION MAY CAUSE IRRIT. EYES: INJURY CAN RSLT FROM PARTICULATE IRRIT OR MECH INJURY TO CORNEA/CONJ BY DUST/PARTICULATE. CHRONIC: OVEREXP TO AIRBORNE BERYLLIUM PARTICULATE MAY CAUSE SERIOUS LUNG DISEASE IN CERTAIN INDIVIDUALS CALLED CHRONIC (EFTS OF OVEREXP)

Explanation of Carcinogenicity: BERYLLIUM: IARC MONOGRAPHS, SUPP, VOL 7, PG 127, 1987: GROUP 1. NTP 7TH ANNUAL RPT ON CARCINS, 1994: ANTIC TO BE CARCIN.

Effects of Overexposure:HLTH HAZ: BERYLLIUM DISEASE (CHRONIC BERYLLIOSIS). THIS IS A CNDTN IN WHICH TISS OF LUNGS BECOME INFLAMED, RESTRICTING EXCHANGE OF OXYGEN BETWEEN LUNGS & BLOODSTREAM. SYMPS MAY INCL COUGH, CHEST PAIN, SHORTNESS OF BRTH, WT LOSS, WEAK & FATG. LONG-TERM EFTS MAY INCL LOSS OF LUNG FUNC, FIBROSIS OR SUBSEQUENT (ING 4)

Medical Cond Aggravated by Exposure:PERS W/IMPAIRED PULM FUNC, AIRWAY DISEASES OR CNDTNS SUCH AS ASTHMA, EMPHYSEMA, CHRONIC BRONCH, ETC MAY INCUR FURTHER IMPAIRMENT IF EXCESS CONCS OF DUST/FUME ARE INHALED. IF PRIOR DMG/DISEASE (ING 5)

=====
===== First Aid Measures =====

First Aid:INHAL:BRTHG DFCLTY CAUSED BY INHAL OF DUST/FUME REQS IMMED REMOVAL TO FRESH AIR. ALTHOUGH NO CASES IN WHICH PERSON STOPPED BRTHG AS RSLT OF EXPOS ARE KNOWN, IF BRTHG HAS STOPPED, PERFORM ARTF RESP & O BTAIN MED HELP. INGEST: HAVE AFFECTED PERSON DRINK LG QTYS OF WATER & TRY TO INDUCE VOMIT IF CONSCIOUS. OBTAIN MED HELP. SKIN: CUTS & ABRASIONS CAN BE TREATED BY STD FIRST AID. SKIN CONTAM (ING 8)

=====
===== Fire Fighting Measures =====

Extinguishing Media:SPEC FIRE PROBLEM ONLY IN PWDR/OTHER FINELY DIVIDED FORM. TO EXTING A METAL PWDR FIRE, USE CLASS D FIRE EXTING PWDR.

Fire Fighting Procedures:USE NIOSH APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT .

Unusual Fire/Explosion Hazard:DO NOT USE WATER TO EXTING FIRES AROUND OPERATIONS INVOLVING MOLTEN METAL DUE TO POTNTL FOR STEAM EXPLO. IN ADDN, WATER MAY DISASSOCIATE WHEN IN CNTCT (SUPDAT)

===== Accidental Release Measures =====

Spill Release Procedures:IN SOLID FORM, POSES NO HLTH/ENVIRONMENT RISK.
IF IN PWDR/DUST FORM, ESTABLISH RESTRICTED ENTRY ZONE BASED ON SEV
OF SPILL. PERS ENTERING ZONE MUST WEAR ADEQ NIOSH APPRVD RESP PROT
& APPROP PROT CLTHG . CLEANUP SHOULD BE CONDUCTED W/VACUUM SYS(ING
12)

Neutralizing Agent:NONE SPECIFIED BY MANUFACTURER.

===== Handling and Storage =====

Handling and Storage Precautions:VACUUM/WET CLEANING METHS RECOMD FOR
DUST REMOVAL. BE SURE TO DEENERGIZE ELEC SYS AS NEC BEFORE
BEGINNING WET CLEANING. VACUUM CLEANERS W/HIGH(ING 18)

Other Precautions:DURING REPAIR/MAINT ACTIVITIES POTNTL EXISTS FOR
EXPOS TO BERYLLIUM IN EXCESS OF OCCUP STD. UNDER THESE
CIRCUMSTANCES, PROTECTING WORKERS CAN REQ USE OF SPECIFIC WORK
PRACTS/PROCS INVOLVING COMBINED U SE OF VENT, WET METHS, RESP (ING
19)

===== Exposure Controls/Personal Protection =====

Respiratory Protection:USE NIOSH APPROVED RESPIRATOR APPROPRIATE FOR
EXPOSURE OF CONCERN . FOR MORE INFORMATION CONCERNING SPECIFIC
TYPES OF RESPIRATORS RECOMMENDED, CONTACT NEHC .

Ventilation:WHENEVER POSS USE OF LOC EXHST VENT/OTHER ENGINEERING CTLs
IS PREF METH OF CONTROLLING EXPOS TO AIRBORNE DUST & (ING 20)

Protective Gloves:IMPERVIOUS GLOVES .

Eye Protection:ANSI APPRVD CHEM WORKERS GOGGLES .

Other Protective Equipment:ANSI APPRVD EYE WASH & DELUGE SHOWER . PROT
CLTHG IE FIRE RETARDANT & MOLTEN METAL SPLASH RESIST GARMENTS(ING
21)

Work Hygienic Practices:EXPOS TO BERYLLIUM SHOULD BE DETERMD BY HAVING
AIR SAMPLES TAKEN IN EMPLOYEE BRTHG ZONE, WORK AREA &
DEPARTMENT.(ING 23)

Supplemental Safety and Health

EXPLO HAZ:W/BURNING BERYLLIUM PWDR/CHIPS RELS FLAM HYDROGEN GAS; COULD
BURN & RSLT IN EXPLO. VENT DUCT WORK WHICH HAS ACCUMD FINE COATING
OF BERYLLIUM DUST ON ITS INTERNAL SURF POSES POTNTLY SERIOUS F IRE
HAZ. EXTING USING CLASS D FIRE EXTING MEDIA & SHUT DOWN OR ISOLATE
AFFECTED PORTION OF VENT SYS. BECAUSE OF (ING 2)

===== Physical/Chemical Properties =====

Boiling Pt:B.P. Text:5378F,2970C

Melt/Freeze Pt:M.P/F.P Text:2345F,1285C

Spec Gravity:1.85

Solubility in Water:NONE

Appearance and Odor:GRAY METALLIC SOLID; NO ODOR.

Percent Volatiles by Volume:NONE

===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid: YES

AVOID CONTACT WITH MINERAL ACIDS & OXIDIZING AGENTS WHICH MAY GENERATE HYDROGEN GAS. HYDROGEN GAS CAN BE AN EXPLOSION HAZARD.

Stability Condition to Avoid: NONE SPECIFIED BY MANUFACTURER.

Hazardous Decomposition Products: MELTING & PROPER HANDLING OF POWDERING OPERATIONS CAN EMIT AIRBORNE DUSTS/FUMES. REFER TO INGREDIENTS FOR PERMISSIBLE EXPOSURE LIMIT.

===== Disposal Considerations =====

Waste Disposal Methods: DISPOSE MUST BE IN ACCORDANCE WITH FEDERAL, STATE & LOCAL REGULATIONS.

BERYLLIUM SCRAP, CHIPS & POWDER ARE NORMALLY RECYCLED. IN CASES WHERE NOT JUSTIFIED, MANUFACTURER RECOMMENDS ANY OFF-SPECIFICATION METALLIC BERYLLIUM DUST/POWDER BE SEALED WITHIN TWO PLASTIC BAGS & PLACED WITHIN DOT CONTAINER (INGRESS 16)

Disclaimer (provided with this information by the compiling agencies):

This information is formulated for use by elements of the Department of Defense. The United States of America in no manner whatsoever, expressly or implied, warrants this information to be accurate and disclaims all liability for its use. Any person utilizing this document should seek competent professional advice to verify and assume responsibility for the suitability of this information to their particular situation.

10.1.14 Beryllium Material Safety Data Sheet

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Beryllia Ceramic

SYNONYMS

MANUFACTURER

Beryllium Oxide

Beryllia

Thermalox Brush Ceramic Products, Inc.

6100 S. Tucson Boulevard

Tucson, Arizona 85706

Phone: (520) 746-0699

Fax: (520) 573-9077 *CHEMICAL FAMILY* Beryllium Compound

Transportation Emergency

Call Chemtrec at: *CUSTOMER SERVICE*

Domestic: (800) 424-9300 Brush Wellman Inc.

International: (703) 527-3887 Product Stewardship Department

Other Emergency 17876 St. Clair Avenue

Call Brush Wellman at: (800) 862-4118 Cleveland, Ohio 44110

Phone: (800) 862-4118

Revised: 01-12-06 Fax: (216) 383-4091

Replaces: MSDS C10 (01-13-03) Websites www.brushwellman.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL COMPOSITION (Percent by Weight)

BRUSH WELLMAN PRODUCT

CONSTITUENTS CAS Numbers Beryllia Ceramic

Beryllium Oxide 1304-56-9 100

Hazard Communication regulations of the U.S. Occupational Safety and Health Administration apply to this product.

NOTE: As used in this Material Safety Data Sheet, the term "particulate" refers to dust, mist, fume, fragments, particles and/or powder.

3. HAZARD IDENTIFICATION

3.1 EMERGENCY OVERVIEW

White solid, which poses little or no immediate hazard in solid form. See label in Section 16. If the material is involved in a fire; pressure-demand self-contained breathing apparatus and protective clothing must be worn by persons potentially exposed to the airborne particulate during or after a fire.

3.2 POTENTIAL HEALTH EFFECTS

Exposure to the elements listed in Section 2 by inhalation, ingestion, and skin contact can occur when sintering, machining, grinding, sanding, abrasive cutting, polishing, laser scribing and trimming, chemical etching, crushing, or otherwise abrading the surface of this material in a manner which generates particulate. Volatile beryllium hydroxide can be formed when firing solid BeO parts at temperatures greater than 900°C in a moist atmosphere such as in a hydrogen atmosphere sintering furnace. Exposure may also occur during repair or maintenance activities on contaminated equipment such as: furnace rebuilding, maintenance or repair of air cleaning equipment, structural renovation, etc. Particulate depositing on hands, gloves, and clothing, can be transferred to the breathing zone and inhaled during normal hand to face motions such as rubbing of the nose or eyes, sneezing, coughing, etc.

3.2.1. Inhalation

Beryllium Oxide: The beryllium in this product is not known to cause acute health effects. Inhaling particulate containing beryllium may cause a serious, chronic lung disease called Chronic Beryllium Disease (CBD) in some individuals. See section 3.2.5 Chronic (long-term health effects).

3.2.2. Ingestion

Ingestion can occur from hand, clothing, food and drink contact with particulate during hand to mouth activities such as eating, drinking, smoking, nail biting, etc. Beryllium Oxide: The health effect of ingestion of beryllium in the form found in this product is unknown.

3.2.3. Skin

Skin contact with this material may cause, in some sensitive individuals, an allergic dermal response. Skin contact may cause irritation. Symptoms include redness, itching and pain. Beryllium Oxide: Particulate that becomes lodged under the skin has the potential to induce sensitization and skin lesions.

3.2.4. Eyes

Exposure may result from direct contact with airborne particulate or contact to the eye with contaminated hands or clothing. Damage can result from irritation or mechanical injury to the eyes by particulate.

3.2.5. Chronic (long-term health effects)

Beryllium Oxide: Inhaling particulate containing beryllium may cause a serious, chronic lung disease called chronic beryllium disease (CBD) in some individuals. Over time lung disease can be fatal. Chronic beryllium disease is a hypersensitivity or allergic condition in which the tissues of the lungs become inflamed. This inflammation,

sometimes with accompanying fibrosis (scarring), may restrict the exchange of oxygen between the lungs and the bloodstream. Medical science suggests that CBD may be related to genetic factors.

3.2.6. Carcinogenic References

Beryllium Oxide: The International Agency for Research on Cancer (IARC) lists beryllium as a Group 1 – Known Human Carcinogen. The National Toxicology Program (NTP) lists beryllium as known to be human carcinogens. The ACGIH lists beryllium as an A1 – Confirmed Human Carcinogen. IARC lists beryllium as a known human carcinogen (Group1) and notes that the work environment of workers involved in refining, machining and producing beryllium metal was associated with an increased risk of lung cancer, “the greater excess was in workers hired before 1950 when exposures to beryllium in the work place were relatively uncontrolled and much higher than in subsequent decades”; and “the highest risk for lung cancer being observed among individuals diagnosed with acute beryllium-induced pneumonitis, who represent a group that had the most intense exposure to beryllium.” IARC further noted that “Prior to 1950, exposure to beryllium in working environments was usually very high, and concentrations exceeding 1 mg/m³ [1000 micrograms per cubic meter] were not unusual.”

3.2.7. Medical Conditions Aggravated by Exposure

Persons with impaired pulmonary function, airway diseases, or conditions such as asthma, emphysema, chronic bronchitis, etc. may incur further impairment if particulate is inhaled. If prior damage or disease to the neurologic (nervous), circulatory, hematologic (blood), or urinary (kidney) systems has occurred, proper screening or examinations should be conducted on individuals who may be exposed to further risk where handling and use of this material may cause exposure. Beryllium Oxide: The effects of chronic beryllium disease on the lungs and heart are additive to the effects of other health conditions.

3.3 POTENTIAL ENVIRONMENTAL EFFECTS

See Ecological Information (Section 12)

4. FIRST AID MEASURES

FIRST AID PROCEDURES

INHALATION: Breathing difficulty caused by inhalation of particulate requires immediate removal to fresh air. If breathing has stopped, perform artificial respiration and obtain medical help.

INGESTION: Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person.

SKIN: Thoroughly wash skin cuts or wounds to remove all particulate debris from the wound. Seek medical attention for wounds that cannot be thoroughly cleansed. Treat skin cuts and wounds with standard first aid practices such as cleansing, disinfecting and covering to prevent wound infection and contamination before continuing work. Obtain medical help for persistent irritation. Material accidentally implanted or lodged under the skin must be removed.

EYES: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

NOTE TO PHYSICIANS

Treatment of Chronic Beryllium Disease: There is no known treatment which will cure chronic beryllium disease. Prednisone or other corticosteroids are the most specific treatment currently available. They are directed at suppressing the immunological reaction and can be effective in diminishing signs and symptoms of chronic beryllium disease. In cases where steroid therapy has had only partial or minimal effectiveness, other immunosuppressive agents, such as cyclophosphamide, cyclosporine, or methotrexate, have been used. These latter agents remain investigational. Further, in view of the potential side effects of all the immunosuppressive medications, including steroids such as prednisone, they should be used only under the direct care of a physician. In general, these medications should be reserved for cases with significant symptoms and/or significant loss of lung function. Other symptomatic treatment, such as oxygen, inhaled steroids or bronchodilators, may be prescribed by some physicians and can be effective in selected cases. The decision about when and with what medication to treat is a judgment situation for individual physicians. For the most part, treatment is reserved for those persons with symptoms and measurable loss of lung function. The value of starting oral steroid treatment, before signs or symptoms are evident, remains a medically unresolved issue. The effects of continued low exposure to beryllium are unknown for individuals who are sensitized to beryllium or who have a diagnosis of chronic beryllium disease. It is generally recommended that persons who are sensitized to beryllium or who have CBD terminate their occupational exposure to beryllium.

5. FIRE FIGHTING MEASURES

Flash Point Not Applicable

Explosive Limits Not Applicable

Extinguishing Media Not Applicable

Unusual Fire and Explosion

Hazards

Not Applicable

Special Fire Fighting Procedures If this material becomes airborne as a respirable particulate during a fire situation, pressure-demand self-contained breathing apparatus must be worn by firefighters or any other persons potentially exposed.

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED

If this material is a particulate, establish a restricted entry zone based on the severity of the spill. Persons entering the restricted zone must wear adequate respiratory protection and protective clothing appropriate for the severity of the spill (see Section 8). Cleanup spills with a vacuum system utilizing a high efficiency particulate air (HEPA) filtration system followed by wet cleaning methods. Special precautions must be taken when changing filters on HEPA vacuum cleaners used to clean up hazardous materials. Be careful to minimize airborne generation of particulate and avoid contamination of air and water. Depending upon the quantity of material released into the environment, the incident may be required to be reported to the National Response Center at (800) 424-8802 as well as the State Emergency Response Commission and Local Emergency Planning Committee.

7. HANDLING AND STORAGE

HANDLING

Particulate may enter the body through cuts, abrasions or other wounds on the surface of the skin. Wear gloves when handling parts with loose surface particulate or sharp edges.

STORAGE

Store in a dry area.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

8.1 VENTILATION AND ENGINEERING CONTROLS

Whenever possible, the use of local exhaust ventilation or other engineering controls is the preferred method of controlling exposure to airborne particulate. Where utilized, exhaust inlets to the ventilation system must be positioned as close as possible to the source of airborne generation. Avoid disruption of the airflow in the area of a local exhaust inlet by equipment such as a man-cooling fan. Check ventilation equipment regularly to ensure it is functioning properly. Provide training on the use and operation of ventilation to all users. Use qualified professionals to design and install ventilation systems.

8.2 WORK PRACTICES

Develop work practices and procedures that prevent particulate from coming in contact with worker skin, hair, or personal clothing. If work practices and/or procedures are ineffective in controlling airborne exposure or visual particulate from deposition on skin, hair, or clothing, provide appropriate cleaning/washing facilities. Procedures should be written that clearly communicate the facility's requirements for protective clothing and personal hygiene. These clothing and personal hygiene requirements help keep particulate from being spread to non-production areas or from being taken home by the worker. Never use compressed air to clean work clothing or other surfaces.

Fabrication processes may leave a residue of particulate on the surface of parts, products or equipment that could result in employee exposure during subsequent material handling activities. As necessary, clean loose particulate from parts between processing steps. As a standard hygiene practice, wash hands before eating or smoking.

To prevent exposure, remove surface scale or oxidation formed on cast or heat treated products in an adequately ventilated process prior to working the surface.

8.3 WET METHODS

Machining operations conducted under a flood of liquid coolant require complete hooded containment and local exhaust ventilation. Openings into the hood must be baffled to prevent release of fast moving particulate. The cycling through a machine of liquid lubricant/coolant containing finely divided beryllium particulate in suspension can result in the concentration building to a point where the particulate may become airborne during use. Prevent

coolant from splashing onto floor areas, external structures or operators' clothing. Utilize a coolant filtering system to remove particulate from the coolant.

8.4 RESPIRATORY PROTECTION

When airborne exposures exceed or have the potential to exceed the occupational limits shown in Section 8.13, approved respirators must be used as specified by an Industrial Hygienist or other qualified professional. Respirator users must be medically evaluated to determine if they are physically capable of wearing a respirator. Quantitative and/or qualitative fit testing and respirator training must be satisfactorily completed by all personnel prior to respirator use. Users of tight fitting respirators must be clean shaven on those areas of the face where the respirator seal contacts the face. Exposure to unknown concentrations of particulate requires the wearing of a pressure-demand airline respirator or pressure-demand self-contained breathing apparatus (SCBA). Use pressure-demand airline respirators when performing jobs with high potential exposures such as changing filters in a baghouse air cleaning device.

8.5 OTHER PROTECTIVE EQUIPMENT

Protective overgarments or work clothing must be worn by persons who may become contaminated with particulate during activities such as machining, furnace rebuilding, air cleaning equipment filter changes, maintenance, furnace tending, etc. Contaminated work clothing and overgarments must be managed in a controlled manner to prevent secondary exposure to workers of third parties, to prevent the spread of particulate to other areas, and to prevent particulate from being taken home by workers.

8.6 PROTECTIVE GLOVES

Wear gloves to prevent contact with particulate or solutions. Wear gloves to prevent metal cuts and skin abrasions during handling.

8.7 EYE PROTECTION

Wear safety glasses, goggles, face shield, or welder's helmet when risk of eye injury is present, particularly during melting, casting, machining, grinding, welding, powder handling, etc.

8.8 HOUSEKEEPING

Use vacuum and wet cleaning methods for particulate removal from surfaces. Be certain to de-energize electrical systems, as necessary, before beginning wet cleaning. Use vacuum cleaners with high efficiency particulate air (HEPA). Do not use compressed air, brooms, or conventional vacuum cleaners to remove particulate from surfaces as this activity can result in elevated exposures to airborne particulate. Follow the manufacturer's instructions when performing maintenance on HEPA filtered vacuums used to clean hazardous materials.

8.9 MAINTENANCE

During repair or maintenance activities the potential exists for exposures to particulate in excess of the occupational standards. Under these circumstances, protecting workers can require the use of specific work practices or procedures involving the combined use of ventilation, wet and vacuum cleaning methods, respiratory protection, decontamination, special protective clothing, and when necessary, restricted work zones.

8.10 EXPOSURE CHARACTERIZATION

Determine exposure to airborne particulate by air sampling in the employee breathing zone, work area, and department. Utilize an Industrial Hygienist or other qualified professional to specify the frequency and type of air sampling. Develop and utilize a sampling strategy which identifies the extent of exposure variation and provides statistical confidence in the results. Conduct an exposure risk assessment of processes to determine if conditions or situations exist which dictate the need for additional controls or improved work practices. Make air sample results available to employees.

8.11 MEDICAL SURVEILLANCE

Beryllium Oxide: Medical surveillance for beryllium health effects includes (1) skin examination, (2) respiratory history, (3) examination of the lungs, (4) lung function tests (FVC and FEV1), and (5) periodic chest x-ray. In addition, a specialized, specific, immunological blood test, the beryllium blood lymphocyte proliferation test (BLPT), is available to assist in the diagnosis of beryllium related reactions. Individuals who have an abnormal BLPT are normally referred to a lung specialist for additional specific tests to determine if chronic beryllium disease is present. Note: Substantial inter- and intra-laboratory disagreement exists among the laboratories that conduct this test. The BLPT does not at this time meet the criteria for a screening test. Despite its limitations however, the BLPT remains a useful disease surveillance tool.

8.12 RISK FACTORS

Specific genetic factors have been identified and have been shown to increase an individual's susceptibility to CBD. Medical testing is available to detect genetic factors in individuals.

8.13 OCCUPATIONAL EXPOSURE LIMITS

CONSTITUENTS	OSHA*			ACGIH*		NIOSH RTECS NUMBER
	PEL	CEILING	PEAK	TLV	TLV-STEL	
Beryllium Oxide (as Be)	0.002	0.005	0.025	0.002	0.01	DS4025000

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Boiling Point (°F):	Not Applicable	Radioactivity:	Not Applicable
Evaporation Rate:	Not Applicable	Solubility:	None
Freezing Point (°F):	Not Applicable	Sublimes At (°F):	Not Applicable
Odor:	None	Vapor Density (Air = 1):	Not Applicable
pH:	Not Applicable	Vapor Pressure (mmHg):	Not Applicable
Physical State:	Solid	% Volatiles By Volume:	None
Color:	White	Melting Point (°F):	4455 (BeO)
Density (lb/in ³):	0.103 (BeO)		

10. STABILITY AND REACTIVITY

General Reactivity	This material is stable
Incompatibility (materials to avoid)	Not Applicable
Hazardous Decomposition Products	None under normal conditions of use
Hazardous Polymerization	Will not occur

11. TOXICOLOGICAL INFORMATION

For questions concerning toxicological information, write to: Medical Director, Brush Wellman Inc., 14710. West Portage River South Road, Elmore, Ohio 43416-9502.

12. ECOLOGICAL INFORMATION

This material can be recycled; contact your Sales Representative.

13. DISPOSAL CONSIDERATIONS

BYPRODUCT RECYCLING

When recycled (used in a process to recover metals), this material is not classified as hazardous waste under federal law. Seal particulate or particulate containing materials inside two plastic bags, place in a DOT approved container, and label appropriately.

SOLID WASTE MANAGEMENT

When recycled (used in a process to recover metals), this material is not classified as hazardous waste under federal law. When spent products are declared solid wastes (no longer recyclable), they must be labeled, managed and disposed of, in accordance with federal, state and local requirements.

14. TRANSPORT INFORMATION

There are no U.S. Department of Transportation hazardous material regulations which apply to the packaging and labeling of this product as shipped by Brush Ceramic Products. Hazard Communication regulations of the U.S. Occupational Safety and Health Administration require this product be labeled.

15. REGULATORY INFORMATION

15.1 UNITED STATES FEDERAL REGULATIONS

15.1.1. Occupational Safety and Health Administration (OSHA)

Air contaminants, 29 CFR 1910.1000

Hazard Communication Standard, 29 CFR 1910.1200

15.1.2. Environmental Protection Agency (EPA)

AMBIENT AIR EMISSIONS: Beryllium-containing materials are subject to the National Emission Standard for Beryllium as promulgated by EPA (40 CFR 61, Subpart C). The National Emission Standard for beryllium is 0.01 micrograms per cubic meter (30 day average) in ambient air for those production facilities which have been qualified to be regulated through ambient air monitoring. Other facilities must meet a 10 gram per 24- hour total site emission limit. Most process air emission sources will require an air permit from a local and/or state air pollution control agency. The use of air cleaning equipment may be necessary to achieve the permissible emission. Tempered makeup air should be provided to prevent excessive negative pressure in a building. Direct recycling of cleaned process exhaust air is not recommended. Plant exhausts should be located so as not to re-enter the plant through makeup air or other inlets. Regular maintenance and inspection of air cleaning equipment and monitoring of operating parameters is recommended to ensure adequate efficiency is maintained.

WASTEWATER: Wastewater regulations can vary considerably. Contact your local and state governments to determine their requirements.

TOXIC SUBSTANCES CONTROL ACT: Component(s) of this material is/are listed on the TSCA Chemical Substance Inventory of Existing Chemical Substances

SARA TITLE III REPORTING REQUIREMENTS: On February 16, 1988 the U.S. Environmental Protection Agency (EPA) issued a final rule that implements the requirements of the Superfund Amendments and Reauthorization Act (SARA) Title III, Section 313 (53) Federal Register 4525. Title III is the portion of SARA concerning emergency planning and community right-to-know issues. Section 313 covers annual emission reporting on specific chemicals which are manufactured, processed or used at certain U.S. Industrial facilities.

Brush Ceramic products are reportable under the Section 313 category of Compounds and/or Mixtures. These mixtures contain beryllium a reportable constituent. The specific chemical makeup, concentration by weight and the Chemical Abstracts Services number for each of our products is provided in Sections 2. You may obtain additional information by calling the EPA SARA Title III Hotline at 1-800-535-0202 (or 703 412 9810).

