77 CLAY STREET

BROOKLYN, NEW YORK

Remedial Action Work Plan

NYC VCP Number: 15CVCP094K
E-Designation Site Number: 15EHAZ181K

Prepared for:

Superb Apartments LLC
200 Broadway
Brooklyn, New York 11211

Prepared by:

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS

1808 Middle Country Road
Ridge, NY 11961

MARCH 2015

REMEDIAL ACTION WORK PLAN
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ATTACHMENTS

LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
BOA	Brownfield Opportunity Area
CAMP	Community Air Monitoring Plan
COC	Certificate of Completion
CSOP	Contractors Site Operation Plan
ECs/ICs	Engineering and Institutional Controls
HASP	Health and Safety Plan
VCA	Voluntary Cleanup Agreement
NOC	Notice of Completion
NYC VCP	New York City Voluntary 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 DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
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, Ariel Czemerinski, 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 Site located at 77 Clay Street, Brooklyn, NY, Site number 15HAZ181K and NYC VCP number 15CVCP094K.

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.

_____

Name

_____

NYS PE License Number

_____

Signature

_____

Date

PE Stamp

EXECUTIVE SUMMARY

Superb Apartments LLC has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a 2,500-ft^2 Site located at 77 Clay Street in the Greenpoint section of Brooklyn, 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 at 77 Clay Street in the Greenpoint section of Brooklyn, New York, and is currently identified as Block 2483, Lot 62 on the New York City Tax Map. Figure 1 shows the Site location. Lot 62 is a rectangular shaped lot that includes of 25 feet of street frontage on Clay Street and extends100 feet deep for a total area of 2,500 sf. The Site is located on the north side of Clay Street, between Manhattan Avenue and McGuinness Boulevard. The Site is bordered by mixed-use buildings to the west; an undeveloped lot to the east; parking to the north; and Clay Street to the south. A map of the site boundary is shown on Figure 2.

The Site is improved with one three-story residential building with a full basement and rear yard. The building is currently vacant.

Summary of Proposed Redevelopment Plan

The proposed future use of the Site will consist of developing the lot with a new 4-story apartment building with a full cellar level. The cellar level will cover 65% of the lot, leaving a 875ft^2 rear courtyard. The cellar level will consist of a mechanical room, two open cellar areas (not to be used for living or sleeping rooms), a tenant laundry room, two bathrooms, and three stairwells. Floors 1 through 4 will consist of residential apartments and tenant corridors. The cellar will require the excavation to a depth of approximately 10 feet below grade with additional excavation of approximately 1 ft for the rear at-grade courtyard. Therefore, an estimated 633

cubic yards (950 tons) of soil will require excavation for the new building's cellar. The first floor will contain two residential units, a tenant corridor and stairwell.

Layout of the redevelopment plans for the cellar and first floors are presented in Figure 3. The current zoning designation is M1-2 / R6A. The proposed use is consistent with existing zoning for the property.

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

Summary of Environmental Findings

1. The elevation of the Site is approximately 12 feet.
2. Depth to groundwater is estimated to be approximately 9 feet below sidewalk grade.
3. Groundwater flow is generally east/northeast.
4. Depth to bedrock is at the Site is greater than 100 feet.
5. The stratigraphy of the Site consists of historic fill material to depths as great as 4 feet, underlain by native brown silty sand.
6. Soil/fill samples results were compared to NYSDEC Unrestricted Use Soil Cleanup Objectives (Track 1) and Restricted Residential Use Soil Cleanup Objectives (Track 2) as presented in 6NYCRR Part 375-6.8 and CP51. Soil/fill samples detected no PCBs in any of the shallow or deep soil samples. VOCs were detected in both shallow and deep soil samples, but at concentrations below Unrestricted Use SCOs and Restricted Residential Use SCOs. SVOCs were detected in shallow soils, including benz(a)anthracene (4,500 µg/kg), benzo(a)pyrene (3,700 µg/kg), benzo(b)fluoranthene (4,600 µg/kg), chrysene (4,800 µg/kg), dibenzo(a)anthracene (650 µg/kg), and indeno(1,2,3-cd)pyrene (2,400 µg/kg) were detected above Restricted Residential Use SCOs in one shallow soil sample (B-1). Several metals including arsenic (22.6 mg/kg), barium (386 mg/kg), cadmium (2.64 mg/kg), chromium (max. of 101 µg/kg), copper (max. of 157 µg/kg), lead (916 mg/kg) mercury (2.33 mg/kg) and zinc (max. of 783 µg/kg) were detected above Unrestricted Use SCOs; and of these arsenic, barium, cadmium, lead and mercury also