15.2 STATE REGULATIONS

Beryllium Oxide

- Is listed on the following state right to know lists: California, (listed as * * no name **), New Jersey, Florida, Pennsylvania, Minnesota, (listed as * * no name **) and Massachusetts.
- The following statements are made in order to comply with the California State Drinking Water Act - Warning: This product contains Beryllium Oxide, listed as " ** undefined **", a chemical known to the state of California to cause cancer.
- California No Significant Risk Level: CAS# 1304-56-9: No significant risk level = 0.1 ug/day

10.1.15 Mercury Material Safety Data Sheet

1. GENERAL INFORMATION

Synonyms: Quicksilver; hydrargyrum; Liquid Silver

CAS No.: 7439-97-6

Molecular Weight: 200.59

Chemical Formula: Hg

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient CAS No Percent Hazardous

Mercury 7439-97-6 90 - 100% Yes

3. HAZARDS IDENTIFICATION

Emergency Overview

DANGER! CORROSIVE. CAUSES BURNS TO SKIN, EYES, AND RESPIRATORY TRACT. MAY BE FATAL IF SWALLOWED OR INHALED. HARMFUL IF ABSORBED THROUGH SKIN. AFFECTS THE KIDNEYS AND CENTRAL NERVOUS SYSTEM. MAY CAUSE ALLERGIC SKIN REACTION.

Health Rating: 4 - Extreme (Poison)

Flammability Rating: 0 - None

Reactivity Rating: 1 - Slight

Contact Rating: 3 - Severe (Life)

Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES

Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:

Mercury vapor is highly toxic via this route. Causes severe respiratory tract damage. Symptoms include sore throat, coughing, pain, tightness in chest, breathing difficulties, shortness of breath, headache, muscle weakness, anorexia, gastrointestinal disturbance, ringing in the ear, liver changes, fever, bronchitis and pneumonitis. Can be absorbed through inhalation with symptoms similar to ingestion.

Ingestion:

May cause burning of the mouth and pharynx, abdominal pain, vomiting, corrosive ulceration, bloody diarrhea. May be followed by a rapid and weak pulse, shallow breathing, paleness, exhaustion, tremors and collapse. Delayed death may occur from renal failure. Gastrointestinal uptake of mercury is less than 5% but its ability to penetrate tissues presents some hazard. Initial symptoms may be thirst, possible abdominal discomfort.

Skin Contact:

Causes irritation and burns to skin. Symptoms include redness and pain. May cause skin allergy and sensitization. Can be absorbed through the skin with symptoms to parallel ingestion.

Eye Contact:

Causes irritation and burns to eyes. Symptoms include redness, pain, blurred vision; may cause serious and permanent eye damage.

Chronic Exposure:

Chronic exposure through any route can produce central nervous system damage. May cause muscle tremors, personality and behavior changes, memory loss, metallic taste, loosening of the teeth, digestive disorders, skin rashes, brain damage and kidney damage. Can cause skin allergies and accumulate in the body. Repeated skin contact can cause the skin to turn gray in color. A suspected reproductive hazard; may damage the developing fetus and decrease fertility in males and females.

Aggravation of Pre-existing Conditions:

Persons with nervous disorders, or impaired kidney or respiratory function, or a history of allergies or a known sensitization to mercury may be more susceptible to the effects of the substance.

4. FIRST AID MEASURES

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. FIRE FIGHTING MEASURES

Fire:

Not considered to be a fire hazard.

Explosion:

Not considered to be an explosion hazard.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire. Do not allow water runoff to enter sewers or waterways.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode. Undergoes hazardous reactions in the presence of heat and sparks or ignition. Smoke may contain toxic mercury or mercuric oxide. Smoke may contain toxic mercury or mercuric oxide.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Clean-up personnel require protective clothing and respiratory protection from vapor.

Spills: Pick up and place in a suitable container for reclamation or disposal in a method that does not generate misting. Sprinkle area with sulfur or calcium polysulfide to suppress mercury. Do not flush to sewer. US Regulations

(CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. HANDLING AND STORAGE

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Do not use or store on porous work surfaces (wood, unsealed concrete, etc.). Follow strict hygiene practices. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. EXPOSURE CONTROLS/PERSONAL PROTECTIVE EQUIPMENT

Airborne Exposure Limits:

- OSHA Acceptable Ceiling Concentration:
mercury and mercury compounds: 0.1 mg/m³ (TWA), skin
- ACGIH Threshold Limit Value (TLV):
inorganic and metallic mercury, as Hg: 0.025 mg/m³ (TWA) skin, A4 Not classifiable as a human carcinogen.
- ACGIH Biological Exposure Indices:
total inorganic mercury in urine (preshift): 35 ug/g creatinine;
total inorganic mercury in blood (end of shift): 15 ug/l.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, a half-face respirator with a mercury vapor or chlorine gas cartridge may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece respirator with a mercury vapor or chlorine gas cartridge may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Silver-white, heavy, mobile, liquid metal.
Odor: Odorless.
Solubility: Insoluble in water.
Density: 13.55
pH: No information found.
% Volatiles by volume @ 21C (70F): 100
Boiling Point: 356.7C (675F)
Melting Point: -38.87C (-38F)
Vapor Density (Air=1): 7.0
Vapor Pressure (mm Hg): 0.0018 @ 25C (77F)
Evaporation Rate (BuAc=1): 4

10. STABILITY AND REACTIVITY

Stability: Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products: At high temperatures, vaporizes to form extremely toxic fumes.
Hazardous Polymerization: Will not occur.
Incompatibilities: Acetylenes, ammonia, ethylene oxide, chlorine dioxide, azides, metal oxides, methyl silane, lithium, rubidium, oxygen, strong oxidants, metal carbonyls.
Conditions to Avoid: Heat, flames, ignition sources, metal surfaces and incompatibles.

11. TOXICOLOGICAL INFORMATION

Toxicological Data: Investigated as a tumorigen, mutagen, reproductive effector.
Reproductive Toxicity: All forms of mercury can cross the placenta to the fetus, but most of what is known has been learned from experimental animals. See Chronic Health Hazards.
Carcinogenicity: EPA / IRIS classification: Group D1 - Not classifiable as a human carcinogen.
-----\Cancer Lists\-----
---NTP Carcinogen---
Ingredient Known Anticipated IARC Category

Mercury (7439-97-6) No No 3

12. ECOLOGICAL INFORMATION

Environmental Fate: This material has an experimentally-determined bioconcentration factor (BCF) of greater than 100. This material is expected to significantly bioaccumulate.
Environmental Toxicity: This material is expected to be toxic to aquatic life. The LC50/96-hour values for fish are less than 1 mg/l.

13. DISPOSAL CONSIDERATIONS

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. TRANSPORTATION INFORMATION

Domestic (Land, D.O.T.)

Proper Shipping Name: RQ, MERCURY
Hazard Class: 8
UN/NA: UN2809
Packing Group: III
Information reported for product/size: 1LB

International (Water, I.M.O.)

Proper Shipping Name: MERCURY
Hazard Class: 8
UN/NA: UN2809
Packing Group: III
Information reported for product/size: 1LB

15. OTHER INFORMATION

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **0**

Label Hazard Warning:

DANGER! CORROSIVE. CAUSES BURNS TO SKIN, EYES, AND RESPIRATORY TRACT. MAY BE FATAL IF SWALLOWED OR INHALED. HARMFUL IF ABSORBED THROUGH SKIN. AFFECTS THE KIDNEYS AND CENTRAL NERVOUS SYSTEM. MAY CAUSE ALLERGIC SKIN REACTION.

Label Precautions:

Do not get in eyes, on skin, or on clothing.

Do not breathe vapor.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

Label First Aid:

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases get medical attention immediately.

Product Use:

Laboratory Reagent.

Revision Information:

No Changes.

Disclaimer: Follows next page

Impact Environmental Consulting, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. IMPACT ENVIRONMENTAL CONSULTING, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, IMPACT ENVIRONMENTAL CONSULTING, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

Emergency Contact Information

In the event of an accident or emergency situation, emergency procedures will be executed. Said procedures can and will be executed by the first person to observe an accident or emergency situation. The Project Field Manager will be notified about the situation immediately after emergency procedures are implemented.

10.1.16 Emergency Contacts

Emergency:	911	
Hospital:	212-781-8640	Columbia Presbyterian Hospital
Police:	911	Police
Fire Department:	911	NYFD
Chemtrec:	800-424-9300	
Poison Control Center:	800-336-6997	
National Response Center:	800-424-8802	
US EPA (24-hour hotline):	800-424-9346	

 **521 W 145th St, New York, NY 10031-0695**

 1. Start out going **northwest** on **W 145th St** toward **Broadway**. [Map](#)

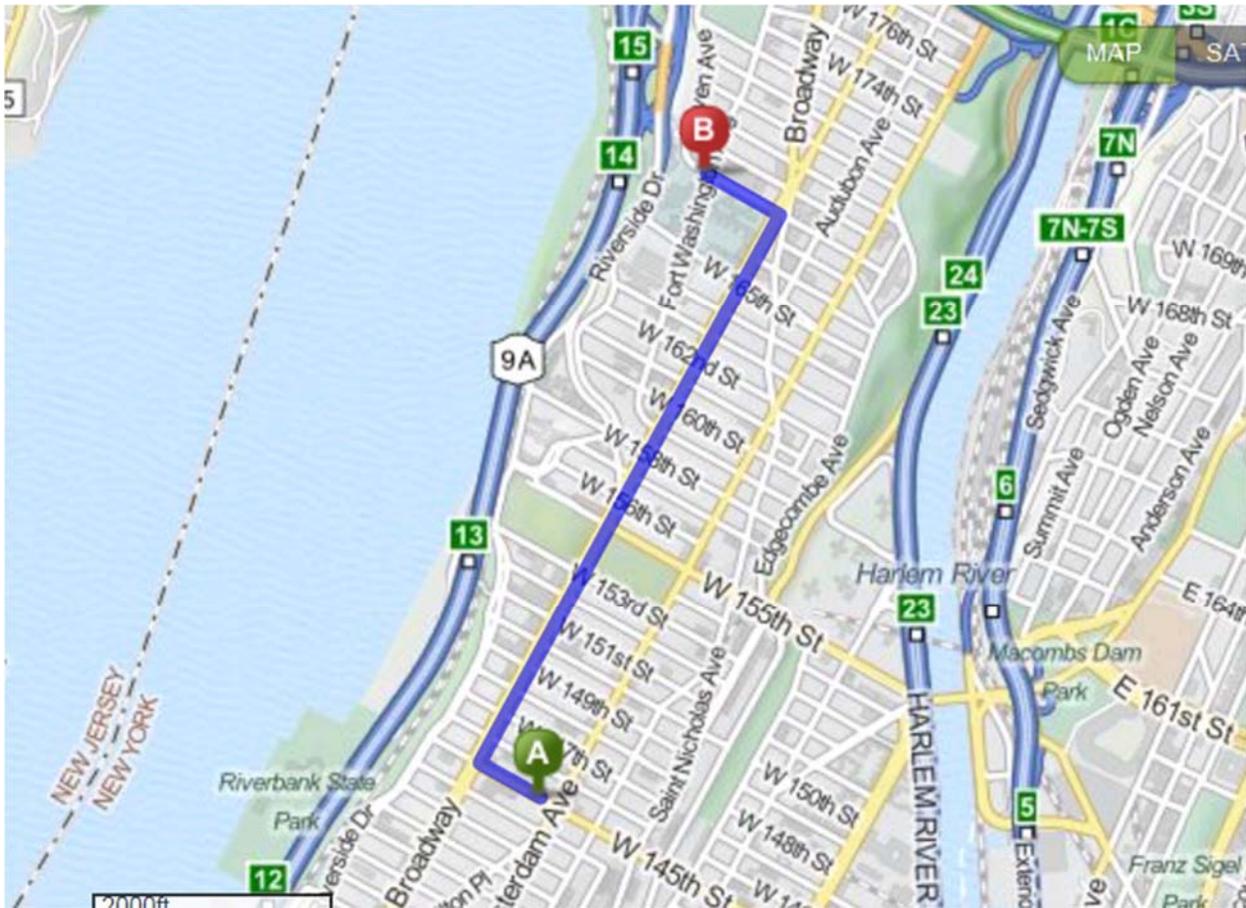
 2. Take the **1st right** onto **Broadway**. [Map](#)
*Once Trading Corp is on the right
 If you reach Riverside Dr you've gone a little too far*

 3. Turn **left** onto **W 168th St**. [Map](#)
*W 168th St is just past W 166th St
 Famiglia Pizzeria is on the corner
 If you reach W 169th St you've gone a little too far*

 4. **722 W 168TH ST** is on the **left**. [Map](#)
If you reach Fort Washington Ave you've gone a little too far

 **722 W 168th St, New York, NY 10032-3702**

Total Travel Estimate: **1.44 miles - about 5 minutes**



10.1.17 Utility Emergencies / Initiating Subsurface Investigation Work

Where necessary, utility markouts will be called in via the one call center or to the individual entities listed below.

Mark Out One-Call Center	1-800-272-4480	No-Cuts
Gas Company:	718-643-4050	Keyspan/Con Edison
Telephone Company:	516-661-6000	Bell Atlantic / Verizon
Electric Company:	718-643-4050	Keyspan/Con Edison

10.2 Contingency / Evacuation Plan

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to emergency procedures. Rather, contractors, subcontractors and workers at

the site must refer to OSHA's Employee Emergency Action Plan Standard, set forth at 29 C.F.R. § 1910 Part 1926.35(a), as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations.

If an unknown substance or substance container is encountered during site activities, the following contingency plan will be triggered.

1. The Site Health and Safety Officer, Project Manager and Field Operations Leader will be notified and an Exclusion Zone (the aerial extent of which will be determined by the above safety staff) will be established.
2. All staff will be evacuated from the Exclusion Zone.
3. Air monitoring will be conducted down-wind of the Exclusion Zone.
4. The NYSDEC, as well as any other Government regulatory agency whose need may be prompted by the particular situation, will be notified.
5. Upon arrival of the NYSDEC or Government regulatory agency representative(s), site control will transfer to the appropriate Government personnel.

It may be possible that a situation could develop site emergency could necessitate the evacuation of all personnel from the site. If such a situation develops, an audible alarm shall be given for site evacuation (consisting of an air horn). Personnel shall evacuate the site in a calm and controlled fashion and regroup at a predetermined location. The route of evacuation will be dependent on wind direction, severity, type of incident, etc. The site must not be re-entered until back-up help, monitoring equipment, and/or personal protective equipment are on hand and the appropriate regulatory agencies have been notified.

10.3 Emergency Medical Treatment Procedures

This Section is not, nor does it purport to be, a comprehensive recitation of safety and health requirements applicable to medical treatment and first aid. Rather, contractors, subcontractors and workers at the site must refer to OSHA's Medical Services and First Aid Standard, set forth at 29 C.F.R. § 1910 Part 1926.23 and 1926.50, as well as all supporting OSHA Compliance Directives and Letters of Interpretation, for complete information on safety and health compliance obligations.

All injuries, no matter how slight, will be reported to the site safety supervisor immediately. The safety supervisor will complete an accident report for all incidents (Appendix B).

Some injuries, such as severe lacerations or burns, may require immediate treatment. Unless required due to immediate danger, seriously injured persons should not be moved without direction from attending medical personnel.

10.3.1 Standard Procedures for Injury

1. Notify the Site Health and Safety Officer, Project Manager, and the NYCDEP and NYCDHPD of all accidents, incidents, and near emergency situations.
2. If the injury is minor, trained personnel should proceed to administer appropriate first aid.
3. Telephone for ambulance/medical assistance if necessary. Whenever possible, notify the receiving hospital of the nature of physical injury or chemical overexposure. If no phone is available, transport the person to the nearest hospital. Refer to the map in section 11.2.1.
4. When transporting an injured person to a hospital, bring this Health and Safety Plan with the attached MSDS to assist medical personnel with diagnosis and treatment.

10.3.2 Chemical Overexposure

In all cases of chemical overexposure, follow standard procedures as outlined below for poison management, first aid, and, if applicable, cardiopulmonary resuscitation. Different routes of exposure and their respective first aid/poison management procedures are outlined below.

Ingestion	Do not induce vomiting unless prompted by a health professional. Transport person to nearest hospital immediately.
Inhalation / Confined Space	Do not enter a confined space to rescue someone who has been overcome unless properly equipped and a standby person present.
Inhalation / Other	Move the person from the contaminated environment. Initiate CPR if necessary. Call or have someone call for medical assistance. Refer to MSDS for additional specific information. If necessary, transport the victim to the nearest hospital as soon as possible.
Skin Contact / Non-	Wash off skin with a large amount of water immediately. Remove any

Caustic Contaminant (Petroleum, Gasoline, etc.)	affected clothing and rewash skin using soap, if available. Transport person to a medical facility if necessary.
Skin Contact / Corrosive Contaminant (Acids, Hydrogen Peroxide, etc.)	Wash off skin with a large amount of water immediately. Remove any affected clothing and rewash skin with water. Transport person to a medical facility if necessary.
Eyes	Hold eyelids open and rinse the eyes immediately with large amounts of water for 15 minutes. Never permit the eyes to be rubbed. Transport person to a medical facility as soon as possible.

10.3.3 First Aid for Injuries Incurred During Field Work

A first aid kit and an emergency eyewash will be available on-site. Field crews, when performing field operations, will carry portable first aid kits that include emergency eye wash stations.

10.3.4 First Aid Equipment List

The first aid kit(s) kept at the site will consist of a weatherproof container with individually sealed packages for each type of item.

The kit will include at least the following items:

- Gauze roller bandages, 1-inch and 2-inch
- Gauze compress bandages, 4-inch
- Gauze pads, 2-inch
- Adhesive tape, 1-inch
- Bandage, 1-inch
- Butterfly bandages
- Triangular bandages, 40-inch
- Ampules of ammonia inhalants
- Antiseptic applicators or swabs
- Burn dressing and sterilized towels
- Surgical scissors

- Eye dressing
- Portable emergency eye wash
- Emergency oxygen supply
- Alcohol
- Hydrogen peroxide
- Clinical grade thermometer
- Tourniquet

10.3.5 Other Emergency Equipment

One portable fire extinguisher with a rating (ratio) of 20 pound A/B/C and one portable fire extinguisher with a rating of 2A will be conspicuously and centrally located between the restricted and non-restricted zones. In addition, similar extinguishers of the same size and class will be located in the site office trailer so that maximum travel distance to the nearest unit shall not exceed 50 feet. Portable extinguishers will be properly tagged with inspection dates and maintained in accordance with standard maintenance procedures for portable fire extinguishers. Field personnel will be trained in fire extinguisher use before field operations begin.

An emergency at any part of the site, such as fire or chemical release, might require that some appropriately trained site workers direct traffic on or near the site.

The following safety equipment to be used for traffic should be kept readily available on site in the field office:

- reflective/fluorescent vests
- flares
- traffic cones (and flags, or the equivalent, as needed)
- hazard tape (barricades as needed)
- working flashlights

10.4 Record of Injuries Incurred On-Site

10.4.1 Occupational Injuries and Illnesses Form (OSHA 200)

All occupational injuries and illnesses that are required to be recorded under the Occupational Safety and Health Act will be registered on OSHA Form 200 (see Appendix C). The site safety supervisor will record occupational injuries and illnesses within 48 hours of occurrence, as required by statute.

10.4.2 Employer's First Report of Injury

The site safety supervisor for all accidents involving work injury at the site will complete this form (Appendix D). Follow-up procedures will include investigation of each accident or near-miss by the safety supervisor to assure that no similar accidents occur in the future.

Appendix A
Accident Report Form

OSHA's Form 301

Injuries and Illnesses Incident Report

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.



U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related Injuries and Illnesses* and the accompanying *Summary*, these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by _____
Title _____
Phone _____ Date _____

Information about the employee

- 1) Full Name _____
- 2) Street _____
City _____ State _____ Zip _____
- 3) Date of birth _____
- 4) Date hired _____
- 5) Male
 Female

Information about the physician or other health care professional

- 6) Name of physician or other health care professional

- 7) If treatment was given away from the worksite, where was it given?
Facility _____
Street _____
City _____ State _____ Zip _____

- 8) Was employee treated in an emergency room?
 Yes
 No
- 9) Was employee hospitalized overnight as an in-patient?
 Yes
 No

Information about the case

- 10) Case number from the Log _____ (Transfer the case number from the Log after you record the case.)
- 11) Date of injury or illness _____
- 12) Time employee began work _____ AM/PM
- 13) Time of event _____ AM/PM Check if time cannot be determined
- 14) **What was the employee doing just before the incident occurred?** Describe the activity, as well as the tools, equipment or material the employee was using. Be specific. Examples: "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."
- 15) **What happened?** Tell us how the injury occurred. Examples: "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."
- 16) **What was the injury or illness?** Tell us the part of the body that was affected and how it was affected; be more specific than "hurt", "pain", or "sore." Examples: "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."
- 17) **What object or substance directly harmed the employee?** Examples: "concrete floor"; "chlorine"; "radial arm saw." If this question does not apply to the incident, leave it blank.
- 18) **If the employee died, when did death occur?** Date of death _____

Appendix B
OSHA Form 300 – Occupational Injuries & Illnesses

OSHA's Form 300A (Rev. 01/2004)

Summary of Work-Related Injuries and Illnesses

Year _____



U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the log. If you had no cases write "0."

Employees former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 1904.35, in OSHA's Recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	0	0	0
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
0	0
(K)	(L)

Injury and Illness Types

Total number of... (M)			
(1) Injury	0	(4) Poisoning	0
(2) Skin Disorder	0	(5) Hearing Loss	0
(3) Respiratory Condition	0	(6) All Other Illnesses	0

Post this Summary page from February 1 to April 30 of the year following the year covered by the form

Public reporting burden for this collection of information is estimated to average 58 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

Establishment information

Your establishment name _____

Street _____

City _____ State _____ Zip _____

Industry description (e.g., Manufacture of motor truck trailers)

Standard Industrial Classification (SIC), if known (e.g., SIC 3715)

OR North American Industrial Classification (NAICS), if known (e.g., 336212)

Employment information

Annual average number of employees _____

Total hours worked by all employees last year _____

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Company executive

Title

Phone

Date

Appendix C
Safety Meeting Sheet

HEALTH AND SAFETY BRIEFING STATEMENT

The following personnel were present at a pre-job safety briefing conducted at _____(time) on _____ (date) a _____(location), and have read this Health and Safety Plan for the above Site and are familiar with its provisions:

Name	Signature
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Fully charged ABC class fire extinguisher available on Site? _____
Fully stocked First Aid Kit available on Site? _____
All project personnel advised of location of nearest phone? _____
All project personnel advised of location of designated medical facility? _____

Name of Field Team Leader or Site Safety Officer

Signature Date

Appendix D
Vapor Monitoring Sheet

On- Site Dust and Volatile Organic Vapor Monitoring

Project: _____	Job No.: _____	
Location: _____	On-site Personnel: _____	
Day & Date: _____	Weather: _____	
AM	PM	Sample Interval: 15 minutes
Wind Direction		Background Reading (particulates) mg/m³
Temperature Range:	°F	Background Reading (organic vapors) ppm
Calibration Dates:	Particulate Meters: _____	Photoionization Detector: _____
Action	Organic vapors: > 5ppm above background levels/ 15 minute readings	
Level/Response:	Particulates: 0.100 mg/m ³ above up wind reading/15 minute period	

Time	Particulate levels:		ORGANIC VAPOR LEVELS (ppm)	NOTES
	UPWIND (mg/m ³)	DOWNWIND (mg/m ³)		
0700				
0715				
0730				
0745				
0800				
0815				
0830				
0845				
0900				
0915				
0930				
0945				
1000				
1015				
1030				
1045				
1100				
1115				
1130				
1145				
1200				

Project: _____

Job No.: _____

Location: _____

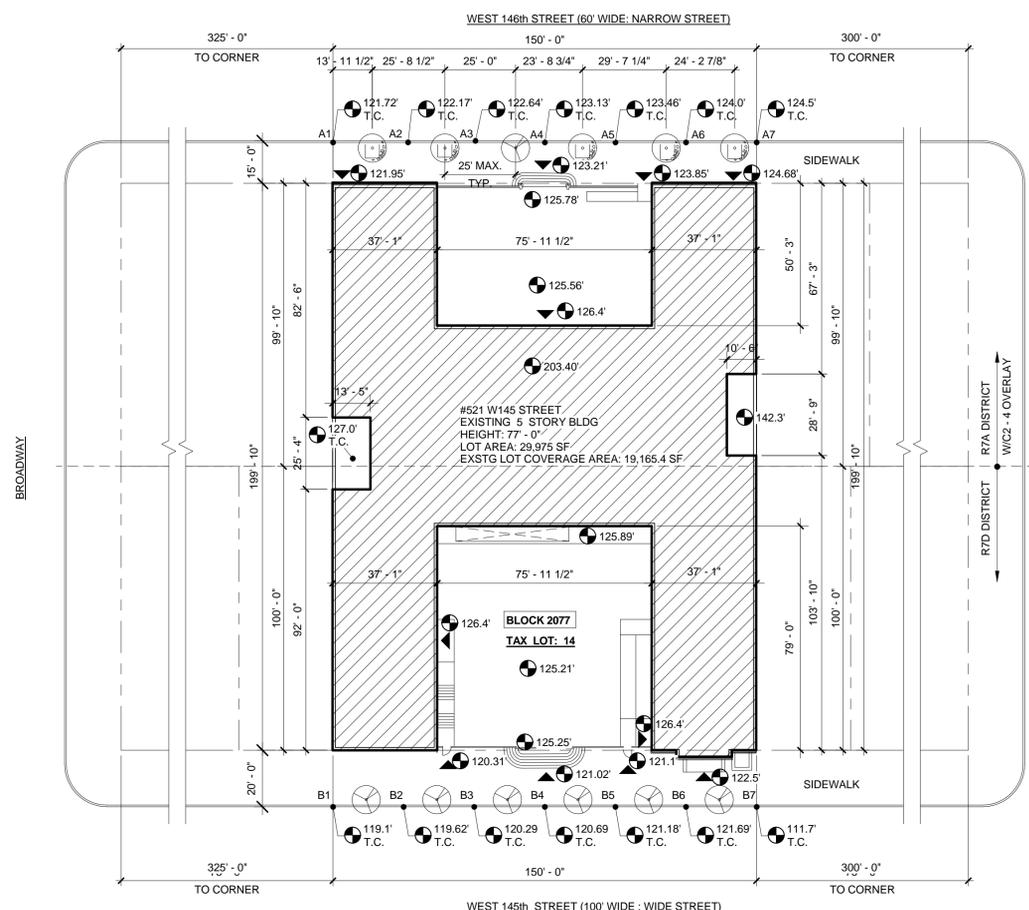
Day & Date: _____

Time	Particulate levels:		ORGANIC VAPOR LEVELS (ppm)	NOTES
	UPWIND (mg/m ³)	DOWNWIND (mg/m ³)		
1215				
1230				
1245				
1300				
1315				
1330				
1345				
1400				
1415				
1430				
1445				
1500				
1515				
1530				
1545				
1600				
1615				
1630				
1645				
1700				

APPENDIX E
PROPOSED REDEVELOPMENT PLANS

SITE PLAN DIAGRAM

BLOCK: 2077	ZONING LOT: 14	ZONING DISTRICT: PROPOSED R7D WITH C2-4 AND R7A	ZONING MAP NO: 6A
----------------	-------------------	--	----------------------



'CURB LEVEL' CALCULATION

WEST 146th STREET	WEST 145th STREET
A1 121.72'	B1 119.1'
A2 122.17'	B2 119.62'
A3 122.64'	B3 120.29'
A4 123.13'	B4 120.69'
A5 123.46'	B5 121.18'
A6 124.0'	B6 121.69'
A7 124.5'	B7 122.7'
AVERAGE CURB LEVEL 123.09'	AVERAGE CURB LEVEL 120.75'

'BASE PLANE' ELEVATION

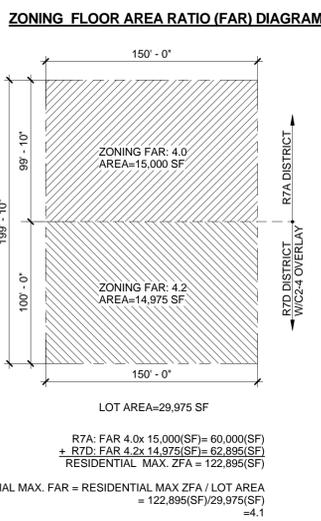
123.09' x 50% + 120.75' x 50%

= 61.55' + 60.38'

= 121.93'

BUILDING ZONING FLOOR AREA SUMMARY

FLOOR	RESIDENTIAL	COMMUNITY FACILITY	TOTAL
1ST	9,342.2 sf	9,907.7 sf	11,349.5 sf
2ND	19,165.4 sf	0 sf	19,165.4 sf
3RD	19,165.4 sf	0 sf	19,165.4 sf
4TH	19,165.4 sf	0 sf	19,165.4 sf
5TH	19,165.4 sf	0 sf	19,165.4 sf
TOTAL ZFA	86,003.8 sf	9,907.7 sf	95,911.5 sf
TOTAL LOT AREA			29,975 sf
PROPOSED FAR			3.2
PROPOSED LOT COVERAGE AREA			19,165.4 sf
PROPOSED LOT COVERAGE			64%



STREET TREE REQUIREMENTS

LOT FRONTAGE (IN LINEAR FEET)	TOTAL STREET FRONTAGE (FT)	CODE FACTOR (LFTREE)	REQUIRED TREES
W146 ST	W145 ST	300	25
150	150		12

PERMITTED USES

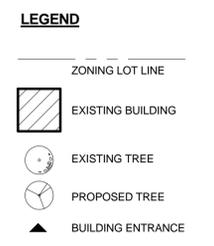
Z.R. REF.	ITEM	PERMITTED	PROPOSED	REMARKS
22-00	Permitted use groups in R7D/C2-4	1-9 and 14	2 and 4	Complies
	Permitted use groups in R7A	1 to 4	2	Complies

FLOOR AREA AND BULK REGULATIONS

Z.R. REF.	ITEM	ALLOWABLE	PROPOSED WITHIN EXSTG	REMARKS
23-011	Any building containing residences shall also comply Quality Housing Program - R7A, R7D			
23-145, 77-22, & 42-77	Maximum Lot Coverage	R7D 65%	19165.4(SF) 29,976(SF)	Complies
	Maximum Residential FAR	R7A 4.2	4.0	Complies
	Maximum Residential Floor Area (SF)	R7D 122,898	86,003.8	Complies
24-11	Maximum Community Facility FAR - R7D	4.2	0.7	Complies
24-161	(Residential Floor Area + Community Facility Area) / Lot Area	4.2	3.2	Complies
33-121	Commercial District FAR - C2-4	4.0	0.7	Complies
23-22	Maximum Number of Dwelling Units	60,000	9,907.7	Complies
23-32	Minimum Lot Area for Residences (SF)	180	81	Complies
	Min. Lot width for Residences	1,700	29,975	Complies
		18'-0"	150'-0"	Complies

STREET TREE PLANTING

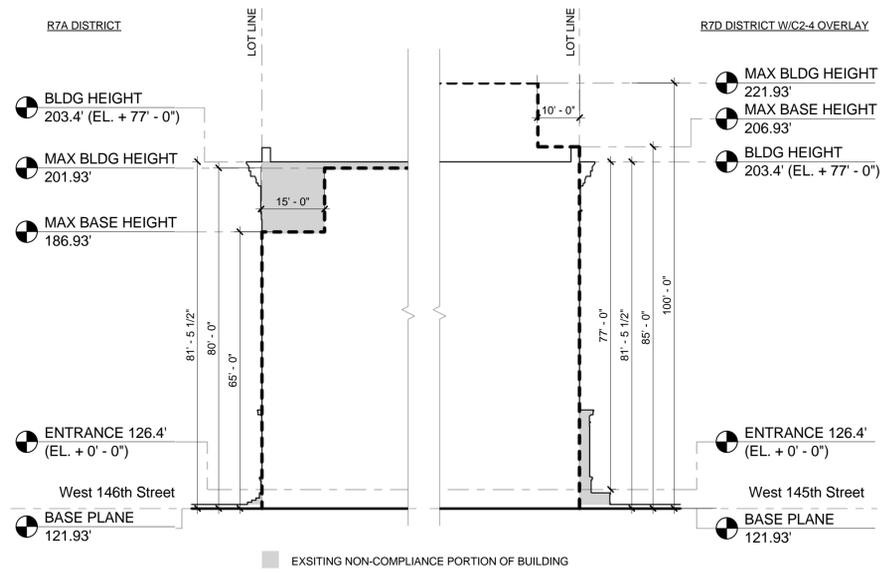
Z.R. REF.	ITEM	REQUIRED	PROPOSED	REMARKS
23-03	Conversions of 20% or more of the floor area of building to residential use. Street tree planting is required in accordance with ZR 26-14.			Complies
24-05	One Street tree or pre-existing tree shall be provided for every 25 feet of street frontage.	12	12	5 existing + 7 new trees



YARD REGULATIONS

Z.R. REF.	ITEM	REQUIRED	PROPOSED	REMARKS
23-45 & 24-34	Front Yards	None	None	Complies
23-462 (c)	Side Yards	None	None	Complies
24-35	Minimum requirement rear yard	8' min. if provided	None	Complies
63-42, 74-32	Required Rear Yard Equivalents for Through Lots	30'	None	* Existing Non-Compliance
23-532, & 24-382	A) Open area with minimum depth of 60'-0" linking adjoining rear yards or midway (within 5'-0") between the two street lines required for Quality Housing Buildings in R7A and R7D district on any through lot over 180' depth. B) Two open areas, each adjoining and extending along the full length of the street with a minimum depth of 30'-0". Except that the depth on one side may be decreased if: a corresponding increase in depth is made on the other street and any required front setback area are maintained C) An open area adjoining and extending along the full length along the full length of each side lot line with a minimum width of 30'-0"			Existing building does not meet any equivalent * Existing Non-Compliance

HEIGHT AND SETBACK REGULATION DIAGRAM

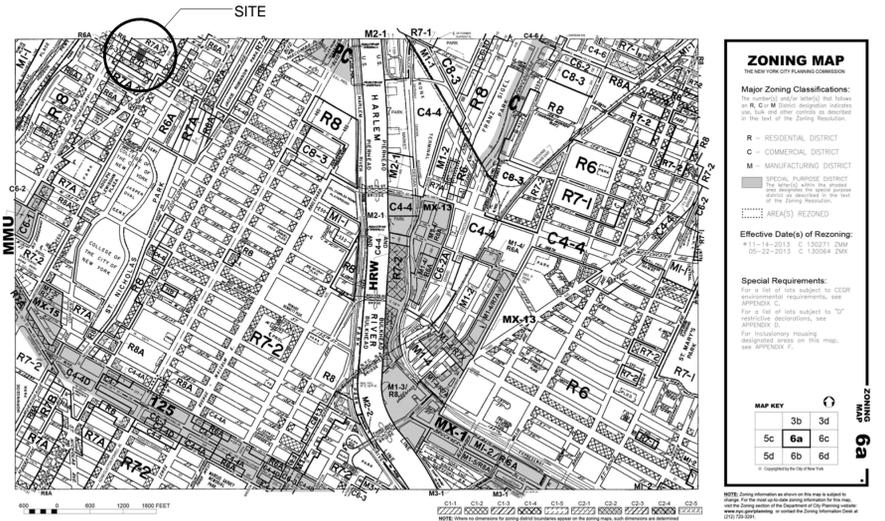


HEIGHT AND SETBACK REGULATIONS

Z.R. REF.	ITEM	REQUIRED	PROPOSED WITHIN EXSTG	REMARKS
23-633	Base & Building Height			
23-633 (d) (3)	R7D			
	Minimum base height	60'	82.46'	Complies
	Maximum base height	85'	82.46'	Complies
23-633 (b) (1)	Minimum setback depth	10'	Building height below base height	Complies
23-633 (d) (3)	R7A			
	Minimum base height	40'	82.46'	* Existing Non-Compliance
	Maximum base height	65'	82.46'	* Existing Non-Compliance
23-633 (b) (1)	Minimum setback depth	15'	None	* Existing Non-Compliance

* No change in degree of non-compliance. Refer to ZR 54-31 in this analysis.

ZONING MAP



PS 186

521 West 145th Street
New York, New York

Boys & Girls Club of Harlem
11 Hanover Square, Suite 701
New York, New York 10001

Alembic Community Development
155 3rd Street
Brooklyn, New York 11231

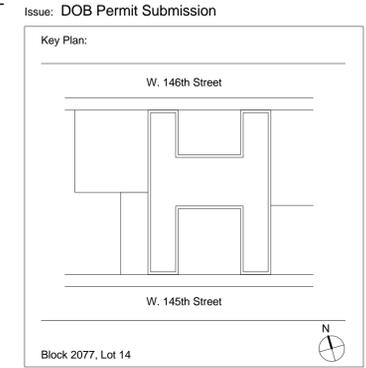
Monadnock Construction, Inc.
155 3rd Street
Brooklyn, New York 11231

DattnerArchitects
1385 Broadway, 15th Floor
New York, NY 10018
tel 212 247 2660
info@dattner.com

Structural Engineers
De Nardis Engineering, LLC
15 Reservoir Road
White Plains, NY 10603-2516

Mechanical Electrical Plumbing Engineers
Abraham Joselow, P.C.
45 West 34th Street Suite 1101
New York, NY 10001

Revisions:



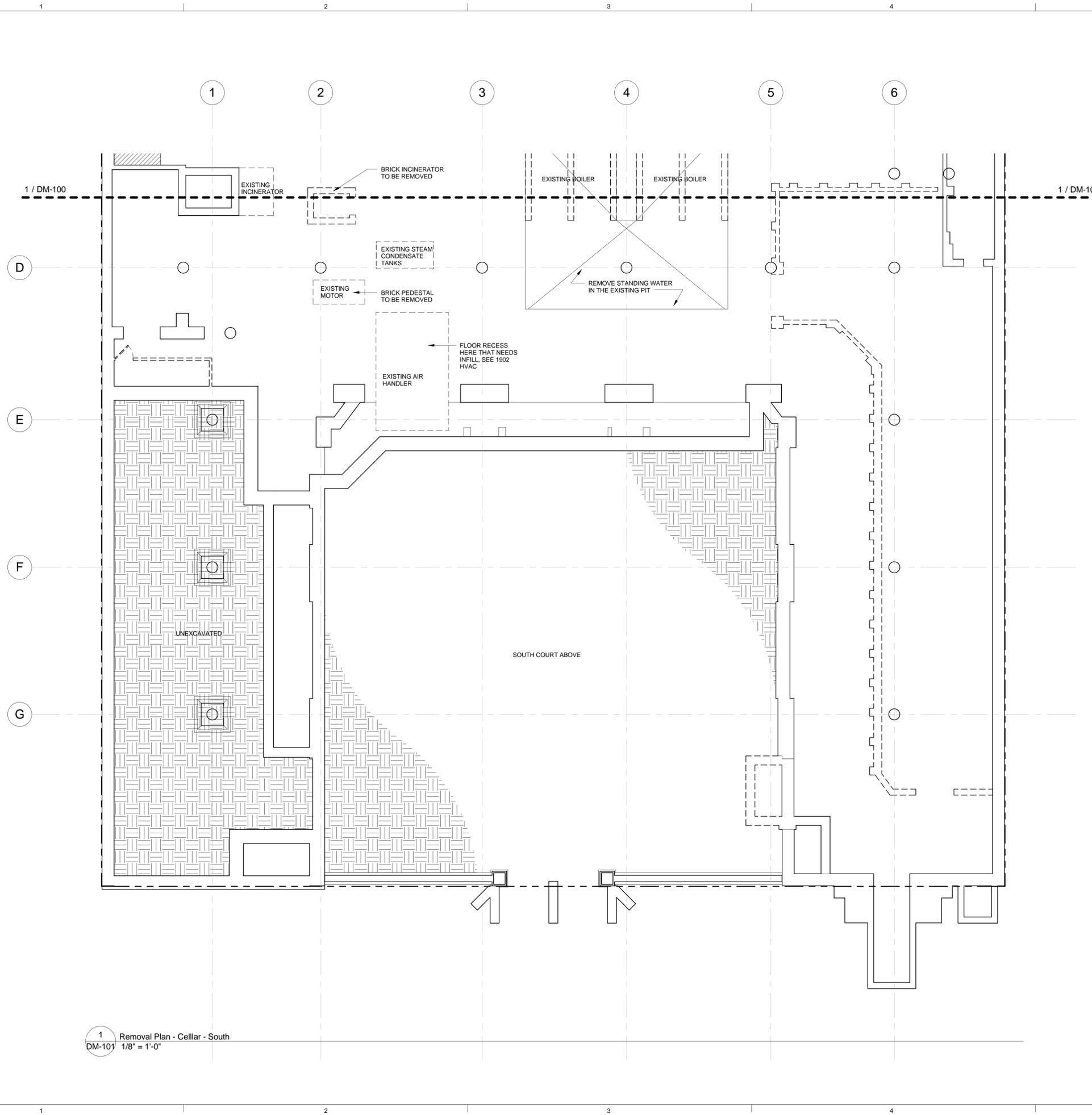
Key Plan
© 2014 Dattner Architects D.P.C.
Zoning Notes and Diagrams

Date: 02/14/14
Scale: As indicated
Drawn By: JC
Checked By: JC/KN
Project No: 1214 Seal
Sheet No: **Z-001.00**



By access or receipt, the User acknowledges, consents and agrees that the documents, provided by Richard Dattner & Partners Architects (DTP), including but not limited to plans and specifications, in any media (the "Documents"), are copyrighted instruments of professional services. The User agrees that the Documents may not be used for any other project or for any other purpose without the written consent of DTP. The User further agrees that DTP and its affiliates have no responsibility or liability in connection with the execution, use, reuse, change or modification of the Documents in any manner by the User or any other party accessing the Documents. No representation is made by DTP as to the accuracy or reliability of the Documents or any other party accessing the Documents. Use of the Documents is at the sole risk of the User or any other party accessing the Documents. Use of the Documents in any manner other than that intended by DTP, including but not limited to reproduction, distribution, modification, or use for any other purpose, is strictly prohibited. DTP and its affiliates make no warranty, either express or implied, as to the merchantability and fitness for any particular purpose.

Project: 01/13/2014 2:46:14 PM



Removals Plan Legend

- EXISTING WALL TO REMAIN
- EXISTING SLAB OPENING
- REMOVAL
- REMOVE EXISTING SLAB & STAIR FLIGHTS, SEE STRUCTURAL TO IDENTIFY REMOVAL OF EXISTING STEEL BEAMS.
- Removal Key

Removal Key Notes

#	REMOVAL NOTES
1	REMOVE EXISTING CMU INFILL AND ANY REMAINING EXISTING WOOD WINDOW FRAME, TYP.
2	SAWCUT EXISTING STONE WALL.
3	COMPLETELY REMOVE EXISTING WOOD WINDOW FRAMES AND MULLIONS, TYP.
4	REMOVE EXISTING LIGHT FIXTURES AND CONDUITS.
5	REMOVE PLASTER AND TERRA COTTA BLOCK DOWN TO STEEL COLUMN, TYP.
6	CAREFULLY REMOVE EXISTING INFILL IN FRONT OF GATE. CAREFULLY REMOVE GATE TO REFURBISH IN THE SHOP. GC TO COORDINATE FOR REMOVAL AND STORING.
7	REMOVE EXISTING STEEL WINDOW AND STEEL BEAM CLOSURE.
8	ENTIRE ROOF SLAB TOPPING ABOVE TERRA COTTA ARCH TO BE REMOVED. SEE STRUCTURAL FOR ADD. INFO.
9	REMOVE BRICK WALL ABOVE WINDOW LINTELS.

General Removal Notes:

- A. CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS.
- B. CONTRACTOR SHALL COORDINATE REMOVALS WITH NEW CONSTRUCTION DRAWINGS AND INSURE THAT NO ITEMS OR SERVICES TO REMAIN ARE DISTURBED DURING CONSTRUCTION.
- C. CONTRACTORS SHALL BE RESPONSIBLE FOR THE PROPER STAGING OF WORK AND SHALL PROTECT ACCESS TO FIRE EGRESS PATHS, ELEVATORS, AND ADJACENT AREAS.
- D. SEE STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND CIVIL DOCUMENTS FOR ADDITIONAL WALL OR DEMOLITION REQUIREMENTS. (INCLUDING BUT NOT LIMITED TO: NEW FLUES, DUCTS, DRAINS, PIPES AND OTHER MEP EQUIPMENT.) REMOVAL DRAWINGS ARE NOT THE LIMIT OF CONTRACT FOR THE WORK.
- E. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE FIRE RATING OF ALL BUILDING ELEMENTS IN AREAS WHERE REMOVALS ARE MADE INCLUDING BUT NOT LIMITED TO DOORS, WALLS, CEILINGS, ROOFS AND STRUCTURAL ELEMENTS.
- F. REMOVE DEBRIS AND VEGETATION FROM ALL SLAB AND WALL SURFACES.
- G. REMOVE ALL EXPOSED LIGHT FIXTURES AND ELECTRICAL CONDUITS ON EXTERIOR WALLS.
- H. PORTION OR ENTIRE FLOOR TOPPING TO BE REMOVED, GC TO COORDINATE WITH STRUCTURAL AND VERIFY.

PS 186
 521 West 145th Street
 New York, New York

Boys & Girls Club of Harlem
 425 West 144th Street
 New York, New York 10001

Alembic Community Development
 11 Hanover Square, Suite 701
 New York, New York 10001

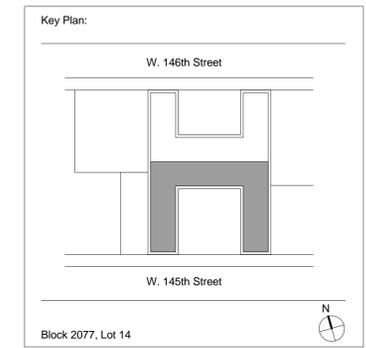
Monadnock Construction, Inc.
 155 3rd Street
 Brooklyn, New York 11231

DattnerArchitects 1385 Broadway, 15th Floor
 New York, NY 10018
 tel 212 247 2660
 info@dattner.com

Structural Engineers
 De Nardis Engineering, LLC
 15 Reservoir Road
 White Plains, NY 10603-2516

Mechanical Electrical Plumbing Engineers
 Abraham Joselow, P.C.
 45 West 34th Street Suite 1101
 New York, NY 10001

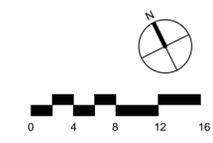
Revisions:
 Issue: DOB Permit Submission



Key Plan
 © 2014 Dattner Architects D.P.C.

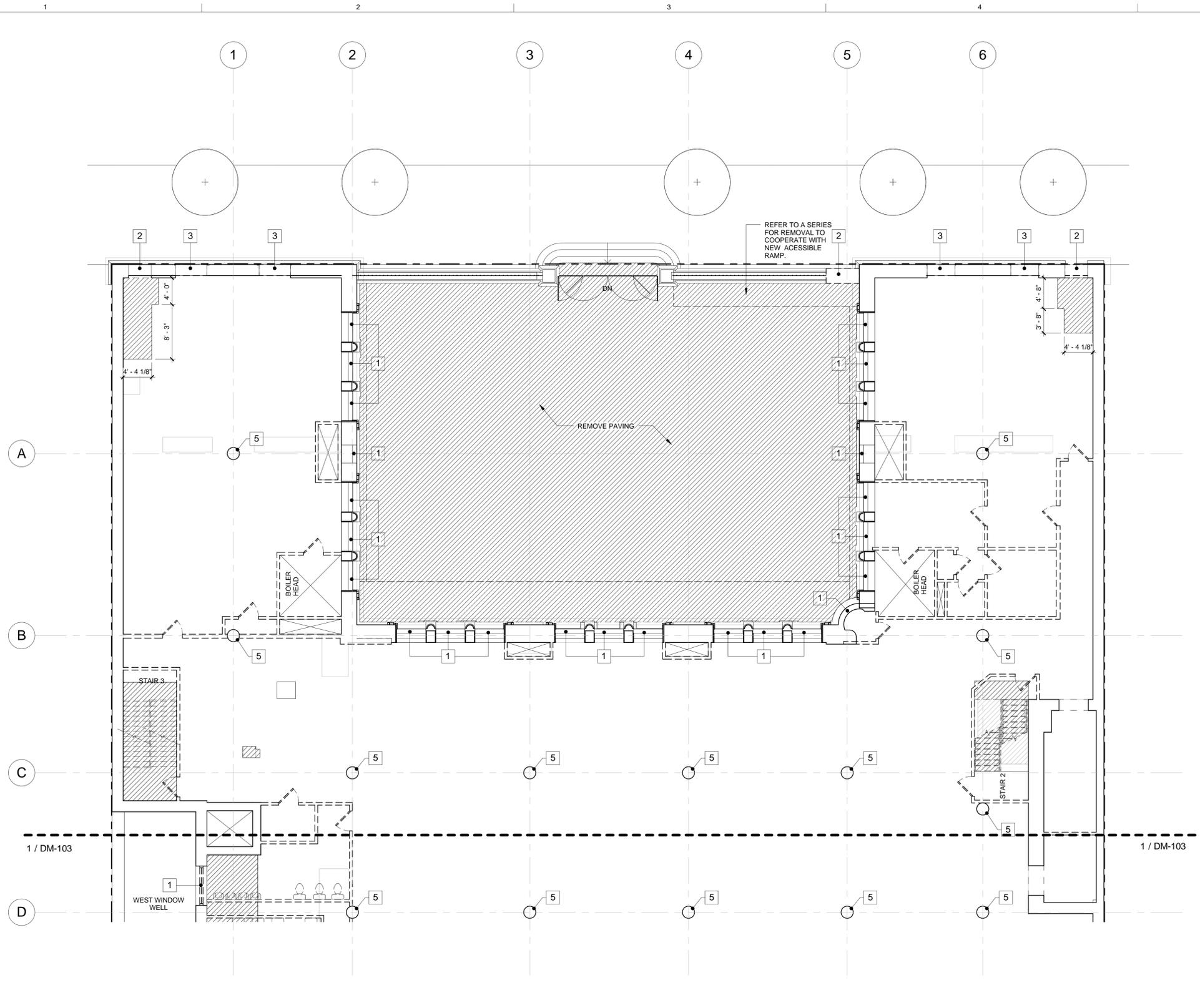
Removal Plan - Cellar - South

Date 02/14/14
 Scale 1/8" = 1'-0"
 Drawn By IP
 Checked By Checker
 Project No. 1214 Seal
 Sheet No. **DM-101.00**



1 Removal Plan - Cellar - South
 1/8" = 1'-0"

By access or receipt, the User acknowledges, consents and agrees that the documents, provided by Richard Dattner & Partners Architects (D.P.A.), including but not limited to plans and specifications, in any media (the "Documents"), are copyrighted instruments of professional services. The User agrees that the Documents may not be used for any other project or for any other purpose without the express written consent of D.P.A. The User further agrees that D.P.A. shall have no responsibility or liability in connection with the unauthorized use, reuse, change or modification of the Documents in any manner by the User or any other party accessing the Documents. No representation is made by D.P.A. as to the accuracy or use of the Documents for any other purpose. The User and any other party accessing the Documents shall be held responsible for the accuracy of the information contained therein. The User and any other party accessing the Documents shall be held responsible for the accuracy of the information contained therein. The User and any other party accessing the Documents shall be held responsible for the accuracy of the information contained therein.



1 Removal Plan - 01 North
DM-102 1/8" = 1'-0"

Removals Plan Legend

- EXISTING WALL TO REMAIN
- EXISTING SLAB OPENING
- REMOVAL
- REMOVE EXISTING SLAB & STAIR FLIGHTS, SEE STRUCTURAL TO IDENTIFY REMOVAL OF EXISTING STEEL BEAMS.
- Removal Key

Removal Key Notes

#	REMOVAL NOTES
1	REMOVE EXISTING CMU INFILL AND ANY REMAINING EXISTING WOOD WINDOW FRAME, TYP.
2	SAWCUT EXISTING STONE WALL.
3	COMPLETELY REMOVE EXISTING WOOD WINDOW FRAMES AND MULLIONS, TYP.
4	REMOVE EXISTING LIGHT FIXTURES AND CONDUITS.
5	REMOVE PLASTER AND TERRA COTTA BLOCK DOWN TO STEEL COLUMN, TYP.
6	CAREFULLY REMOVE EXISTING INFILL IN FRONT OF GATE. CAREFULLY REMOVE GATE TO REFURBISH IN THE SHOP. GC TO COORDINATE FOR REMOVAL AND STORING.
7	REMOVE EXISTING STEEL WINDOW AND STEEL BEAM CLOSURE.
8	ENTIRE ROOF SLAB TOPPING ABOVE TERRA COTTA ARCH TO BE REMOVED. SEE STRUCTURAL FOR ADD. INFO.
9	REMOVE BRICK WALL ABOVE WINDOW LINTELS.