exceeded Restricted residential use SCOs. All shallow metal exceedances were detected in one shallow soil boring (B-1). One metal, chromium (101 µg/kg) was detected in one deeper soil sample above Unrestricted Use SCO. Pesticides including 4,4-DDE (490 µg/kg); 4,4-DDT (20 µg/kg); 4,4-DDD (14 µg/kg) and dieldrin (27 µg/kg) were detected above Unrestricted Use SCOs in two shallow soils sample. Overall, the soil results were consistent with data identified at sites with historic fill material in NYC with the exception of boring B-1, which was elevated for metals and SVOCs. Boring B-1 is located in proposed rear yard area.

7. Groundwater samples results were compared to New York State 6NYCRR Part 703.5 Class GA groundwater quality standards (GQS). Groundwater samples showed no Pesticides or PCBs at detectable concentrations. One VOC, acetone, was detected above GQS in both groundwater samples. Several SVOCs were detected above GQS, including benzo(a)anthracene (max. of 0.08 µg/L), benzo(a)pyrene (0.06 µg/L), benzo(b)fluoranthene (0.08 µg/L), benzo(k)fluoranthene (0.04 µg/L), chrysene (0.07 µg/L), and indeo(1,2,3-cd)pyrene (0.03 µg/L). Several metals were identified, but only magnesium (35.2 mg/L), manganese (max of 0.862 mg/L) and sodium (32.8 mg/L) exceeded their respective GQS in groundwater samples.

   Soil vapor results collected during the RI were compared to the compounds listed in Vapor Intrusion Matrices in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion, dated October 2006. Total concentrations of petroleum-related VOCs (BTEX) ranged from 25.17 µg/m^3 to 82.99 µg/m^3. The CVOC trichloroethylene (TCE) was not detected in any of the soil gas samples. Tetrachloroethylene (PCE) was detected in all three soil gas samples ranging in concentration from 0.271 µg/m^3 to 0.678 µg/m^3. Carbon tetrachloride was detected in one soil gas sample at a concentration of 0.629 µg/m^3. 1,1,1-trichloroethane was not detected in any of the three soil gas samples. The PCE concentrations are below the monitoring level ranges established within the State NYSDOH soil vapor guidance matrix.

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. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility. A Waste Characterization Report documenting sample procedures, location, analytical results shall be submitted to NYCOER prior to start of remedial action.
4. Establishment of Site-Specific (Track 4) Soil Cleanup Objectives (SCOs).
5. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
6. Excavation and removal of soil/fill exceeding Track 4 Site-Specific SCOs. For development purposes, the front 65 feet of the 100 ft long Site will require excavation to a depth of approximately 10 feet below grade for the building cellar level with additional excavation of approximately 1 ft for the rear at-grade courtyard. Additional excavation will be required in the rear courtyard area to remove a metal and SVOCs hotspot to achieve Track 4 Site-Specific SCOs. Approximately 950 tons of soil will be removed.
7. 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.
8. Management of excavated materials including temporarily stockpiling and segregating to prevent co-mingling of contaminated material and non-contaminated materials.

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9. 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.
10. 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. Appropriate segregation of excavated media on-Site.
11. Collection and analysis of three end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
12. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
13. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
14. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
15. 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.
16. As part of development, installation of a vapor barrier system below the concrete slab of the building as well as behind foundation walls of the proposed building. The vapor barrier will consist of the VaporBlock 20 Plus system as manufactured by Ravens Industries or equivalent system.
17. Construction and maintenance of an engineered composite cover consisting of the 6 inch thick concrete cellar slab to prevent human exposure to residual soil/fill remaining under the Site.
18. 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.

19. 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.

Construction 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 CHASP. The Site Safety Coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site Safety Coordinator is Mr. Kevin Waters of Environmental Business Consultants. Mr. Waters can be reached at (631) 504-6000.

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 on-Site Project Manager, Mr. Kevin Waters at (631) 504-6000 or NYC Office of Environmental Remediation Project Manager, Eric Ilijevich (212) 341-2034.

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 7:00AM to 6:00PM Monday through Friday.