General Removal Notes:

- A. CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS.
- B. CONTRACTOR SHALL COORDINATE REMOVALS WITH NEW CONSTRUCTION DRAWINGS AND INSURE THAT NO ITEMS OR SERVICES TO REMAIN ARE DISTURBED DURING CONSTRUCTION.
- C. CONTRACTORS SHALL BE RESPONSIBLE FOR THE PROPER STAGING OF WORK AND SHALL PROTECT ACCESS TO FIRE EGRESS PATHS, ELEVATORS, AND ADJACENT AREAS.
- D. SEE STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND CIVIL DOCUMENTS FOR ADDITIONAL WALL OR DEMOLITION REQUIREMENTS, INCLUDING BUT NOT LIMITED TO: NEW FLUES, DUCTS, DRAINS, PIPES AND OTHER MEP EQUIPMENT. REMOVAL DRAWINGS ARE NOT THE LIMIT OF CONTRACT FOR THE WORK.
- E. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE FIRE RATING OF ALL BUILDING ELEMENTS IN AREAS WHERE REMOVALS ARE MADE INCLUDING BUT NOT LIMITED TO DOORS, WALLS, CEILINGS, ROOFS AND STRUCTURAL ELEMENTS.
- F. REMOVE DEBRIS AND VEGETATION FROM ALL SLAB AND WALL SURFACES.
- G. REMOVE ALL EXPOSED LIGHT FIXTURES AND ELECTRICAL CONDUITS ON EXTERIOR WALLS.
- H. PORTION OR ENTIRE FLOOR TOPPING TO BE REMOVED, GC TO COORDINATE WITH STRUCTURAL AND VERIFY.

PS 186

521 West 144th Street
New York, New York

Boys & Girls Club of Harlem
425 West 144th Street
New York, New York 10001

Alembic Community Development
11 Hanover Square, Suite 701
New York, New York 10001

Monadnock Construction, Inc.
155 3rd Street
Brooklyn, New York 11231

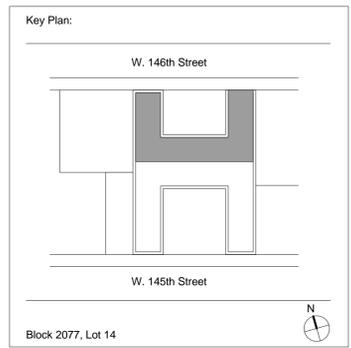
DattnerArchitects 1385 Broadway, 15th Floor
New York, NY 10018
tel 212 247 2660
info@dattner.com

Structural Engineers
De Nardis Engineering, LLC
15 Reservoir Road
White Plains, NY 10603-2516

Mechanical Electrical Plumbing Engineers
Abraham Joselow, P.C.
45 West 34th Street Suite 1101
New York, NY 10001

Revisions:

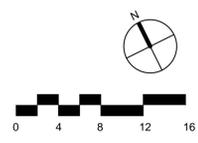
Issue: DOB Permit Submission



Key Plan
© 2014 Dattner Architects D.P.C.

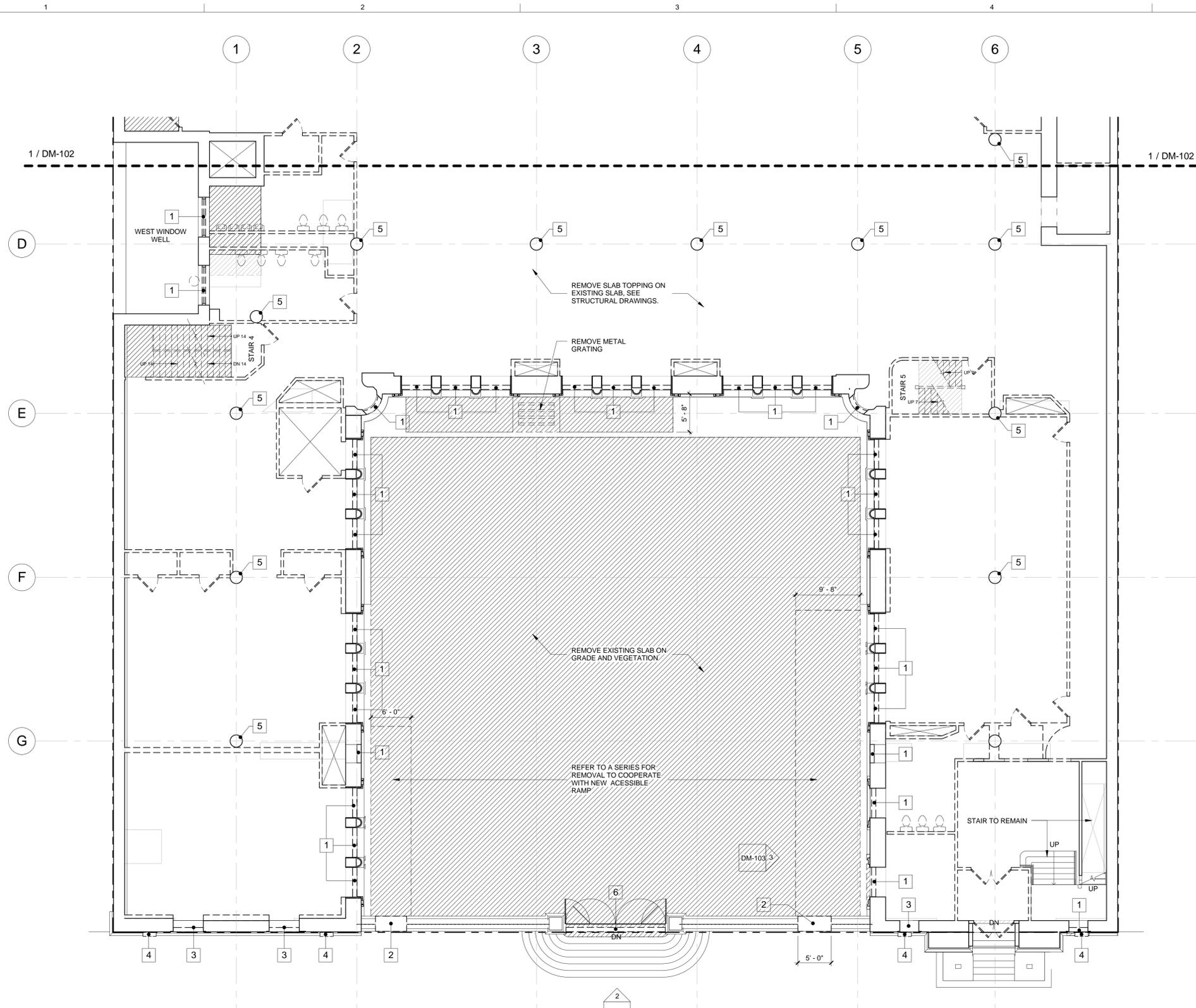
Removal Plan - Floor 01 - North

Date 02/14/14
Scale 1/8" = 1'-0"
Drawn By IP
Checked By KN
Project No. 1214 Seal
Sheet No. DM-102.00



By access or receipt, the User acknowledges, consents and agrees that the documents, provided by Richard Dattner & Partners Architects (RDP), including but not limited to plans and specifications, in any media (the "Documents"), are copyrighted instruments of professional services. The User agrees that the Documents may not be used for any other project or for any other purpose without the written consent of RDP. The User further agrees that RDP shall have no responsibility or liability in connection with the unauthorized use, reuse, change or modification of the Documents in any manner by the User or any other party accessing the Documents. No representation is made by RDP as to the accuracy or reliability of the Documents or any other party accessing the Documents. Use of the Documents is at the sole risk of the User or any other party accessing the Documents. Use of the Documents in any manner not permitted by the User or any other party accessing the Documents, including but not limited to any reproduction, distribution, modification, or use of the Documents for any purpose other than that intended by RDP, is strictly prohibited. RDP makes no warranty, either express or implied, as to the merchantability and fitness for any particular purpose.

Project: 0130014-24631 PM



Removals Plan Legend

- EXISTING WALL TO REMAIN
- EXISTING SLAB OPENING
- REMOVAL
- REMOVE EXISTING SLAB & STAIR FLIGHTS, SEE STRUCTURAL TO IDENTIFY REMOVAL OF EXISTING STEEL BEAMS.
- Removal Key

Removal Key Notes

#	REMOVAL NOTES
1	REMOVE EXISTING CMU INFILL AND ANY REMAINING EXISTING WOOD WINDOW FRAME, TYP.
2	SAWCUT EXISTING STONE WALL.
3	COMPLETELY REMOVE EXISTING WOOD WINDOW FRAMES AND MULLIONS, TYP.
4	REMOVE EXISTING LIGHT FIXTURES AND CONDUITS.
5	REMOVE PLASTER AND TERRA COTTA BLOCK DOWN TO STEEL COLUMN, TYP.
6	CAREFULLY REMOVE EXISTING INFILL IN FRONT OF GATE. CAREFULLY REMOVE GATE TO REFURBISH IN THE SHOP. GC TO COORDINATE FOR REMOVAL AND STORING.
7	REMOVE EXISTING STEEL WINDOW AND STEEL BEAM CLOSURE.
8	ENTIRE ROOF SLAB TOPPING ABOVE TERRA COTTA ARCH TO BE REMOVED. SEE STRUCTURAL FOR ADD. INFO.
9	REMOVE BRICK WALL ABOVE WINDOW LINTELS.

General Removal Notes:

- A. CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS.
- B. CONTRACTOR SHALL COORDINATE REMOVALS WITH NEW CONSTRUCTION DRAWINGS AND INSURE THAT NO ITEMS OR SERVICES TO REMAIN ARE DISTURBED DURING CONSTRUCTION.
- C. CONTRACTORS SHALL BE RESPONSIBLE FOR THE PROPER STAGING OF WORK AND SHALL PROTECT ACCESS TO FIRE EGRESS PATHS, ELEVATORS, AND ADJACENT AREAS.
- D. SEE STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND CIVIL DOCUMENTS FOR ADDITIONAL WALL OR DEMOLITION REQUIREMENTS. (INCLUDING BUT NOT LIMITED TO: NEW FLUES, DUCTS, DRAINS, PIPES AND OTHER MEP EQUIPMENT.) REMOVAL DRAWINGS ARE NOT THE LIMIT OF CONTRACT FOR THE WORK.
- E. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE FIRE RATING OF ALL BUILDING ELEMENTS IN AREAS WHERE REMOVALS ARE MADE INCLUDING BUT NOT LIMITED TO DOORS, WALLS, CEILINGS, ROOFS AND STRUCTURAL ELEMENTS.
- F. REMOVE DEBRIS AND VEGETATION FROM ALL SLAB AND WALL SURFACES.
- G. REMOVE ALL EXPOSED LIGHT FIXTURES AND ELECTRICAL CONDUITS ON EXTERIOR WALLS.
- H. PORTION OR ENTIRE FLOOR TOPPING TO BE REMOVED. GC TO COORDINATE WITH STRUCTURAL AND VERIFY.

PS 186

521 West 144th Street
New York, New York

Boys & Girls Club of Harlem
425 West 144th Street
New York, New York 10001

Alembic Community Development
11 Hanover Square, Suite 701
New York, New York 10001

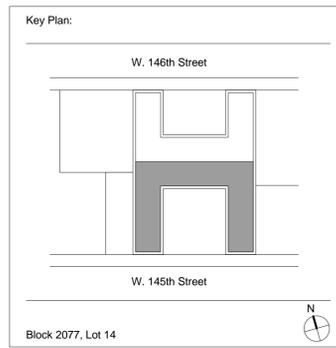
Monadnock Construction, Inc.
155 3rd Street
Brooklyn, New York 11231

DattnerArchitects 1385 Broadway, 15th Floor
New York, NY 10018
tel 212 247 2660
info@dattner.com

Structural Engineers
De Nardis Engineering, LLC
15 Reservoir Road
White Plains, NY 10603-2516

Mechanical Electrical Plumbing Engineers
Abraham Joselow, P.C.
45 West 34th Street Suite 1101
New York, NY 10001

Revisions:
Issue: DOB Permit Submission



Key Plan
© 2014 Dattner Architects D.P.C.

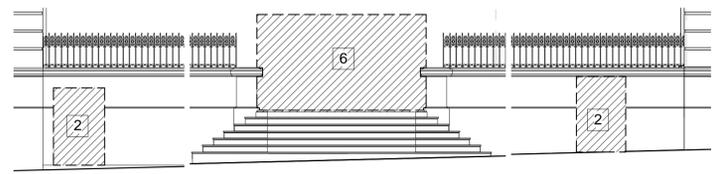
Removal Plan - Floor 01 - South

Date 02/14/14
Scale 1/8" = 1'-0"
Drawn By IP
Checked By Checker
Project No. 1214 Seal

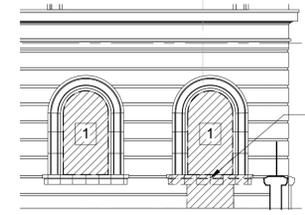


Sheet No.: **DM-103.00**

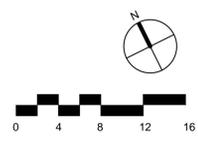
1 Removal Plan - 01 South
DM-103 1/8" = 1'-0"



2 Ret Wall Demo Partial Elevation
DM-103 1/8" = 1'-0"



3 Partial West Elevation
DM-103 1/8" = 1'-0"



General Information

Address: 521 West 145th Street, New York, NY
Block: 2077
Lot: 14
MDL Class: CAA
Stories: 5
Height: 200.51'

Zoning District: R7A, R7D, Commercial Overlay C2-4

Fire Dept Access: Use of existing windows
 - Inside Fire District
 - Building will be fully sprinklered

Occupancy and Construction Class

Occupancy: The building is classified as a Class "A" Multiple Dwelling
 Occupancy Group J-2
 (Section 27-265 NYC Building Code and Section 4, Multiple Dwelling Law)

Construction Classification: 1-C (Subchapter 4 Table 4-2 Area and Height Limitations for Sprinklered Buildings)

Occupancy Classification (Subchapter 3 Table 3-1)

Building Occupancy	Group	Fire Index
Residential	J-2 (R-2)	1

Accessory Occupancies

Accessory Occupancies	Group	Fire Index
Club	F-3 (A-3)	1
Mechanical Rooms, Laundry	D-2 (S-2)	2
Storage	B-2 (S-2)	2

Note: Occupancy class designations in parentheses are 2008 Code equivalents for the occupancy class designation of 1968 code.

NYC Energy Conservation Code

ECCNY 2010 exempts for building certified as eligible for national or state designated historic building. The existing building is in process of application for listing on national Registry of Historic Places, and conditional approval is obtained.

Special Inspections

BC 907,...	Fire Alarm Test
BC 1704.3.1	Structural Steel - Welding
BC 1704.3.2, B...	Structural Steel - Erection & Bolting
BC 1704.4	Concrete - Cast-In-Place
BC 1704.5	Masonry
BC 1704.15	Mechanical System
BC 1704.19	Structural Safety - Structural Stability
BC 1704.21	Sprinkler System
BC 1704.22	Standpipe System
BC 1704.23	Heating System
BC 1704.25	Firestop, Draftstop, and Fireblock systems
BC 1905.6	Concrete Test Cylinders
BC 1905.3	Concrete Design Mix

Progress Inspections

BC 109.3.4	Fire-Resistance Rated Construction
BC 109.3.1	Footing and Foundation

Separate Applications

Alteration Type I - Fire Alarm, Fire Protection Plan

Building Department Notes

The existing building was constructed under pre-2008 code. At the option of owner, the 1968 building code, including provisions that allow in certain instances the use if the 1938 Code, is used for alteration of the existing building per article 101, 28-101.4.3/ chapter 1 of the 2008 building code of the City of New York except that the following must comply with the 2008 Code.

- Administration, including:
 - Fees
 - Approval of construction documents
 - Issuance of permits
 - Special inspections
 - Use of materials
- Enforcement, violations, fines, penalties
- Safety of public and property during construction (BC Chapter 33)
- Plumbing work (PC)
- Fuel gas work (FGC)
- Mechanical work (MC)
- Fire protection (BC Chapter 9)
- Elevators (BC Chapter 30)
- Accessibility for the entire building as if hereafter erected when exceeding 50% of building value or when changing the main use or dominant occupancy (BC Chapter 11)
- Encoachments into the public right of way (BC Chpater 32)

General Notes:

- Permits and compliance: All work shall conform to and be performed in strict accordance with the Contract Documents, the 1968 Building Code with exceptions listed conditions in Building Department Notes above, Electrical Code of City of New York (EC), the New York City Housing Maintenance Code (HMC), the New York State Multiple Dwelling Law (MDL), and all other regulations having jurisdiction. The Contractor shall obtain all required permits prior to commencement of the work.
- Conditions affecting the work: Before proceeding with the work, the Contractor and sub-contractors shall thoroughly examine conditions at the project site to assure that the work can proceed in accordance with the contract documents. Conditions found which will adversely affect the work shall be reported to the Owner's Representative and the architect prior to proceeding with the work.
- Notification of adjacent property owners: Five days prior notice shall be given by the Contractor to the owner of each adjoining lot affected by foundation, earthwork or demolition work as per Sec. 27-165 and 27-169 of the Code.
- Commencement of operations: At least 24 hours written notice shall be given by the contractor to the commissioner of buildings before commencing of work. special inspection items require 72 hours prior written notice to persons responsible for inspection (BC Chapter 1, sec. 28-116.2.3)
- Reference datum: Elevations refer to North American vertical datum of 1988 (NAVD) per NYC Local Law 96 of 2013.
- Site elevations shown refer to datum indicated on the survey. Project elevation 0'-0" = 126.4' (F.F.E.)
- Survey: Survey is provided for information only. Dattner Architects is not responsible for the accuracy or completeness of information contained in the survey or test borings prepared by others.
- Dimensions: Unless otherwise shown or indicated, dimensions shown on architectural plan drawings are indicated from finish to finish. Thickness of applied wall finishes are indicated on details and elsewhere in the contract documents.
- Dimensions verification: Before proceeding with the work, the contractor and sub-contractors shall verify elevation datum and all dimensions. Any dimensional variations between field conditions and proposed new work which will adversely affect the work shall be reported to the owner's representative and the architect prior to proceeding with the work. Do not scale drawings; written dimensions take precedence.
- Construction classification: The construction classification of this building is construction group "I" non-combustible, class "I-C". All construction elements shall be of the required minimum fire resistance ratings outlined in Table 3-4 and elsewhere in the code.
- Separation of Occupancies: Provide fire separations or divisions between various occupancies as per Sec. 27-339-340 Code.
- Rated Assemblies: All materials or assemblies required to have a fire resistance rating shall comply with the appropriate NYC Bldg. Dept. reference standard.
- Materials, assemblies, equipment and methods of construction and service equipment shall meet the following requirements:
 - They shall have been acceptable prior to the effective date of the code by the Board of Standards and Appeals, or,
 - They shall have been accepted for use under the prescribed test methods by the Commissioner, or,
 - Approved by the Board of Standards and Appeals as per Sec. 27-130 and 27-131 of the Code.
- Masonry units shall conform to the Code and with BSA and MEA approvals. Masonry walls and construction shall conform to RS-10 1 of the Code. See Structural Drawings for additional information.
- Special inspection: Provide testing and inspections required by BCchapter 11.
- Firestopping - general: Concealed spaces with partitions, walls, floors, roofs, stairs, furring, pipe spaces, column enclosures, etc., shall be firestopped (except where concealed space is sprinkled) with non-combustible material that can be shaped, fitted and permanently secured in position as per Sec. 27-345
- Shaft enclosure: Stair, elevator and shaft enclosures shall have a 2 hour fire-resistance rating, complying with the Code.
- Firestopping, ducts, pipes, conduits: Duct, pipes and conduits passing through fire rated construction shall have surrounding spaces not exceeding 1/2" in width packed with firestopping material approved by the code and closed off with close-fitting metal closers. ductwork penetrations shall be protected by rated self-closing devices, per Sec. 27-343.
- Elevators shall be filed as a separate NYC Bldg. Dept. application by the Contractor. Elevators shall comply with ANSI standards. All openings to elevator shaft shall be provided with self-closing doors and bucks having a 1-1/2 hour rating. All doors to elevator shafts and doors in elevator cabs to be provided with automatic devices as required by chapter 30 and appendix K of the 2008 NYC Building code. Elevators and accessories shall comply with the requirements for the handicapped and the firemen's recall system. Provide mirrors in elevator cabs (Sec. 51-b MDL & 27-2041 HMC).
- Work beyond street line: No work shall be performed beyond the street line prior to obtaining approval from NYC Dept. of Transportation (DOT). Permits for all work outside of the NYC street line shall be obtained by the contractor. Sidewalks and street curbing shall be rebuilt in accordance with the requirements of NYC DOT.
- Noise control: The work shall comply with requirements for noise control in multiple dwellings (Secs. 27-768m 769, 770 Code and sec. 84 MDL).
 - Air borne noise: walls, partitions, floor ceiling const. separating dwelling units - STC 50. dwelling unit entrance doors - STC 35.
 - Structure borne noise: floor-ceiling const. separating dwelling units shall have a min. noise impact rating (INR) = 0 (zero).
 - Mechanical equipment noise: shall comply with sec. 27-770 Code.

Fire Resistance Ratings

In conformance with section 27-277 and Table 3-4.

Summary of table 3-4 for class 1-C construction below for general reference only. See table 3-4.

Building is equipped throughout with an automatic sprinkler system.

CONSTRUCTION ELEMENT	RATING IN HOURS
ENCLOSURES OF VERTICAL EXITS, EXIST PASSAGEWAYS, HOISTWAYS AND SHAFTS	2 HRS
COLUMNS, GIRDERS, TRUSSES (OTHER THAN ROOF TRUSSES) AND FRAMING - SUPPORTING ONE FLOOR	1 1/2 HRS
COLUMNS, GIRDERS, TRUSSES (OTHER THAN ROOF TRUSSES) AND FRAMING - SUPPORTING MORE THAN ONE FLOOR	2 HRS
STRUCTURAL MEMBERS SUPPORTING A WALL	SAME AS REQUIRED FIRE RESISTANCE OF WALL SUPPORTED, BUT NOT LESS THAN RATING REQUIRED FOR MEMBER BY THE CLASS OF CONSTRUCTION
FLOOR CONSTRUCTION INCLUDING BEAMS	1 1/2 HRS
ROOF CONSTRUCTION: INCLUDING BEAMS, TRUSSES, AND FRAMING	1 HRS
15'-0" OR LESS IN HEIGHT ABOVE FLOOR TO LOWEST MEMBER	
EXTERIOR LOAD BEARING WALL	2 HRS

- Flame-spread and Smoke density for fully sprinklered building
 - Flame spread ratings shall comply with C27-348, Code.
 - Interior finish: Residential and community areas class B, 26-75 flame spread ratings for exits, shafts, corridors, and all community use rooms on cellar floor. Upto 20% of the aggregate wall and ceiling maybe finished with class C, 76-225 flame speed.
 - Class C or better, 76-225 flame spread rating within apartments.
 - Smoke density: No material shall be used for interior finish of exits or corridors that has a smoke developed rating greater than 25. as per c27-248(d), code.
- Intercom system: Directory with intercom system at ground floor lobby shall have connection to speaker in each apartment. speaker in each apartment shall communicate with announcement in vestibule.
- Structural: For notes referring to live and dead loads, structural work, foundations, concrete and masonry refer to structural drawings.
- Minimum Clear Story Height: Finished floor to finished ceiling in habitable rooms shall be 8'-0" min.
- Signs at Stairs and Elevators: Signs shall be posted at stairs and elevators to comply with Sections 27-390, -391, -392, -393 and 395 of Code.
- Temporary Sheet Piling and Underpinning All sheet piling and underpinning work shall be designed & supervised by a professional engineer licensed in New York State retained by the contractor, acceptable to the engineer of record, filed with & approved by the New York City Department of Buildings.
- Sprinklers: Entire building shall be sprinklered. See sprinkler drawings. Provide gypsum board enclosure wherever sprinkler pipes run through occupied space, public space or corridors.
- Excavation: Comply with OPPN #26/ 92. If any off-site fill or on-site fill in excess of 300 cubic yards is anticipated. The registered architect shall place the following note on the note sheet, " This Project Requires Fill" which shall comply with fill material Section 16-130a(4) A.C and rules the regulations for operations, Section 16-131 A.C for fill material operation.

Multiple Dwelling and Housing Maintenance Code Notes

- Dwelling unit door hardware: Doors to dwelling units shall be equipped with heavy duty lock and dead bolt operable by key from outside and thumb turn from inside. Doors shall be equipped with chain guard and view device (BC 1008.4.2, Sec. 51-a MDL & Sec. 27-2043 HMC).
- Building entrance doors: Shall contain at least 5 sq. ft. glazed area, exterior lighting of entrance area will be provided. (Sec. 35, MDL & 27-2040 HMC).
- Chimney: The work shall comply with BC Table 601 and Mechanical Code, Chapter 8. Enclosure of interior metal chimney shall be 2 hr. rated.
- Mechanical Ventilation
 - Mechanical ventilation systems shall comply with the 2008 City of New York Mechanical Code.
 - Bathrooms in dwelling units shall be ventilated in accordance with BC 1203.4.1.3, Sec. 30, 76 MDL and 27-2065 HMC.
- Light, Heat and Ventilation
 - Minimum room dimensions meet C27-751 code, Sec. 31 MDL and Sec. 27-2074 HMC.
 - Apartment windows shall conform to C-27-733 code and BC 1203.4; have a transmittal area equal to 10% of room area; and have an operable area equal to 5% of the room area (Sec. 31 to 5 MDL).
 - Heating requirements shall comply with BC 1204 and Sec. 79 MDL.
 - Stairs and public halls shall be artificially lit per Sec. 37 MDL and 27-2038-9 HMC.

PS 186 Gross Floor Area

Gross Area Calculations			
Floor	BGCH Area	Residential Area	Total Area
Cellar	879 SF	14,777 SF	15,656 SF
01	9,954 SF	9,291 SF	19,245 SF
02	0 SF	19,165 SF	19,165 SF
03	0 SF	19,165 SF	19,165 SF
04	0 SF	19,165 SF	19,165 SF
05	0 SF	19,165 SF	19,165 SF
Grand total:	10,833 SF	100,730 SF	111,563 SF

PS 186 Dwelling Unit Tabulation

Residential Unit Count				
Floor	0 BR	1 BR	2 BR	Total
Floor 1	0	6	0	6
Floor 2	6	11	3	20
Floor 3	7	9	4	20
Floor 4	4	9	4	17
Floor 5	8	8	4	20
Totals	25	43	15	83
Unit %	30	52	18	100

- Smoke Detectors: Hardwired smoke detectors shall be provided in dwelling units and mechanical/electrical rooms per BC 907.2.10.1.1 and 27-2045 HMC. in dwellings, SD's shall be no more than 15'-0" from bedroom door.
- Carbon Monoxide Detectors: Hardwired carbon monoxide detectors shall be provided in dwelling units and boiler and gas meter rooms (BC 908.7 and 27-2045 HMC). In dwellings, CMD's shall be no more than 15'-0" from bedroom door.
- Building and Maintenance
 - Combustible material within 1 ft. of cooking apparatus shall be fire protected as req'd. There shall be at least 2 ft. clear above cooking surface (Sec. 23 MDL and 27-2072 HMC).
 - Provide fire code type gyp. bd. for kitchen walls and ceilings (Sec. 3b MDL and 27-2072 HMC).
 - Installation of antenna, etc. shall comply with Sec. 62 MDL.
 - Roofs are provided with metal railings or masonry parapets (Sec. 62 MDL).
 - Rodent-Proofing. Building shall comply with BC Appendix F, Rodent-Proofing and Sec. 80 MDL.
 - Owner will comply with maintenance requirements (Sec. 80 MDL) and will provide janitorial services (Sec. 83 MDL and sub-2 art. 13 HMC).
 - Mailboxes are provided in building lobby (Sec. 57 MDL & 27-2044 HMC) room plan and notes
 - Floor signs and street numbers are provided (Sec. 27-2048.9 HMC).

Refuse Chute And Compactor:

- Refuse chute and Refuse Storage room to comply with Sec. 81 MDL and BC 1213.
- Refuse Storage room shall be completely enclosed 2-hr fire rating with self closing protectives having a fire protection rating of 1 1/2 hr to comply with BC 1213.1
- A refuse compacting system is required for multiple dwellings with an R-2 occupancy, four or more stories in height, and more than 12 dwelling units to comply with BC 1213.2. This system is located in a refuse chute termination room constructed with a fire resistance rating of 3hrs with self closing protectives having a fire protection rating of 1 1/2 hr to comply with both BC 1213.2 and BC 707.13.4. The floor is constructed of concrete and sloped to a floor drain connected to the building sewer to comply with BC 1213.2. A hose connection is provided in this room.
- Access openings for refuse chutes are located in dedicated rooms completely enclosed with 2-hr fire rating with self closing protectives having a fire protection rating of 1 1/2 hr to comply with BC 707.13.3.
- Refuse chute has an a shaft enclosure with 2-hr fire rating with self closing opening protectives to comply with BC 707.13.1.
- Pest control: the owner shall establish a program to prevent infestation of refuse collection system by insects or rodents and shall maintain records of treatments.
- Charging chute to comply with noise control requirements of BC 1207.
- Where refuse flows directly into compacting equipment the equipment may be used in place of the hopper and cut off door. compacting equipment shall operate automatically when the level of refuse is not more than three feet below the lowest hopper door.
- Maintenance: refuse chute, refuse rooms, hoppers and all parts of the refuse collecting system shall be maintained in a clean and sanitary condition at all times, free of vermin, odors and defects and good operating condition.

Fixture Count for Club

Fixture counts in conformance with Section 403.2, 403.3 and table 403.1

	Water Closet		Lavatories		Drinking Fountains
	Male	Female	Male	Female	
Required	1	2	1		1
Provided	3	3	6		1

Fixture Count for Residential

Minimum one water closet, one lavatory, one bathtub or shower, one kitchen sink are required. (Complies)

PS 186

521 West 145th Street
 New York, New York

Boys & Girls Club of Harlem
 425 West 144th Street
 New York, New York 10001

Alembic Community Development
 11 Hanover Square, Suite 701
 New York, New York 10001

Monadnock Construction, Inc.
 155 3rd Street
 Brooklyn, New York 11231

DattnerArchitects

1385 Broadway, 15th Floor
 New York, NY 10018

tel 212 247 2660
 info@dattner.com

Structural Engineers

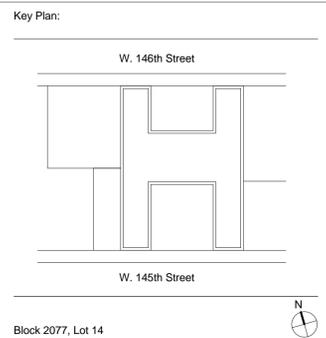
De Nardis Engineering, LLC
 15 Reservoir Road
 White Plains, NY 10603-2516

Mechanical Electrical Plumbing Engineers

Abraham Joselow, P.C.
 45 West 34th Street Suite 1101
 New York, NY 10001

Revisions:

Issue: DOB Permit Submission



Key Plan

© 2014 Dattner Architects D.P.C.

General Notes & Special Inspections

Date 02/14/14

Scale As indicated

Drawn By JC

Checked By JC/ KN

Project No. 1214 Seal

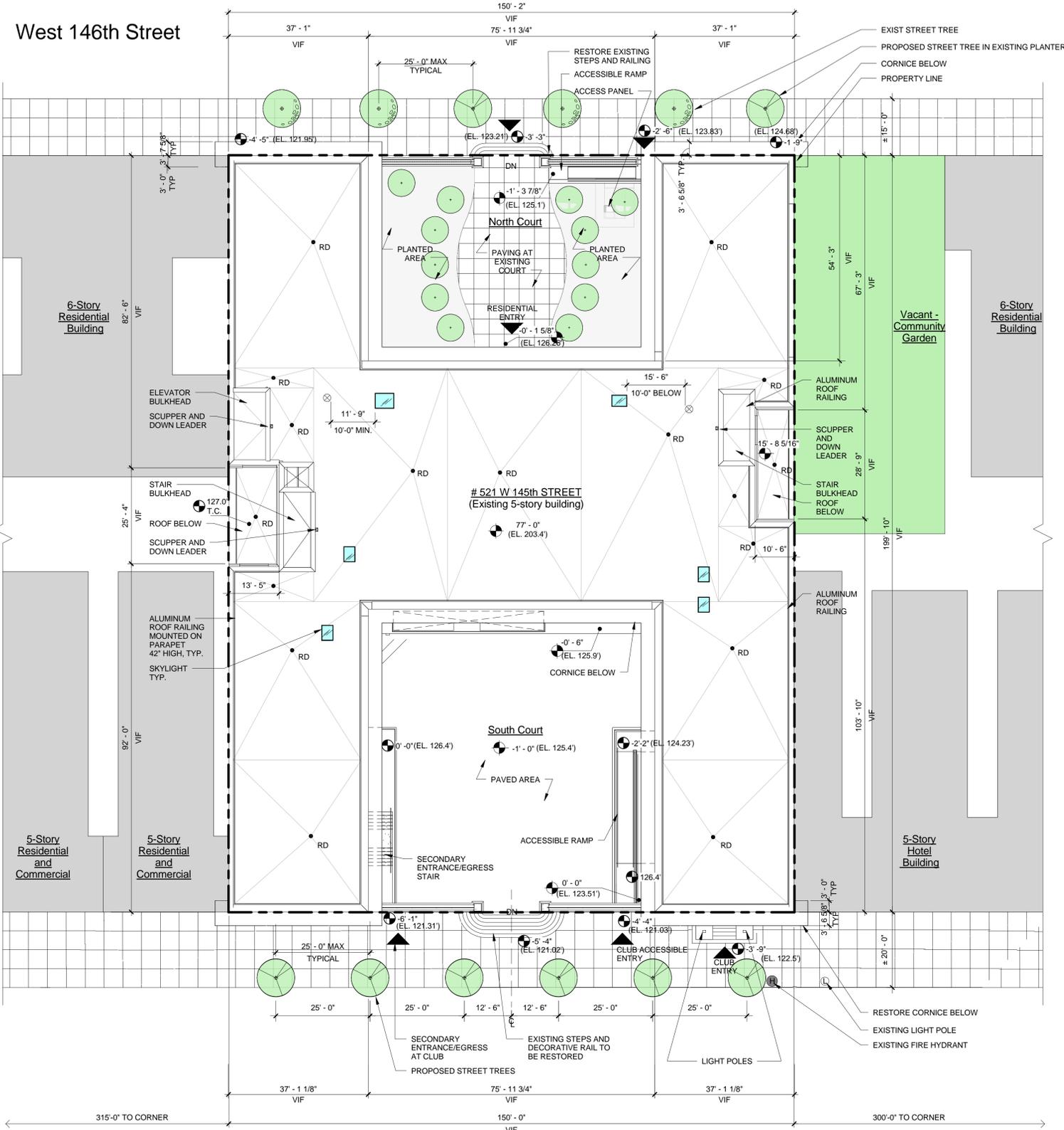
Sheet No.:



A-002.00

By review or check, the User acknowledges, consents and agrees that the documents, provided by Richard Dattner & Partners Architects (DPA), including but not limited to plans and specifications, in any media the "Documents" are copyrighted instruments of professional services. The User agrees that the Documents may not be used for any other project or for any use not expressly authorized in writing by DPA. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change. The User assumes all responsibility for the use of the Documents and for any errors or omissions in the Documents. The User further agrees that DPA has no responsibility or liability in connection with the manufacture, transmission, distribution, reproduction, or use of the Documents in any form or by any means, including electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of DPA. No representation is made by DPA as to the accuracy or completeness of the information contained in the Documents or that the information is up to date or that the information is not subject to change

By access or receipt, the User acknowledges, consents and agrees that the documents, provided by Richard Dattner & Partners Architects (DPA), including but not limited to plans and specifications, in any media, the "Documents", are copyrighted instruments of professional services. The User agrees that the Documents may not be used for any other project or for any use not expressly authorized by DPA. The User further agrees that DPA and its affiliates shall have no responsibility or liability in connection with the unauthorized use, reproduction, distribution, or disclosure of the Documents. No representation is made by DPA as to the accuracy or completeness of the Documents. The User and any other party accepting the Documents, shall be deemed to have accepted the Documents as they are and shall be responsible for any errors, omissions, or inaccuracies. The User and any other party accepting the Documents, shall be deemed to have accepted the Documents as they are and shall be responsible for any errors, omissions, or inaccuracies. The User and any other party accepting the Documents, shall be deemed to have accepted the Documents as they are and shall be responsible for any errors, omissions, or inaccuracies.



LEGEND

- PROPERTY LINE
- EXISTING TREE
- PROPOSED TREE
- ▲ BUILDING ENTRANCE
- NEIGHBORING BUILDING
- SKYLIGHT

NOTES

1. Flood Zone: See G-002 for the flood district information.

PS 186

521 West 145th Street
New York, New York

Boys & Girls Club of Harlem
425 West 144th Street
New York, New York 10001

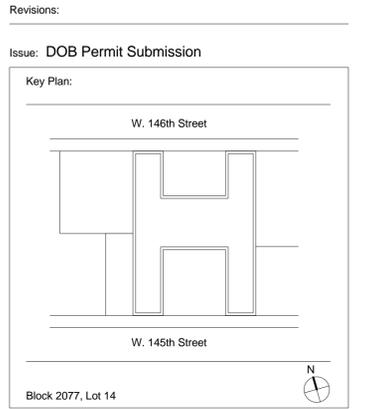
Alembic Community Development
11 Hanover Square, Suite 701
New York, New York 10001

Monadnock Construction, Inc.
155 3rd Street
Brooklyn, New York 11231

DattnerArchitects 1385 Broadway, 15th Floor
New York, NY 10018
tel 212 247 2660
info@dattner.com

Structural Engineers
De Nardis Engineering, LLC
15 Reservoir Road
White Plains, NY 10603-2516

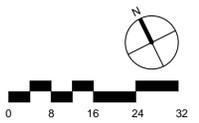
Mechanical Electrical Plumbing Engineers
Abraham Joselow, P.C.
45 West 34th Street Suite 1101
New York, NY 10001



Key Plan
© 2014 Dattner Architects D.P.C.

Site Plan

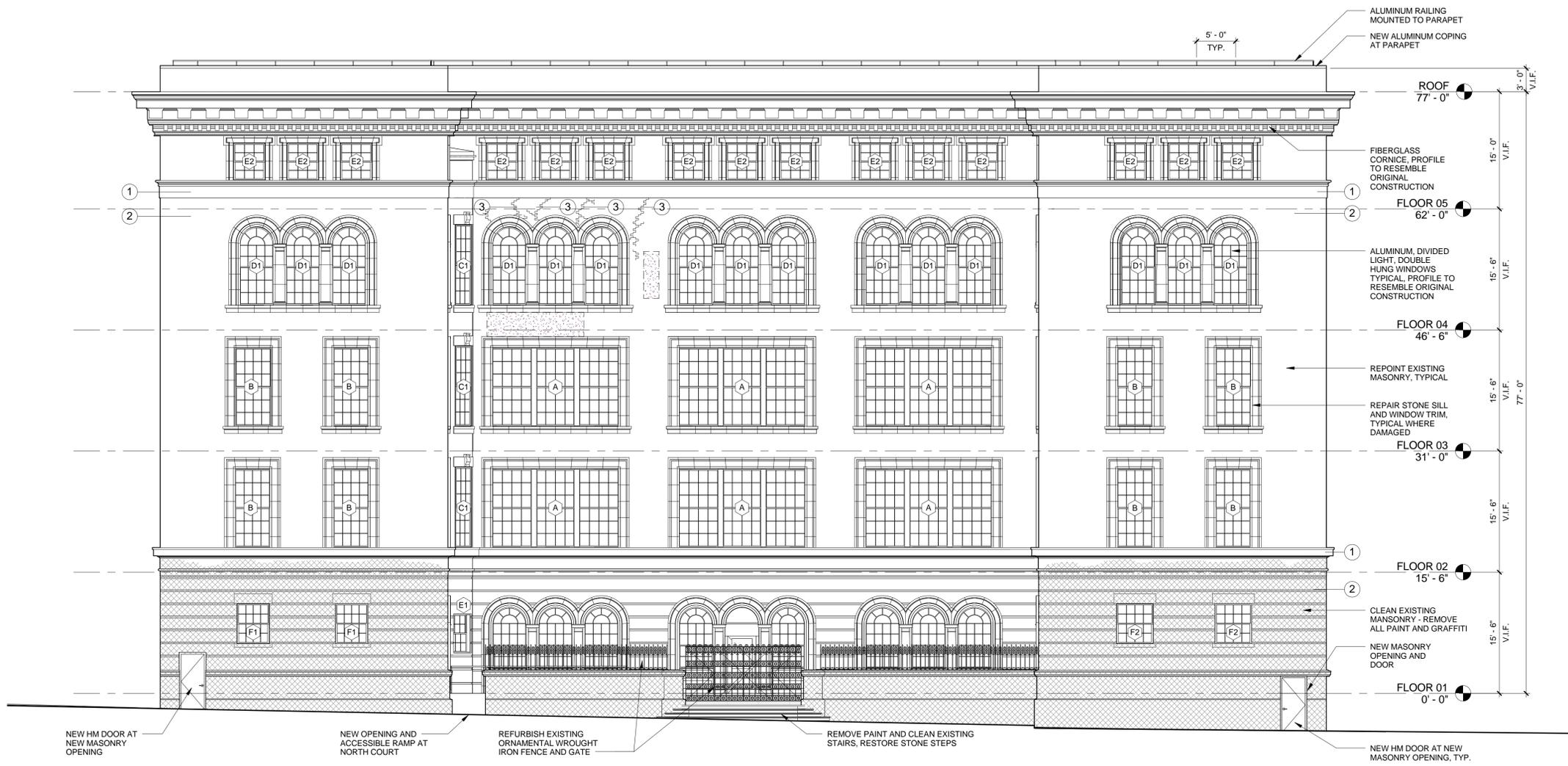
Date 02/14/14
Scale As indicated
Drawn By YJC
Checked By KN,JC
Project No. 1214 Seal
Sheet No.:



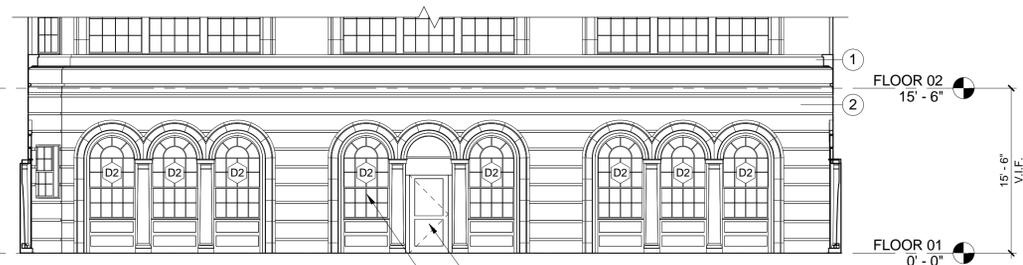
1 Site Plan
A-020 1/16" = 1'-0"

A-020.00

By access or receipt, the User acknowledges, consents and agrees that the documents, provided by Richard Dattner & Partners Architects (D.P.A.), including but not limited to plans and specifications, in any media, the "Documents", are copyrighted instruments of professional services. The User agrees that the Documents may not be used for any other project or for any use not expressly authorized by D.P.A. The User further agrees that D.P.A. shall have no responsibility or liability in connection with the reproduction, distribution, or use of the Documents in any media, the "Documents", for any purpose other than that intended by D.P.A. The User agrees that the Documents are the property of D.P.A. and shall remain the property of D.P.A. until such time as they are returned to D.P.A. in accordance with the terms of the agreement. The User agrees that the Documents are the property of D.P.A. and shall remain the property of D.P.A. until such time as they are returned to D.P.A. in accordance with the terms of the agreement. The User agrees that the Documents are the property of D.P.A. and shall remain the property of D.P.A. until such time as they are returned to D.P.A. in accordance with the terms of the agreement.



1 North Elevation
A-200 1/8" = 1'-0"



2 North Elevation
A-200 1/8" = 1'-0"

Construction Elevation Legend

- EXISTING MASONRY/STONE WALL CONSTRUCTION
- FACE BRICK TO MATCH COLOR, TEXTURE, AND MORTAR WITH EXISTING
- EXISTING DAMAGED MASONRY & MORTAR JOINTS - POINT LOOSE JOINTS
- EXISTING DAMAGED STONE - PATCH OR REPLACE.
- AREAS WITH PAINT & GRAFFITI - TO BE CLEANED
- RESTORATION KEY

Restoration Key Notes

#	RESTORATION NOTES
1	CLEAN EXISTING LIMESTONE OR TERRA COTTA
2	CLEAN EXISTING MASONRY
3	EXIST CRACKED MASONRY - REPAIR, REPOINT
4	BRICK INFILL TO MATCH EXISTING SIZE, COLOR, TEXTURE AND UNIT DIMENSION.

General Restoration Notes

- A. REMOVE GRAFFITI AND PAINT FROM ALL BRICK AND LIME STONE SURFACES.
- B. EXISTING BRICK, LIMESTONE SILLS, TRIMS AND MOULDINGS TO BE CLEANED WITH LOW PRESSURE WATER.
- C. REPAIR ALL CRACKED AND SPALLING MASONRY RESULTING FROM REMOVAL OF EXISTING ATTACHMENTS.
- D. NEW BRICK INSTALLED TO MATCH EXISTING IN SIZE, COLOR, TEXTURE, AND UNIT DIMENSION.
- E. REPAIR LIMESTONE WINDOW TRIM, SILLS WHERE DAMAGED.
- F. NEW ALUMINUM WINDOWS TO RESEMBLE HISTORICAL WOOD FRAMES AND MUNTINS.
- G. NEW EXTERIOR ALUMINUM STOREFRONT DOORS TO RESEMBLE HISTORICAL WOOD DOORS.
- H. INSTALL NEW FIBERGLASS CORNICE TO RESEMBLE PROFILE, COLOR, TEXTURE OF THE ORIGINAL.

PS 186

521 West 145th Street
New York, New York

Boys & Girls Club of Harlem
425 West 144th Street
New York, New York 10001

Alembic Community Development
11 Hanover Square, Suite 701
New York, New York 10001

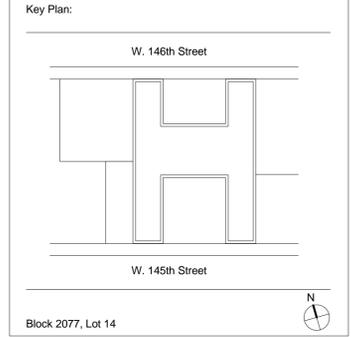
Monadnock Construction, Inc.
155 3rd Street
Brooklyn, New York 11231

DattnerArchitects 1385 Broadway, 15th Floor
New York, NY 10018
tel 212 247 2660
info@dattner.com

Structural Engineers
De Nardis Engineering, LLC
15 Reservoir Road
White Plains, NY 10603-2516

Mechanical Electrical Plumbing Engineers
Abraham Joselow, P.C.
45 West 34th Street Suite 1101
New York, NY 10001

Issue: DOB Permit Submission



Key Plan
© 2014 Dattner Architects D.P.C.

Building Elevation - North

Date 02/14/14

Scale 1/8" = 1'-0"

Drawn By IP

Checked By KN,JC

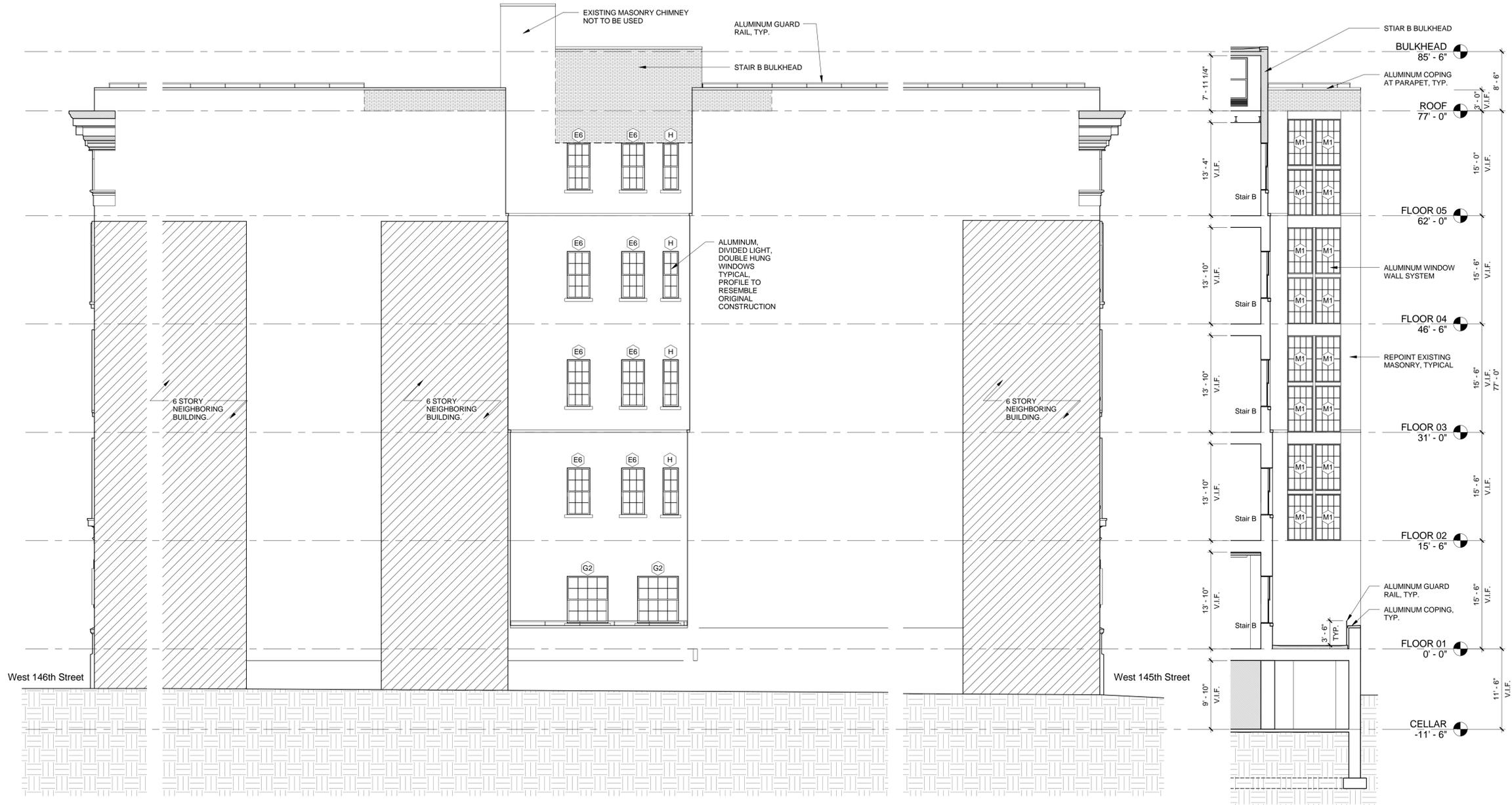
Project No. 1214 Seal

Sheet No.:



A-200.00

By access or receipt, the User acknowledges, consents and agrees that the documents, provided by Richard Dattner & Partners Architects (D.P.A.), including but not limited to plans and specifications, in any media the "Documents", are copyrighted instruments of professional services. The User agrees that the Documents may not be used for any other project or for any use not expressly authorized by D.P.A. The User further agrees that D.P.A. shall have no responsibility or liability in connection with the unauthorized use, reproduction, distribution, or disclosure of the Documents. No representation is made by D.P.A. as to the accuracy or completeness of the Documents. The User and any other party accepting the Documents, shall be deemed to have accepted the Documents and to have agreed to indemnify and hold D.P.A. harmless from and against all claims, damages, losses, costs, expenses, and attorney's fees, including reasonable attorney's fees, that may be incurred by D.P.A. in connection with the unauthorized use, reproduction, distribution, or disclosure of the Documents. The User and any other party accepting the Documents, shall be deemed to have accepted the Documents and to have agreed to indemnify and hold D.P.A. harmless from and against all claims, damages, losses, costs, expenses, and attorney's fees, including reasonable attorney's fees, that may be incurred by D.P.A. in connection with the unauthorized use, reproduction, distribution, or disclosure of the Documents.



1 Wes Building Elevation
 A-205 1/8" = 1'-0"

2 West Light Well Elevation - North
 A-205 1/8" = 1'-0"

Construction Elevation Legend

- EXISTING MASONRY/STONE WALL CONSTRUCTION
- FACE BRICK TO MATCH COLOR, TEXTURE, AND MORTAR WITH EXISTING
- EXISTING DAMAGED MASONRY & MORTAR JOINTS - POINT LOOSE JOINTS
- EXISTING DAMAGED STONE - PATCH OR REPLACE.
- AREAS WITH PAINT & GRAFFITI - TO BE CLEANED
- RESTORATION KEY

Restoration Key Notes

#	RESTORATION NOTES
1	CLEAN EXISTING LIMESTONE OR TERRA COTTA
2	CLEAN EXISTING MASONRY
3	EXIST CRACKED MASONRY - REPAIR, REPOINT
4	BRICK INFILL TO MATCH EXISTING SIZE, COLOR, TEXTURE AND UNIT DIMENSION.

General Restoration Notes

- A. REMOVE GRAFFITI AND PAINT FROM ALL BRICK AND LIME STONE SURFACES.
- B. EXISTING BRICK, LIMESTONE SILLS, TRIMS AND MOULDINGS TO BE CLEANED WITH LOW PRESSURE WATER.
- C. REPAIR ALL CRACKED AND SPALLING MASONRY RESULTING FROM REMOVAL OF EXISTING ATTACHMENTS.
- D. NEW BRICK INSTALLED TO MATCH EXISTING IN SIZE, COLOR, TEXTURE, AND UNIT DIMENSION.
- E. REPAIR LIMESTONE WINDOW TRIM, SILLS WHERE DAMAGED.
- F. NEW ALUMINUM WINDOWS TO RESEMBLE HISTORICAL WOOD FRAMES AND MUNTINS.
- G. NEW EXTERIOR ALUMINUM STOREFRONT DOORS TO RESEMBLE HISTORICAL WOOD DOORS.
- H. INSTALL NEW FIBERGLASS CORNICE TO RESEMBLE PROFILE, COLOR, TEXTURE OF THE ORIGINAL.

PS 186

521 West 145th Street
New York, New York

Boys & Girls Club of Harlem
425 West 144th Street
New York, New York 10001

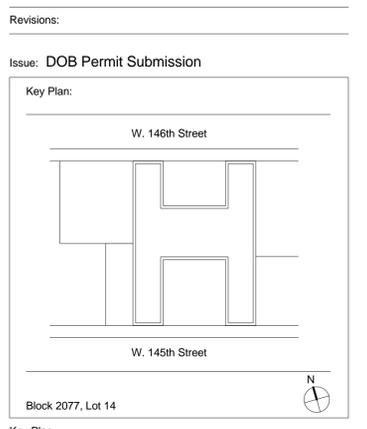
Alembic Community Development
11 Hanover Square, Suite 701
New York, New York 10001

Monadnock Construction, Inc.
155 3rd Street
Brooklyn, New York 11231

DattnerArchitects 1385 Broadway, 15th Floor
New York, NY 10018
tel 212 247 2660
info@dattner.com

Structural Engineers
De Nardis Engineering, LLC
15 Reservoir Road
White Plains, NY 10603-2516

Mechanical Electrical Plumbing Engineers
Abraham Joselow, P.C.
45 West 34th Street Suite 1101
New York, NY 10001



Key Plan
© 2014 Dattner Architects D.P.C.

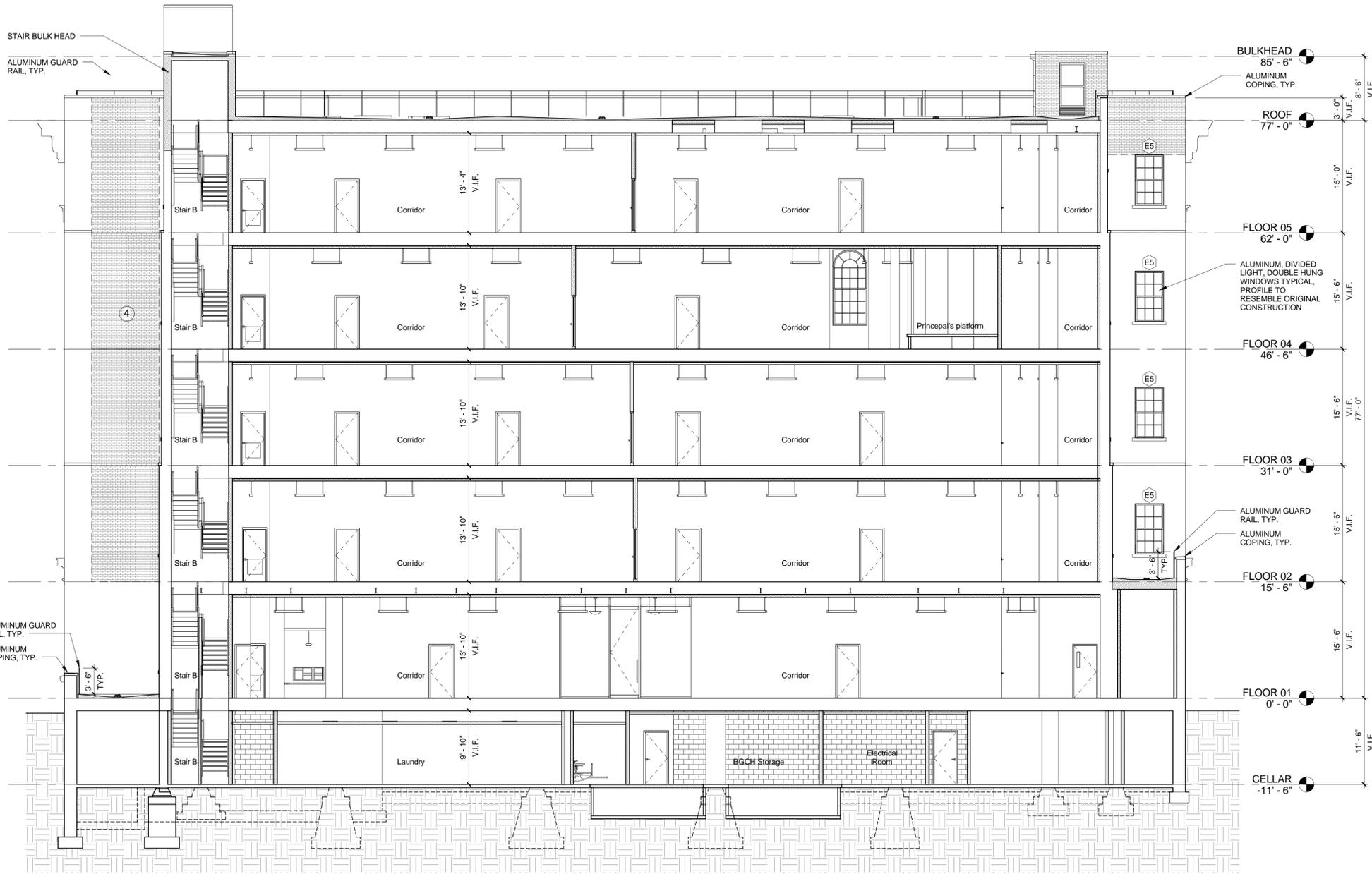
Building West Elevation & Light Well

Date 02/14/14
Scale 1/8" = 1'-0"
Drawn By IP
Checked By Checker
Project No. 1214 Seal
Sheet No. A-205.00



A-205.00

By access or receipt, the User acknowledges, consents and agrees that the documents, provided by Richard Dattner & Partners Architects (DTPA), including but not limited to plans and specifications, in any media, the "Documents", are copyrighted instruments of professional services. The User agrees that the Documents may not be used for any other project or for any use not expressly authorized by DTPA. The User further agrees that DTPA shall have no responsibility or liability in connection with the unauthorized use, reproduction, distribution, or disclosure of the Documents. No representation is made by DTPA as to the accuracy or reliability of the Documents or any information contained therein. The User and any other party accepting the Documents, shall be deemed to have agreed to the terms and conditions set forth herein and to hold DTPA, its partners, consultants, agents and/or affiliates, harmless from any and all claims, damages, losses, and expenses, including reasonable attorneys' fees, that may be incurred by DTPA or its partners, consultants, agents and/or affiliates, in connection with the Documents. The User and any other party accepting the Documents, shall be deemed to have agreed to the terms and conditions set forth herein and to hold DTPA, its partners, consultants, agents and/or affiliates, harmless from any and all claims, damages, losses, and expenses, including reasonable attorneys' fees, that may be incurred by DTPA or its partners, consultants, agents and/or affiliates, in connection with the Documents.



1 East West Building Section
 A-210 1/8" = 1'-0"

Construction Elevation Legend

- EXISTING MASONRY/STONE WALL CONSTRUCTION
- FACE BRICK TO MATCH COLOR, TEXTURE, AND MORTAR WITH EXISTING
- EXISTING DAMAGED MASONRY & MORTAR JOINTS - POINT LOOSE JOINTS
- EXISTING DAMAGED STONE - PATCH OR REPLACE
- AREAS WITH PAINT & GRAFFITI - TO BE CLEANED
- RESTORATION KEY

Restoration Key Notes

#	RESTORATION NOTES
1	CLEAN EXISTING LIMESTONE OR TERRA COTTA
2	CLEAN EXISTING MASONRY
3	EXIST CRACKED MASONRY - REPAIR, REPOINT
4	BRICK INFILL TO MATCH EXISTING SIZE, COLOR, TEXTURE AND UNIT DIMENSION.

General Restoration Notes

- A. REMOVE GRAFFITI AND PAINT FROM ALL BRICK AND LIME STONE SURFACES.
- B. EXISTING BRICK, LIMESTONE SILLS, TRIMS AND MOULDINGS TO BE CLEANED WITH LOW PRESSURE WATER.
- C. REPAIR ALL CRACKED AND SPALLING MASONRY RESULTING FROM REMOVAL OF EXISTING ATTACHMENTS.
- D. NEW BRICK INSTALLED TO MATCH EXISTING IN SIZE, COLOR, TEXTURE, AND UNIT DIMENSION.
- E. REPAIR LIMESTONE WINDOW TRIM, SILLS WHERE DAMAGED.
- F. NEW ALUMINUM WINDOWS TO RESEMBLE HISTORICAL WOOD FRAMES AND MUNTINS.
- G. NEW EXTERIOR ALUMINUM STOREFRONT DOORS TO RESEMBLE HISTORICAL WOOD DOORS.
- H. INSTALL NEW FIBERGLASS CORNICE TO RESEMBLE PROFILE, COLOR, TEXTURE OF THE ORIGINAL.

PS 186

521 West 145th Street
New York, New York

Boys & Girls Club of Harlem
425 West 144th Street
New York, New York 10001

Alembic Community Development
11 Hanover Square, Suite 701
New York, New York 10001

Monadnock Construction, Inc.
155 3rd Street
Brooklyn, New York 11231

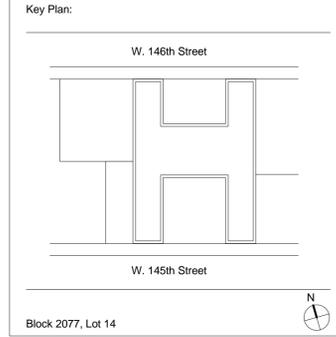
DattnerArchitects 1385 Broadway, 15th Floor
New York, NY 10018
tel 212 247 2660
info@dattner.com

Structural Engineers
De Nardis Engineering, LLC
15 Reservoir Road
White Plains, NY 10603-2516

Mechanical Electrical Plumbing Engineers
Abraham Joselow, P.C.
45 West 34th Street Suite 1101
New York, NY 10001

Revisions:

Issue: DOB Permit Submission



Key Plan
© 2014 Dattner Architects D.P.C.

East West Building Section

Date 02/14/14

Scale 1/8" = 1'-0"

Drawn By IP

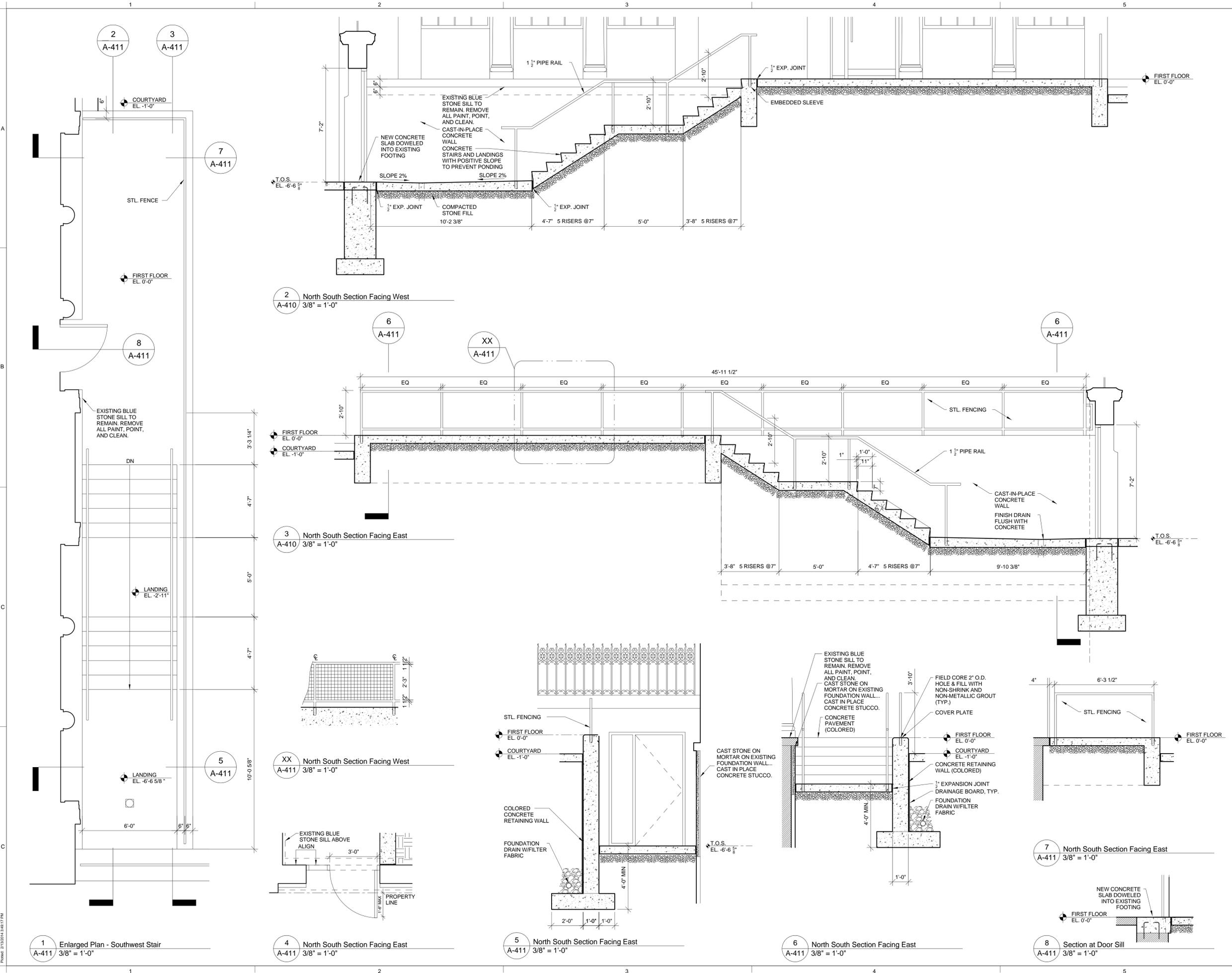
Checked By Checker

Project No. 1214 Seal

Sheet No. **A-210.00**



By access or receipt, the User acknowledges, consents and agrees that the documents, provided by Richard Dattner & Partners Architects (RDP), including but not limited to plans and specifications, in any media the Documents, are copyrighted instruments of professional services. The User grants that the Documents may not be used for any other project or for any use not expressly authorized by RDP. The User further agrees that RDP shall have no responsibility or liability in connection with the execution of the project or the use of the Documents. No representation is made by RDP as to the use of the Documents in any other project or for any use not expressly authorized by RDP. The User shall be responsible for obtaining all necessary permits and approvals for the project. The User shall be responsible for obtaining all necessary permits and approvals for the project. The User shall be responsible for obtaining all necessary permits and approvals for the project.



PS 186
 521 West 145th Street
 New York, New York

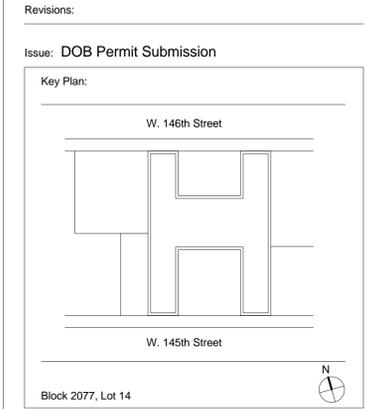
Boys & Girls Club of Harlem
 425 West 144th Street
 New York, New York 10001

Alembic Community Development
 11 Hanover Square, Suite 701
 New York, New York 10001

Monad Construction, Inc.
 155 3rd Street
 Brooklyn, New York 11231

Structural Engineers
De Nardis Engineering, LLC
 15 Reservoir Road
 White Plains, NY 10603-2516

Mechanical Engineers
Abraham Joselow, P.C.
 45 West 34th Street Suite 1101
 New York, NY 10001

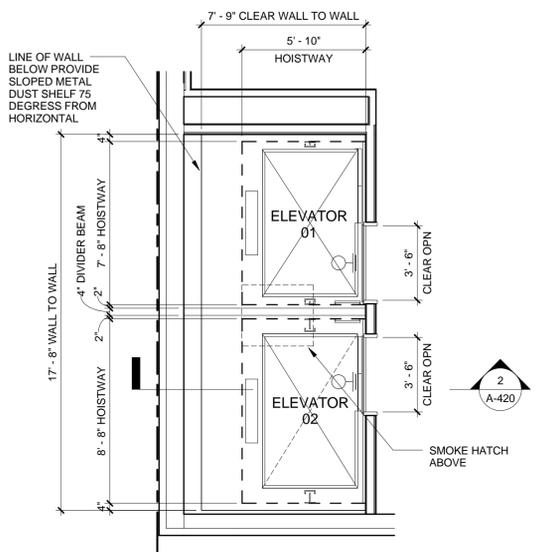


Key Plan
 © 2013 Dattner Architects D.P.C.

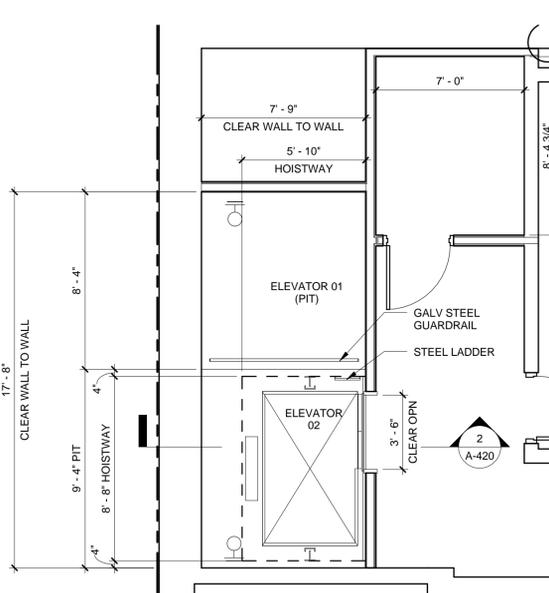
Southwest Stair - Plans and Sections

Date	02/14/14
Scale	As indicated
Drawn By	Author
Checked By	Checker
Project No.	1214 Seal
Sheet No.:	A-411.00

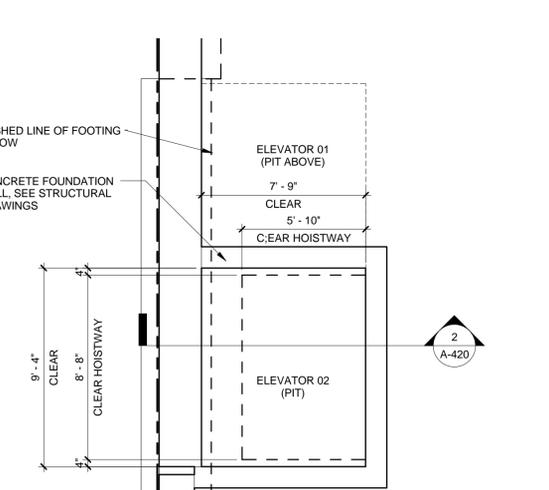
By access or receipt, the User acknowledges, consents and agrees that the documents, including but not limited to plans and specifications, in any media, are the property of the Architect and are to be used only for the project and site for which they are prepared. The User agrees that the documents may not be used for any other project or site without the written consent of the Architect. The Architect shall have no responsibility or liability in connection with the architectural services provided by the Architect. The Architect shall not be responsible for any errors or omissions in the documents, including but not limited to the documents, which may be caused by the User or any other party. The Architect shall not be responsible for any errors or omissions in the documents, including but not limited to the documents, which may be caused by the User or any other party. The Architect shall not be responsible for any errors or omissions in the documents, including but not limited to the documents, which may be caused by the User or any other party.



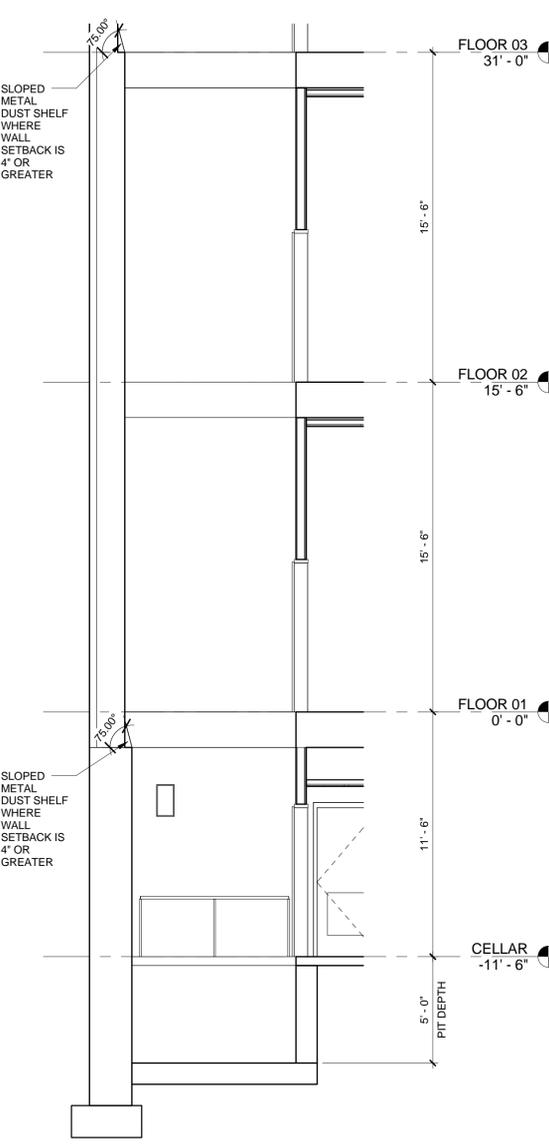
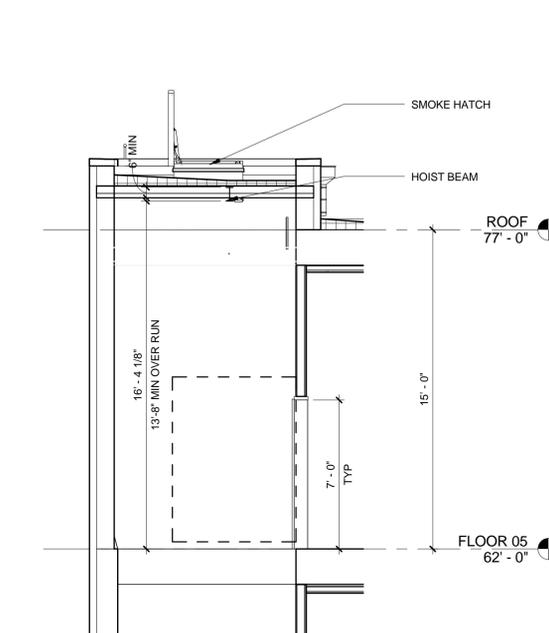
8 Elevator Plan Floor 01 - 05 (Typical)
A-420 1/4" = 1'-0"



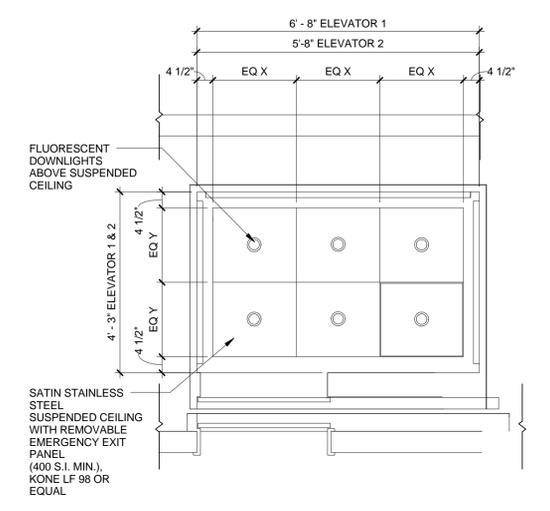
5 Elevator Plan Cellar
A-420 1/4" = 1'-0"



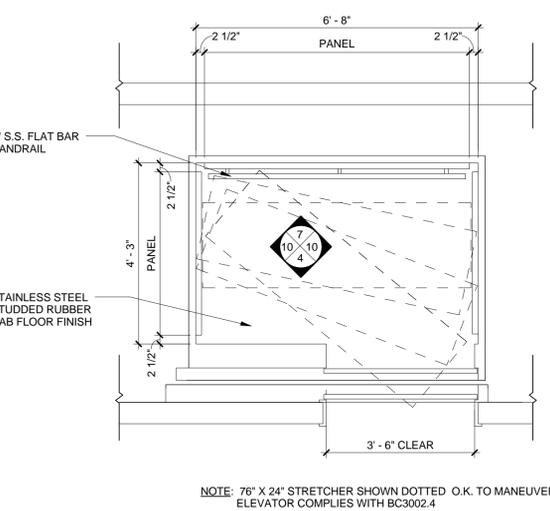
1 Elevator Plan - PIT
A-420 1/4" = 1'-0"



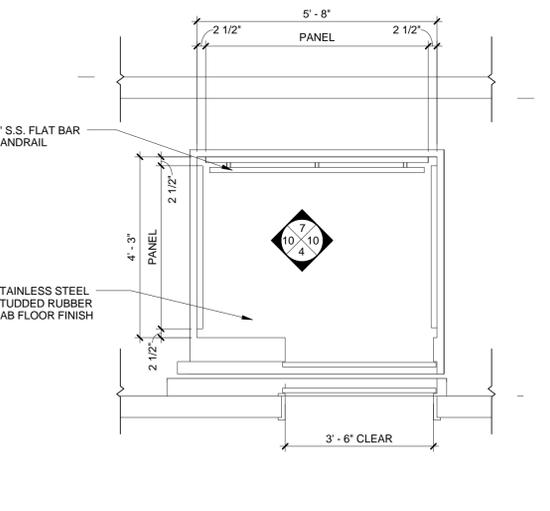
2 Elevator - Shaft Section
A-420 1/4" = 1'-0"



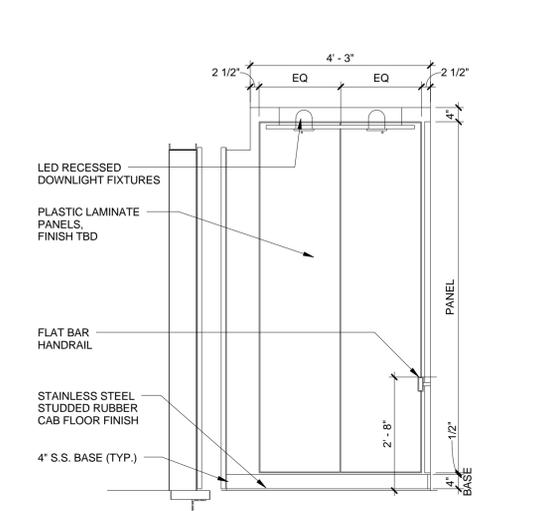
9 Elevator Cab - RCP
A-420 1/2" = 1'-0"



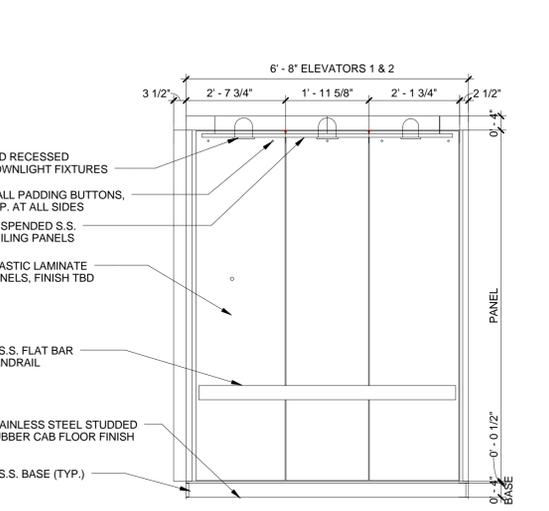
6 Cab Plan Detail - Elevator 02
A-420 1/2" = 1'-0"



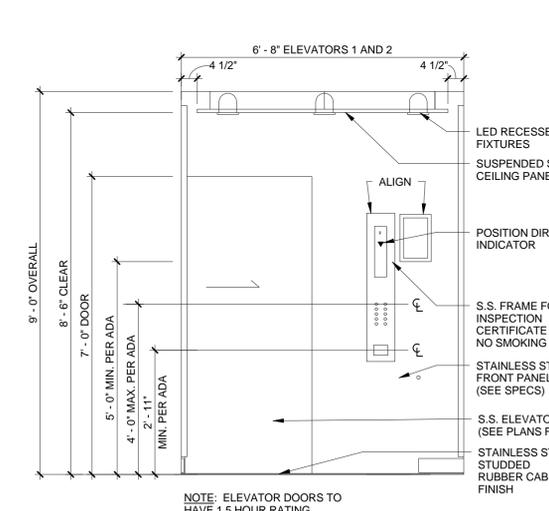
3 Cab Plan Detail - Elevator 01
A-420 1/2" = 1'-0"



10 Elevator Cab - Side
A-420 1/2" = 1'-0"



7 Elevator Cab - Back
A-420 1/2" = 1'-0"



4 Elevator Cab - Front
A-420 1/2" = 1'-0"

PS 186
521 West 145th Street
New York, New York

Boys & Girls Club of Harlem
425 West 144th Street
New York, New York 10001

Alembic Community Development
11 Hanover Square, Suite 701
New York, New York 10001

Monadnock Construction, Inc.
155 3rd Street
Brooklyn, New York 11231

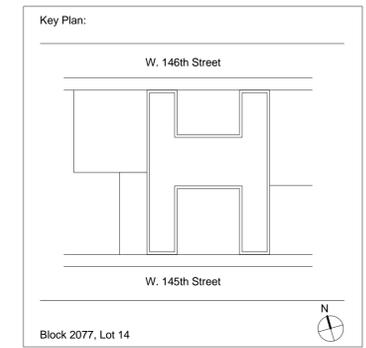
DattnerArchitects 1385 Broadway, 15th Floor
New York, NY 10018
tel 212 247 2660
info@dattner.com

Structural Engineers
De Nardis Engineering, LLC
15 Reservoir Road
White Plains, NY 10603-2516

Mechanical Electrical Plumbing Engineers
Abraham Joselow, P.C.
45 West 34th Street Suite 1101
New York, NY 10001

Revisions:

Issue: DOB Permit Submission



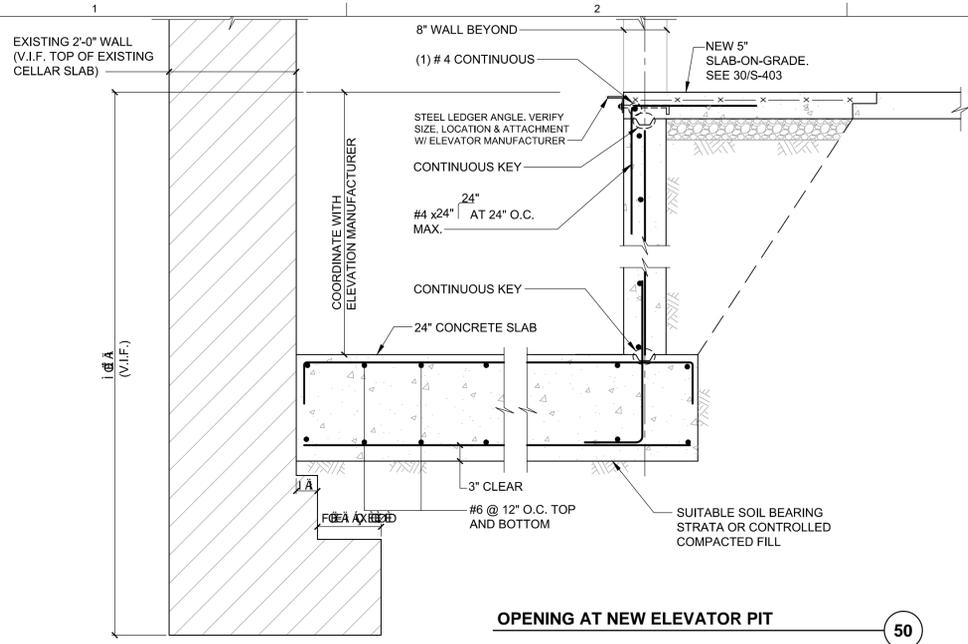
Key Plan
© 2014 Dattner Architects D.P.C.

Elevator Plan, Sections & Cab Interior Elevations

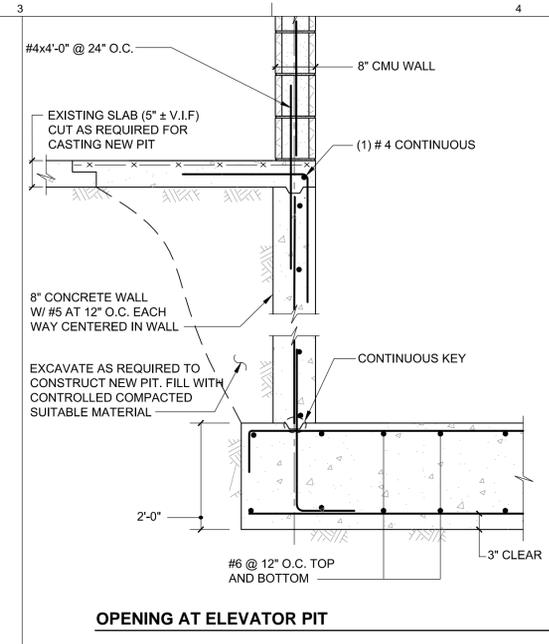
Date: 02/14/14
Scale: As indicated
Drawn By: Author
Checked By: Checker
Project No.: 1214 Seal
Sheet No.:



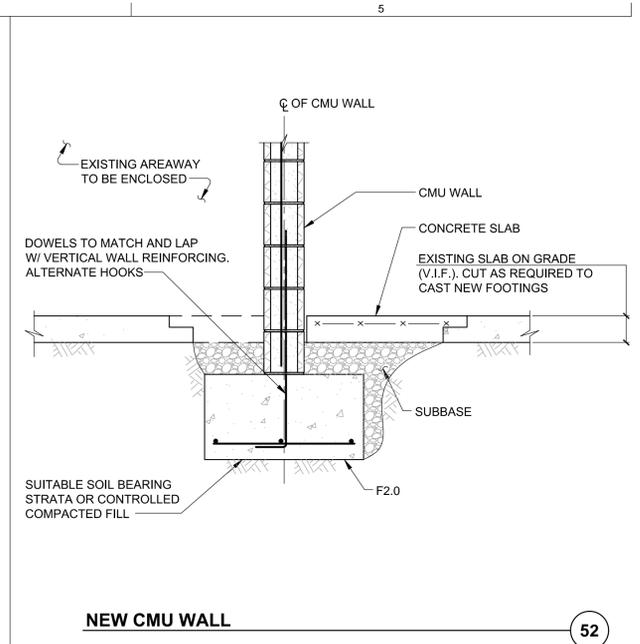
A-420.00



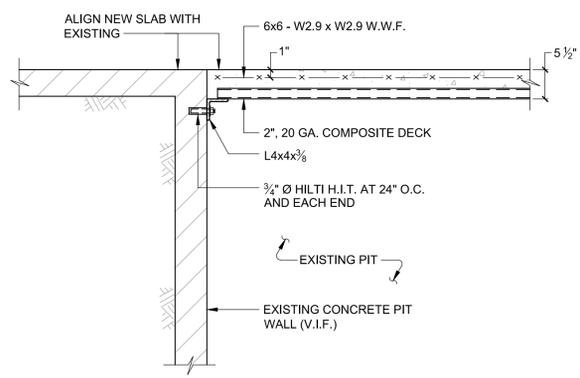
OPENING AT NEW ELEVATOR PIT 50



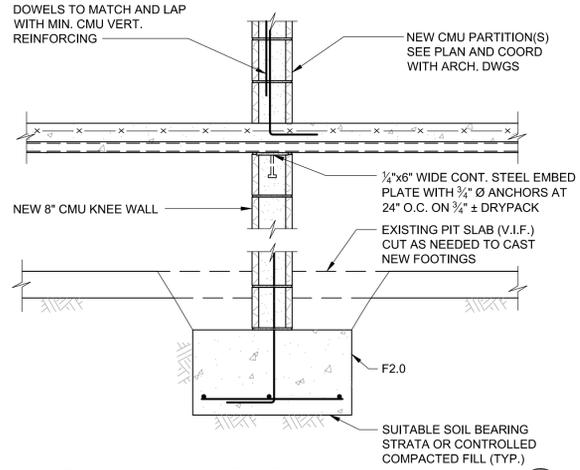
OPENING AT ELEVATOR PIT 51



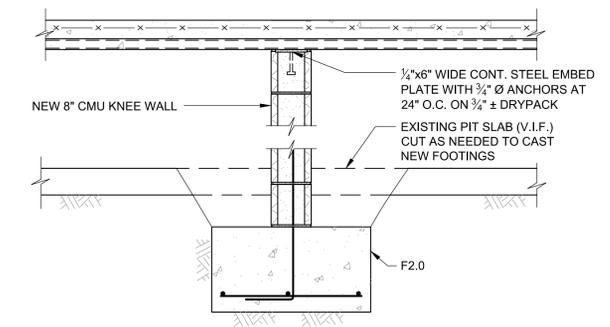
NEW CMU WALL 52



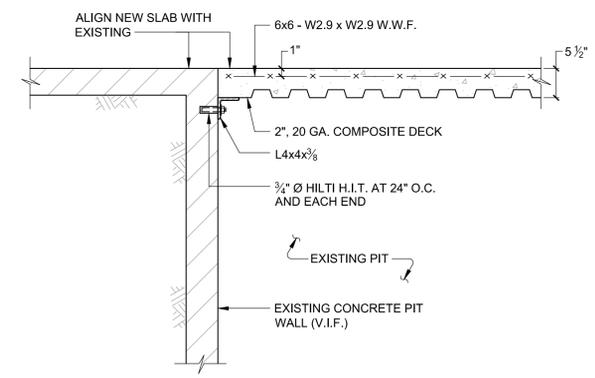
SECTION THROUGH PIT INFILL 54



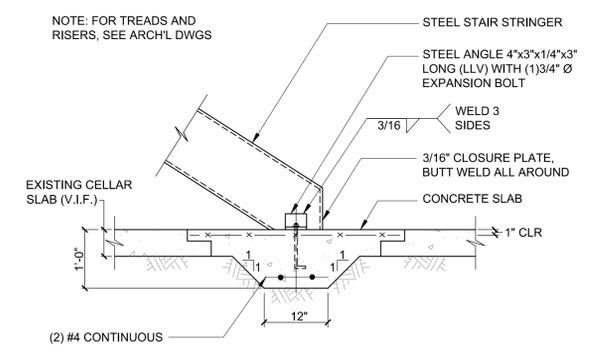
SECTION THROUGH PIT INFILL 55



SECTION THROUGH PIT INFILL 56



SECTION THROUGH PIT INFILL 57



STAIR STRINGER TO SLAB CONNECTION 61

DOB PERMIT SUBMISSION
02/14/2014

PS 186

521 WEST 145TH ST.
NEW YORK, NY

Boys & Girls Club of Harlem
425 West 144th Street
New York, New York 10001

Alembic Community Development
11 Hanover Square, Suite 701
New York, New York 10001

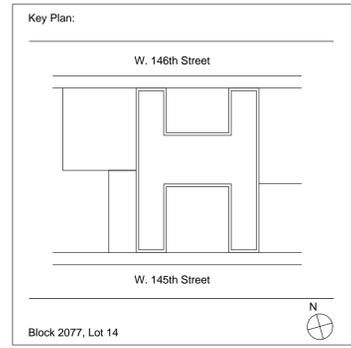
Monadnock Construction, Inc.
155 3rd Street
Brooklyn, New York 11231

DattnerArchitects 1385 Broadway, 15th Floor
New York, NY 10018
tel 212 247 2660
info@dattner.com

Structural Engineers
De Nardis Engineering, LLC
15 Reservoir Road
White Plains, NY 10603-2516

Mechanical Engineers
Abraham Joselow, P.C.
45 West 34th Street Suite 1101
New York, NY 10001

Revisions:
Issue: **DOB PERMIT SUBMISSION**



Block 2077, Lot 14

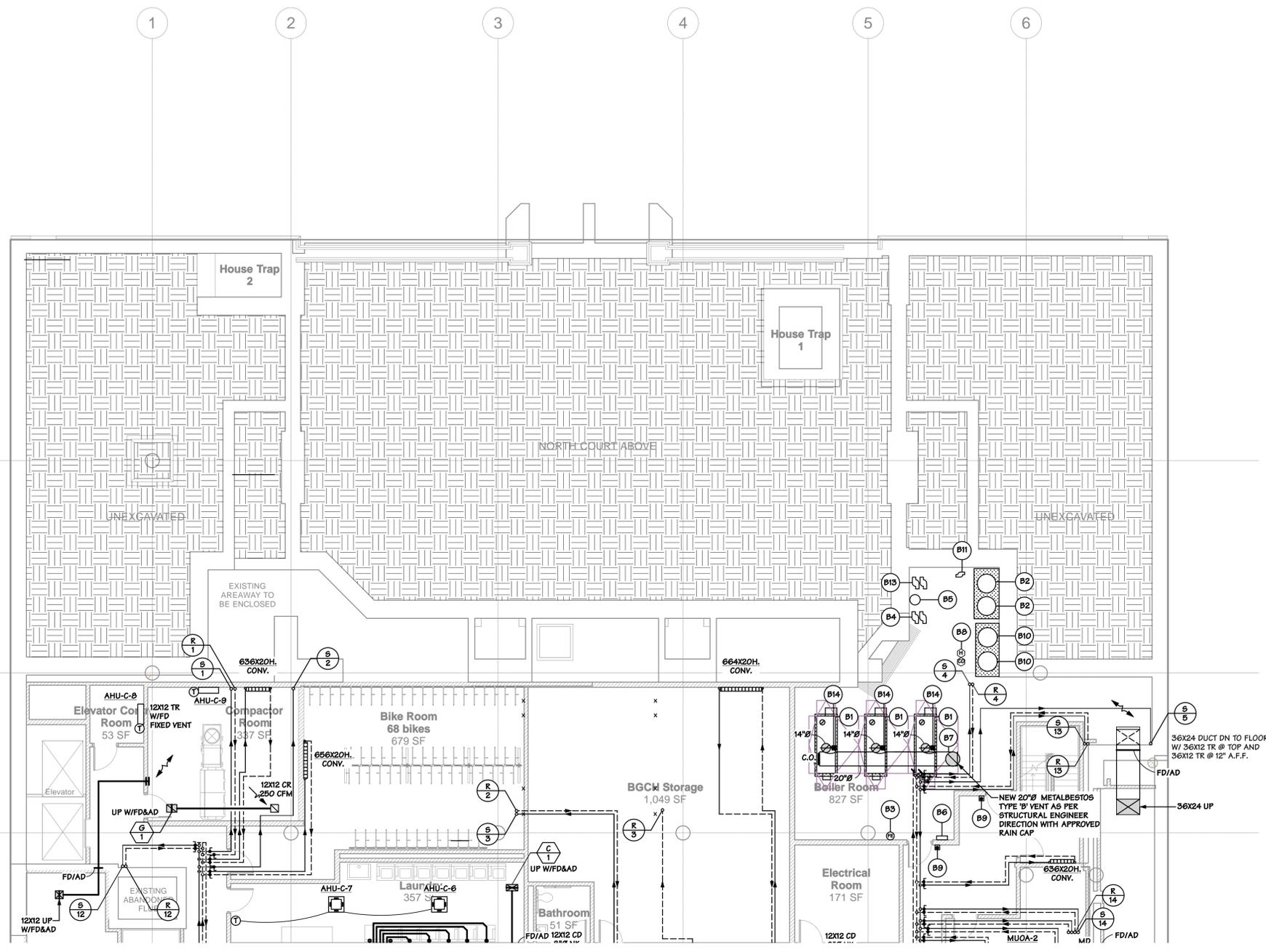
CELLAR/FOUNDATION DETAILS

Title -
Date February 14, 2014
Scale AS NOTED
Drawn By SAB
Checked By JDN
Project No. 12019.00 Seal
Sheet No. **S-500.00**



BOILER ROOM KEY NOTES:

- (B1) H.W. BOILER-HEATING
95% EFFICIENT
(3) LAARS FENNANT #PNCH-1750
1,750,000 BTUH INPUT EACH
1,480,000 BTUH OUTPUT EACH
W/ INTEGRAL 1/2 HP PUMP
WEIGHT: 550 LBS. EACH
DIM: 59.0" X 29.3" X 41.5" H EACH
OPERATING PRESSURE 75 PSI EACH
RELIEF VALVE SET AT 125 PSI EACH
ON 4" CONC. PAD BY G.C.
MEA#136-03-E VOL II
- (B2) (2) TURBOMAX MODEL#T-109
INDIRECT HOT WATER TANKS
ON 4" CONC. PAD
119 GAL. CAPACITY EACH
DIM: 29" DIA. X 72.75" H
555 LBS. SHIP WT.
- (B3) CLASS A FIRE EXTINGUISHER
- (B4) HEATING CIRCULATING PUMPS (ONE SPARE)
ARMSTRONG MODEL#4300 IVS - 4x4x1.5 - 15HP
W/ VFD DRIVES AND PREMIUM EFFICIENCY MOTORS
(SEE SCHEDULE)
- (B5) AIR/DIRT SEPARATOR
CALEFFI MODEL #NA548120A
WITH INSULATION.
(SEE SCHEDULE)
- (B6) CONTROL PANELS
TEKMAR MODEL#274
W/ NIGHT SETBACK AND
OUTDOOR TEMPERATURE
CONTROL RESET
AND (2) TEKMAR #132
PUMP SEQUENCERS
- (B7) NEW 22"Ø TYPE-B GAS VENT
HEAT DETECTOR AND CARBON
MONOXIDE DETECTOR
- (B8) EMERGENCY DISCONNECT SWITCH
FOR BOILERS.
- (B10) EXPANSION TANKS
(2) ARMSTRONG MODEL #AX-280V
21 GALLONS EA. 30" DIA. X 78" H.
WT: 746 LBS
- (B11) HOT WATER RECIRC. PUMP
1/3 HP BRONZE CIRCULATOR
PREMIUM NEMA EFFICIENT MOTOR
- (B12) 60" X 12" COMBUSTION AIR LOUVER
AND BIRDSCREEN W/ FD PLANK OFF
UNUSED PORTIONS AND INSULATE
- (B13) TURBOMAX PUMPS (ONE SPARE)
ARMSTRONG MODEL#4300-4x4x1.5 - 15 HP, PREMIUM
EFFICIENCY MOTORS. (SEE SCHEDULE)
- (B14) BAROMETRIC DAMPER



PS 186

521 West 145th Street
New York, New York

Boys & Girls Club of Harlem
425 West 144th Street
New York, New York 10001

Alembic Community Development
11 Hanover Square, Suite 701
New York, New York 10001

Monadnock Construction, Inc.
155 3rd Street
Brooklyn, New York 11231

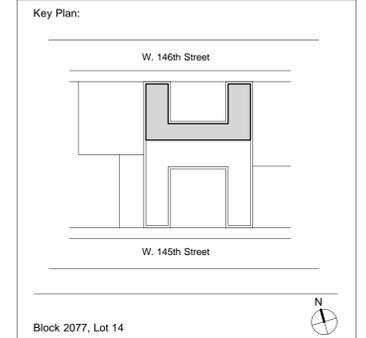
DattnerArchitects 1385 Broadway, 15th Floor
New York, NY 10018
tel 212 247 2660
info@dattner.com

Structural Engineers
De Nardis Engineering, LLC
15 Reservoir Road
White Plains, NY 10603-2516

Mechanical Engineers
Abraham Joselow, P.C.
45 West 34th Street Suite 1101
New York, NY 10001

Revisions:

Issue: DOB Permit Submission



Key Plan
© 2014 Dattner Architects D.P.C.

Plan Cellar Floor - North

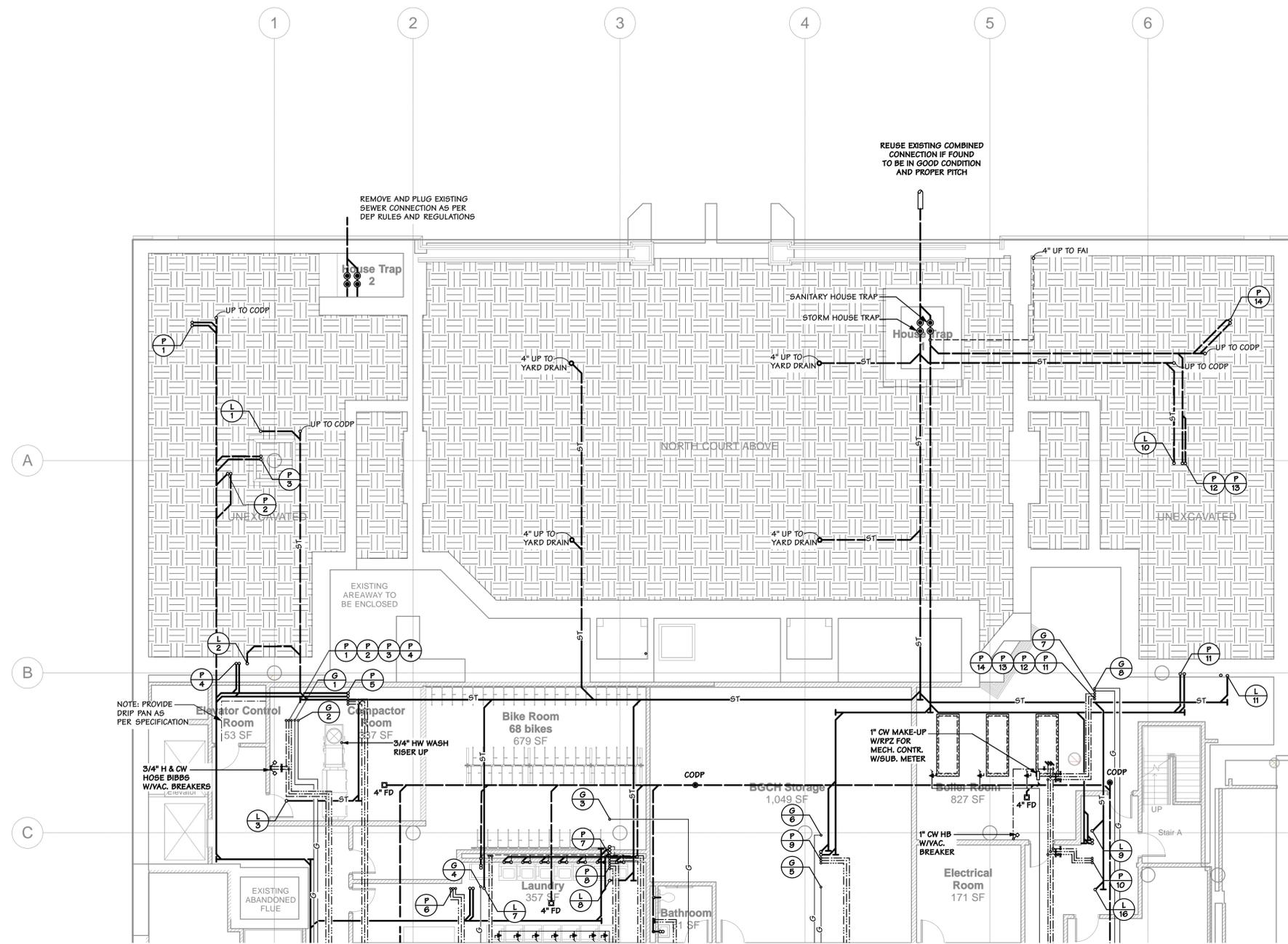
Date 02/14/14
Scale 1/8" = 1'-0"
Drawn By YL/PJ
Checked By PJ

Project No. 1214 Seal
Sheet No. M-100.00

THIS PLAN IS APPROVED ONLY FOR WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

Project: 07/2009 11:35:38 AM
 This plan is approved only for work indicated on the application specification sheet. All other matters shown are not to be relied upon or to be considered as either being approved or in accordance with applicable codes.

The undersigned hereby certifies that the drawings, specifications, and other documents herein were prepared by the undersigned or under the direct supervision and control of the undersigned, who is a duly licensed Professional Engineer in the State of New York. The undersigned hereby certifies that the drawings, specifications, and other documents herein were prepared by the undersigned or under the direct supervision and control of the undersigned, who is a duly licensed Professional Engineer in the State of New York. The undersigned hereby certifies that the drawings, specifications, and other documents herein were prepared by the undersigned or under the direct supervision and control of the undersigned, who is a duly licensed Professional Engineer in the State of New York.



PS 186

521 West 145th Street
New York, New York

Boys & Girls Club of Harlem
425 West 144th Street
New York, New York 10001

Alembic Community Development
11 Hanover Square, Suite 701
New York, New York 10001

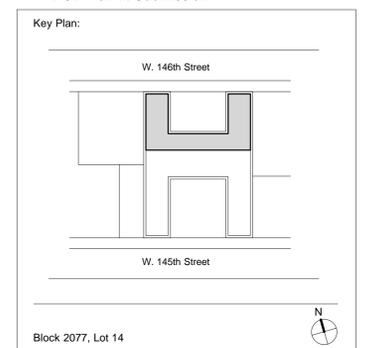
Monadnock Construction, Inc.
155 3rd Street
Brooklyn, New York 11231

DattnerArchitects 1385 Broadway, 15th Floor
New York, NY 10018
tel 212 247 2660
info@dattner.com

Structural Engineers
De Nardis Engineering, LLC
15 Reservoir Road
White Plains, NY 10603-2516

Mechanical Engineers
Abraham Joselow, P.C.
45 West 34th Street Suite 1101
New York, NY 10001

Revisions:
Issue: DOB Permit Submission



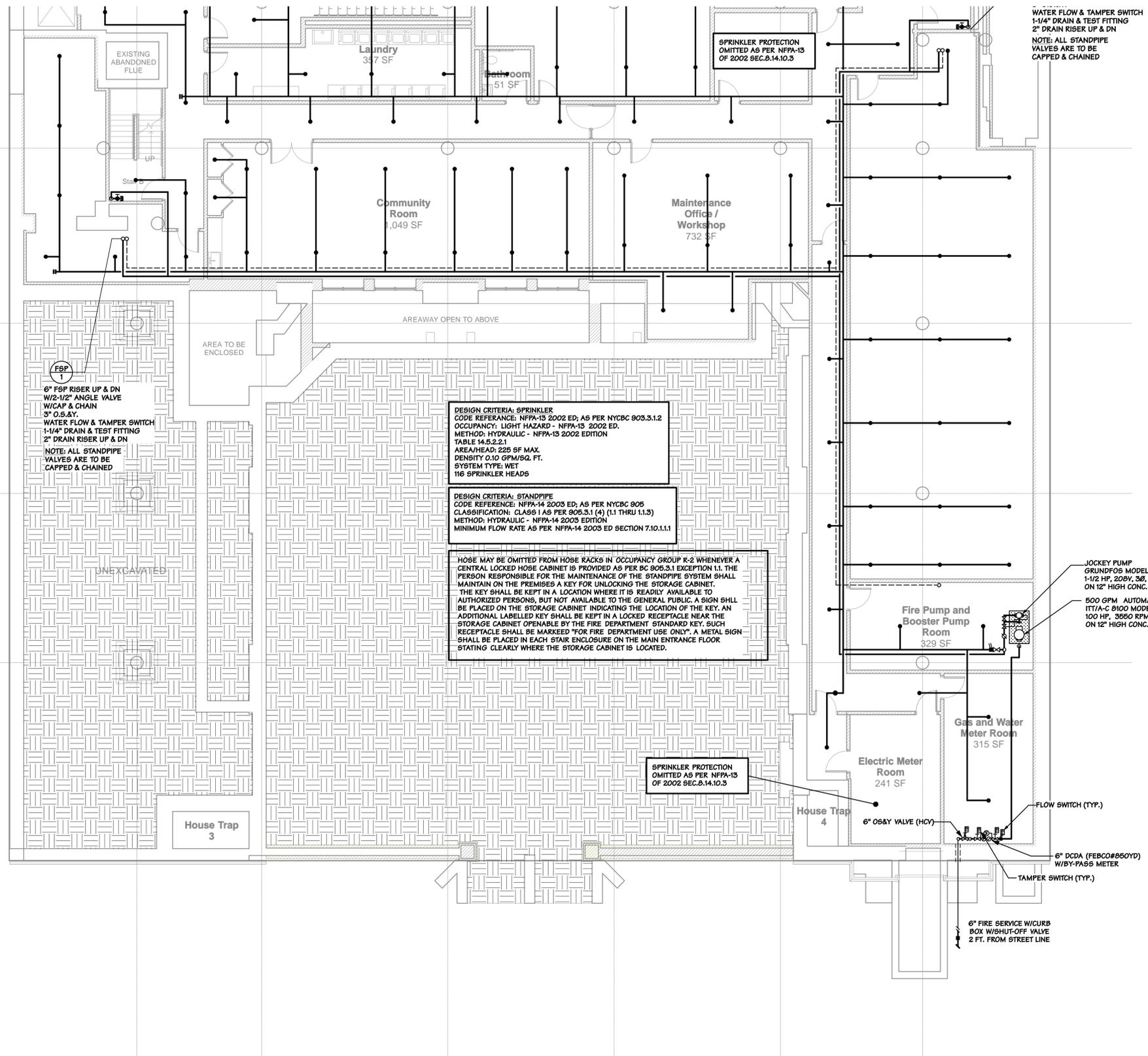
Key Plan
© 2014 Dattner Architects D.P.C.

Plan Cellar Floor - North

Date	02/14/14
Scale	1/8" = 1'-0"
Drawn By	YL/PJ
Checked By	PJ
Project No.	1214 Seal
Sheet No.:	P-100.00

THIS PLAN IS APPROVED ONLY FOR WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

This document is the property of Dattner Architects, P.C. and is to be used only for the project and location specified. It is not to be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written permission of Dattner Architects, P.C. The user of this document is responsible for verifying the accuracy of the information contained herein. The user of this document is also responsible for obtaining all necessary permits and approvals from the appropriate authorities. The user of this document is also responsible for obtaining all necessary approvals from the appropriate authorities. The user of this document is also responsible for obtaining all necessary approvals from the appropriate authorities.



6" FSP RISER UP & DN
W/2-1/2" ANGLE VALVE
W/CAP & CHAIN
3" O.S.&Y.
WATER FLOW & TAMPER SWITCH
1-1/4" DRAIN & TEST FITTING
2" DRAIN RISER UP & DN
NOTE: ALL STANDPIPE VALVES ARE TO BE CAPPED & CHAINED

DESIGN CRITERIA: SPRINKLER
CODE REFERENCE: NFPA-13 2002 ED; AS PER NYCBC 903.3.1.2
OCCUPANCY: LIGHT HAZARD - NFPA-13 2002 ED.
METHOD: HYDRAULIC - NFPA-13 2002 EDITION
TABLE 14.5.2.2.1
AREA/HEAD: 225 SF MAX.
DENSITY 0.10 GPM/SQ. FT.
SYSTEM TYPE: WET
116 SPRINKLER HEADS

DESIGN CRITERIA: STANDPIPE
CODE REFERENCE: NFPA-14 2003 ED; AS PER NYCBC 905
CLASSIFICATION: CLASS I AS PER 905.3.1 (4) (1) THRU 1.1.3)
METHOD: HYDRAULIC - NFPA-14 2003 EDITION
MINIMUM FLOW RATE AS PER NFPA-14 2003 ED SECTION 7.10.1.1.1

HOSE MAY BE OMITTED FROM HOSE RACKS IN OCCUPANCY GROUP R-2 WHENEVER A CENTRAL LOCKED HOSE CABINET IS PROVIDED AS PER 905.3.1 EXCEPTION 1). THE PERSON RESPONSIBLE FOR THE MAINTENANCE OF THE STANDPIPE SYSTEM SHALL MAINTAIN ON THE PREMISES A KEY FOR UNLOCKING THE STORAGE CABINET. THE KEY SHALL BE KEPT IN A LOCATION WHERE IT IS READILY AVAILABLE TO AUTHORIZED PERSONS, BUT NOT AVAILABLE TO THE GENERAL PUBLIC. A SIGN SHALL BE PLACED ON THE STORAGE CABINET INDICATING THE LOCATION OF THE KEY. AN ADDITIONAL LABELED KEY SHALL BE KEPT IN A LOCKED RECEPTACLE NEAR THE STORAGE CABINET OPENABLE BY THE FIRE DEPARTMENT STANDARD KEY. SUCH RECEPTACLE SHALL BE MARKED "FOR FIRE DEPARTMENT USE ONLY". A METAL SIGN SHALL BE PLACED IN EACH STAIR ENCLOSURE ON THE MAIN ENTRANCE FLOOR STATING CLEARLY WHERE THE STORAGE CABINET IS LOCATED.

SPRINKLER PROTECTION OMITTED AS PER NFPA-13 OF 2002 SEC.8.14.10.3

WATER FLOW & TAMPER SWITCH
1-1/4" DRAIN & TEST FITTING
2" DRAIN RISER UP & DN
NOTE: ALL STANDPIPE VALVES ARE TO BE CAPPED & CHAINED

JOCKEY PUMP
GRUNDFOS MODEL CR1-13
1-1/2 HP, 208V, 3Ø, 50HZ
ON 12" HIGH CONC. CURB
500 GPM AUTOMATIC FIRE PUMP @ 75 PSI
ITT/A-C 2100 MODEL 8X63SF UL/F-M LISTED
100 HP, 3550 RPM, 208V, 3Ø, 60 HZ
ON 12" HIGH CONC. CURB

FLOW SWITCH (TYP.)

6" DCDA (FEBCO#B50YD) W/BY-PASS METER
TAMPER SWITCH (TYP.)

6" FIRE SERVICE W/CURB BOX W/SHUT-OFF VALVE 2 FT. FROM STREET LINE

PS 186

521 West 145th Street
New York, New York

Boys & Girls Club of Harlem
425 West 144th Street
New York, New York 10001

Alembic Community Development
11 Hanover Square, Suite 701
New York, New York 10001

Monadnock Construction, Inc.
155 3rd Street
Brooklyn, New York 11231

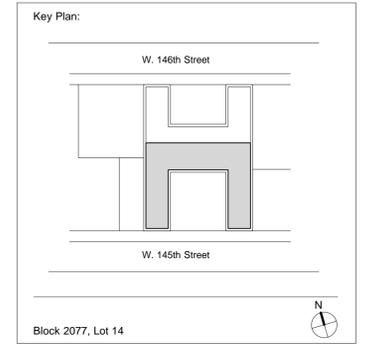
DattnerArchitects 1385 Broadway, 15th Floor
New York, NY 10018
tel 212 247 2660
info@dattner.com

Structural Engineers
De Nardis Engineering, LLC
15 Reservoir Road
White Plains, NY 10603-2516

Mechanical Engineers
Abraham Joselow, P.C.
45 West 34th Street Suite 1101
New York, NY 10001

Revisions:

Issue: DOB Permit Submission



Block 2077, Lot 14

© 2014 Dattner Architects D.P.C.
Plan Cellar Floor - South

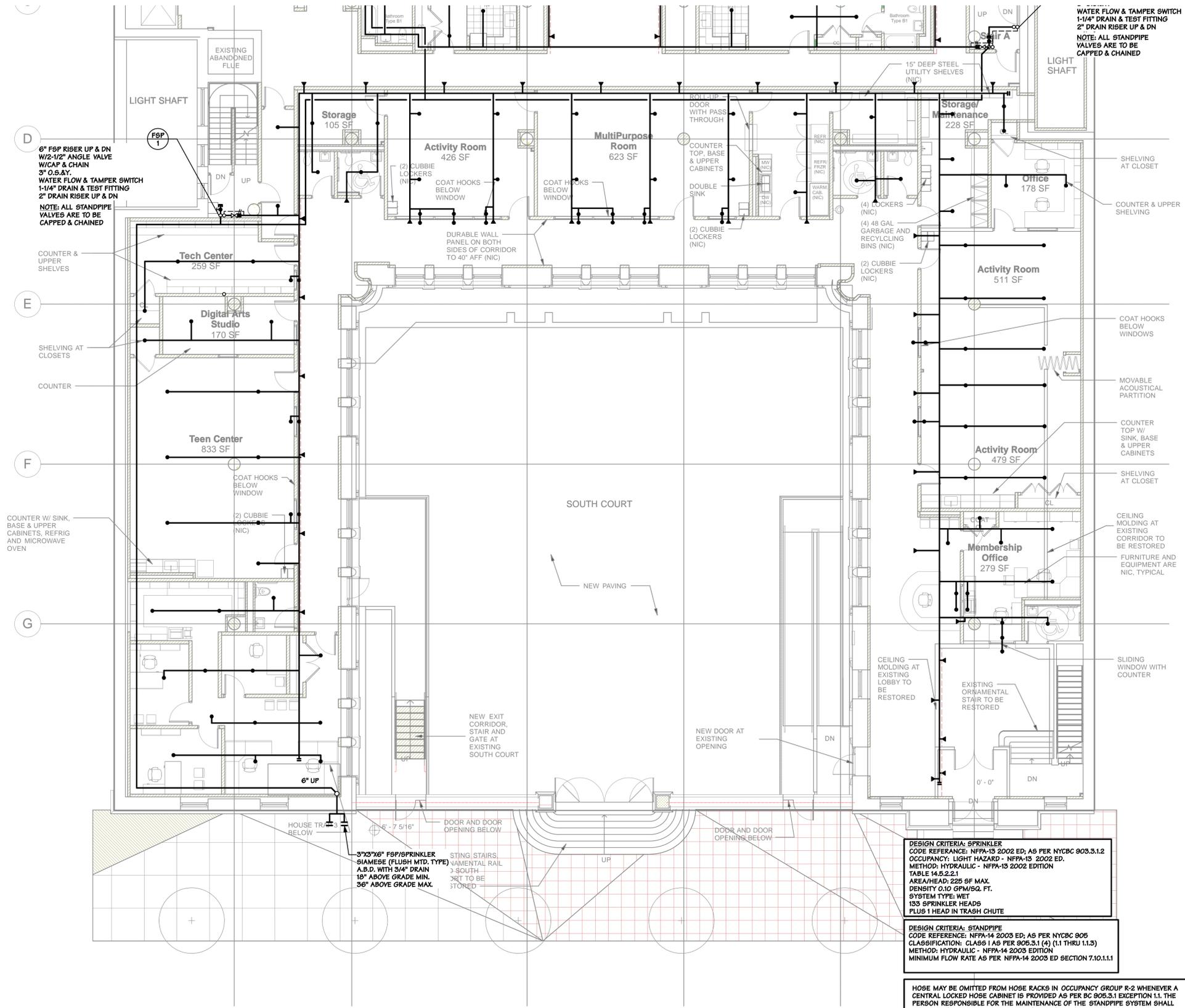
Date 02/14/14
Scale 1/8" = 1'-0"
Drawn By YL/PJ
Checked By PJ

Project No. 1214 Seal

Sheet No.: **SP-101.00**

THIS PLAN IS APPROVED ONLY FOR WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

By access or receipt of the user acknowledges, comments and agrees that the documents, provided by Richard Dattner & Partners Architects DPC (RD&P), including but not limited to plans and specifications, are the property of RD&P. This user further agrees that RD&P shall have no responsibility or liability in connection with the unauthorized use, reproduction, distribution, or disclosure of the documents, in whole or in part, for any purpose other than that intended by RD&P. The user shall indemnify, defend and hold RD&P harmless from and against any and all claims, damages, losses, costs and expenses, including attorney's fees and reasonable attorneys' fees, arising out of or from the use, reproduction, distribution, or disclosure of the documents, in whole or in part, for any purpose other than that intended by RD&P. The user shall also indemnify, defend and hold RD&P harmless from and against any and all claims, damages, losses, costs and expenses, including attorney's fees and reasonable attorneys' fees, arising out of or from the use, reproduction, distribution, or disclosure of the documents, in whole or in part, for any purpose other than that intended by RD&P.



6" F&P RISER UP & DN
W/2-1/2" ANGLE VALVE
W/CAP & CHAIN
3" O.S.&V.
WATER FLOW & TAMPER SWITCH
1-1/4" DRAIN & TEST FITTING
2" DRAIN RISER UP & DN
NOTE: ALL STANDPIPE
VALVES ARE TO BE
CAPPED & CHAINED

WATER FLOW & TAMPER SWITCH
1-1/4" DRAIN & TEST FITTING
2" DRAIN RISER UP & DN
NOTE: ALL STANDPIPE
VALVES ARE TO BE
CAPPED & CHAINED

DESIGN CRITERIA: SPRINKLER
CODE REFERENCE: NFPA-13 2002 ED; AS PER NYCBC 905.3.1.2
OCCUPANCY: LIGHT HAZARD - NFPA-13 2002 ED.
METHOD: HYDRAULIC - NFPA-13 2002 EDITION
TABLE 14-5.2.2.1
AREA/HEAD: 225 SF MAX.
DENSITY 0.10 GPM/SQ. FT.
SYSTEM TYPE: WET
155 SPRINKLER HEADS
PLUS 1 HEAD IN TRASH CHUTE

DESIGN CRITERIA: STANDPIPE
CODE REFERENCE: NFPA-14 2003 ED; AS PER NYCBC 905
CLASSIFICATION: CLASS 1 AS PER 905.3.1 (4) (1) THRU 1.1.3)
METHOD: HYDRAULIC - NFPA-14 2003 EDITION
MINIMUM FLOW RATE AS PER NFPA-14 2003 ED SECTION 7.10.1.1.1

HOSE MAY BE OMITTED FROM HOSE RACKS IN OCCUPANCY GROUP R-2 WHENEVER A
CENTRAL LOCKED HOSE CABINET IS PROVIDED AS PER BC 905.3.1 EXCEPTION 1.1. THE
PERSON RESPONSIBLE FOR THE MAINTENANCE OF THE STANDPIPE SYSTEM SHALL
MAINTAIN ON THE PREMISES A KEY FOR UNLOCKING THE STORAGE CABINET.
THE KEY SHALL BE KEPT IN A LOCATION WHERE IT IS READILY AVAILABLE TO
AUTHORIZED PERSONS, BUT NOT AVAILABLE TO THE GENERAL PUBLIC. A SIGN SHALL
BE PLACED ON THE STORAGE CABINET INDICATING THE LOCATION OF THE KEY. AN
ADDITIONAL LABELLED KEY SHALL BE KEPT IN A LOCKED RECEPTACLE NEAR THE
STORAGE CABINET OPENABLE BY THE FIRE DEPARTMENT STANDARD KEY. SUCH
RECEPTACLE SHALL BE MARKED "FOR FIRE DEPARTMENT USE ONLY". A METAL SIGN
SHALL BE PLACED IN EACH STAIR ENCLOSURE ON THE MAIN ENTRANCE FLOOR
STATING CLEARLY WHERE THE STORAGE CABINET IS LOCATED.

THIS PLAN IS APPROVED ONLY FOR WORK INDICATED ON THE APPLICATION
SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED
UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE
WITH APPLICABLE CODES.

PS 186

521 West 145th Street
New York, New York

Boys & Girls Club of Harlem
 425 West 144th Street
 New York, New York 10001

Alembic Community Development
 11 Hanover Square, Suite 701
 New York, New York 10001

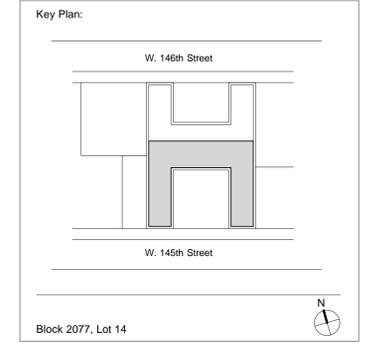
Monadnock Construction, Inc.
 155 3rd Street
 Brooklyn, New York 11231

DattnerArchitects 1385 Broadway, 15th Floor
 New York, NY 10018
 tel 212 247 2660
 info@dattner.com

Structural Engineers
De Nardis Engineering, LLC
 15 Reservoir Road
 White Plains, NY 10603-2516

Mechanical Engineers
Abraham Joselow, P.C.
 45 West 34th Street Suite 1101
 New York, NY 10001

Revisions:
 Issue: **DOB Permit Submission**



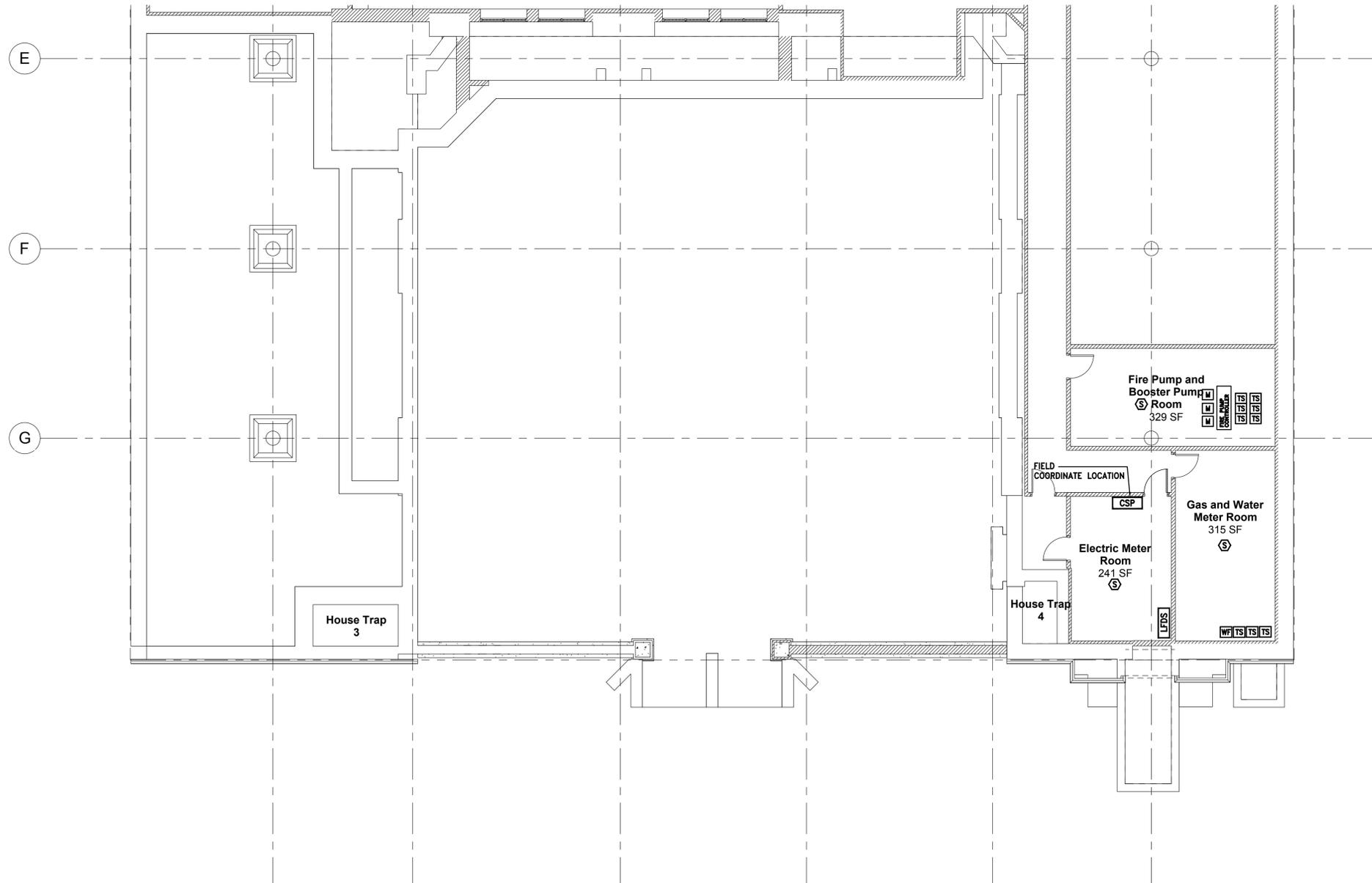
Key Plan
 © 2014 Dattner Architects D.P.C.

Plan First Floor - South

Date 02/14/14
 Scale 1/8" = 1'-0"
 Drawn By YL/PJ
 Checked By PJ
 Project No. 1214 Seal
 Sheet No.

SP-103.00

1/15/14 4:09 PM: as of model, the user acknowledges, consents and agrees that the documents, provided by Richard DeWitt & Partners Architects (RD&P), including but not limited to drawings and specifications, in any media (the "Documents"), are copyrighted instruments of professional services. The user agrees that the Documents may not be used for any other project or for any use not expressly authorized in writing by RD&P. The user further agrees that RD&P shall have no responsibility or liability in connection with the unauthorized use, reuse, change or modification of the Documents in any manner by the user or any other party accessing the Documents. No representation is made by RD&P as to the accuracy or reliability of the Documents or any other party accessing the Documents. Use of the Documents is at the sole risk of the user or any other party accessing the Documents. The user and any other party accessing the Documents shall, to the fullest extent permitted by law, defend, indemnify and hold harmless RD&P, its principals, consultants, agents and/or service or any electronic media be deemed a sale by RD&P, and RD&P makes no warranty, either express or implied, as to their merchantability and fitness for any particular purpose. Project: 8/7/2009 11:35:39 AM



1 Cellar Plan South
 1/8" = 1'-0"

PS 186

521 West 145th Street
 New York, New York

Boys & Girls Club of Harlem
 425 West 144th Street
 New York, New York 10001

Alembic Community Development
 11 Hanover Square, Suite 701
 New York, New York 10001

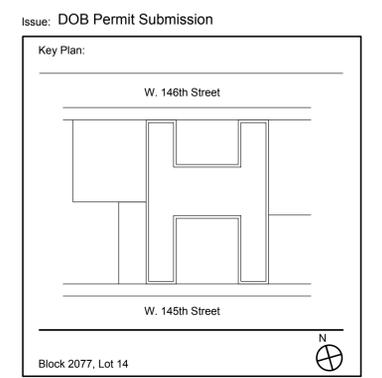
Monadnock Construction, Inc.
 155 3rd Street
 Brooklyn, New York 11231

DattnerArchitects 1385 Broadway, 15th Floor
 New York, NY 10018
 tel 212 247 2660
 info@dattner.com

Structural Engineers
De Nardis Engineering, LLC
 15 Reservoir Road
 White Plains, NY 10603-2516

Mechanical Engineers
Abraham Joselow, P.C.
 45 West 34th Street Suite 1101
 New York, NY 10001

Revisions:



Key Plan
 © 2013 Dattner Architects D.P.C.

Cellar Plan South

Smoke Detection/Sprinkler Alarm

Date	02/14/14
Scale	1/8" = 1'-0"
Drawn By	N.P.
Checked By	D.P.
Project No.	1214 Seal
Sheet No.:	FA101.00