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, Mr. Kimberly Somers (EBC) at (631) 504-6000, the NYC Office of Environmental Remediation Project Manager, Eric Ilijevich at (212) 341-2034, 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 online at OER's website.

Long-Term Site Management. To provide long-term protection after the cleanup is complete, the property owner will be required to comply with an ongoing Site Management Plan 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

Superb Apartments LLC has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 77 Clay Street in the Greenpoint section of Brooklyn, 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 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 at 77 Clay Street in the Greenpoint section of Brooklyn, New York, and is currently identified as Block 2483, Lot 62 on the New York City Tax Map. Figure 1 shows the Site location. Both lots are rectangular shaped lots each consisting of 25 feet of street frontage on Clay Street and a depth of approximately 100 feet for a total of approximately 2,500 ft^2. The Site is located on the north side of Clay Street, between Manhattan Avenue and McGuinness Boulevard. The Site is bordered by mixed-use buildings to the west; an undeveloped lot to the east; parking to the north; and Clay Street to the south. A map of the site boundary is shown on Figure 2.

The Site is improved with one three-story residential building with a full basement and rear yard. The building is currently vacant.

1.2 Proposed Redevelopment Plan

The proposed future use of the Site will consist of developing the lot with a new 4-story apartment building with a full cellar level. The cellar level will consist of 1,603 ft^2 and will include a mechanical room, two open cellar areas (not to be used for living or sleeping rooms), a

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tenant laundry room, two bathrooms, and three stairwells. Floors 1 through 4 will consist of residential apartments and tenant corridors. The cellar will require excavation of 65% of the lot to a depth of approximately 10 feet below grade with additional excavation of approximately 1 ft for the rear at-grade courtyard. Therefore, an estimated 633 cubic yards (950 tons) of soil will require excavation for the new building's cellar.

Layout of the redevelopment plans for the cellar and first floor are presented in Figure 3. The current zoning designation is M1-2 / R6A. The proposed use is consistent with existing zoning for the property.

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

1.3 Description of Surrounding Property

The area immediately surrounding Site consists of a mix new and older residential buildings, and undeveloped lots. Figure 4 shows the surrounding land usage of the adjacent properties listed below as well as additional properties located up to 500 feet away from the Site. No hospitals, schools or daycare facilities are located within a 250 ft radius of the Site.

Surrounding Property Usage

Direction	Property Description
North – Adjacent Property	Block 2483, Lot 11 – 44 Box Street An undeveloped parcel in use as a 5,000 sf asphalt-paved private parking lot.
South – Opposite Clay Street	Block 2488 Lot 10 – 88 Clay Street A four-story residential building on a 2,500 sf parcel, constructed in 1930.
East – Adjacent Property	Block 2483, Lot 61 – 79 Clay Street An undeveloped 2,500 sf vacant lot.
West – Adjacent Property	Block 2483, Lots 1, 2 and 3 – 1116 – 1122 Manhattan Avenue Three, three-story mixed-use buildings, constructed in the early 1930s.

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1.4 Remedial Investigation

A remedial investigation was performed and the results are documented in a companion document called "*Remedial Investigation Report, 77 Clay Street, Brooklyn, NY*", dated January 2015 (RIR).

Summary of Past Uses of Site and Areas of Concern

A Phase I screening was competed by EBC in September 2014. The following Site history was established based on historic Sanborn maps:

The Site was developed prior to 1887 with what appears to be the existing three-story structure. At this time it was used as a paint shop. In 1905, three storage buildings were added along the west property line with a fourth located at the rear of the property; and the main building is labeled as a store. The building continues in this configuration through 1942. By 1951, two of the west storage sheds and the rear shed appear to have been removed; the property remains labeled as a store. Sometime between 1951 and 1954, the property was converted to all residential use. Between 1965 and 1978 the remaining western shed appears to have been expanded to the entire width of the property. The property remains in this configuration through the present time.

The property was assigned an E-designation (E-138) for Hazmat during the Greenpoint-Williamsburg rezoning action completed by the City in May 2005.

Areas of Concern (AOCs) identified for the Site include:

1. The presence of historic fill material to depths as great as 4 feet.
2. The presence of a fuel oil storage tank on-site.
3. Previous use as a paint shop.

Summary of the Work Performed under the Remedial Investigation

EBC performed the following scope of work at the Site in January of 2015:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);

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2. Installed 3soil borings across the Site, and collected 5 soil for chemical analysis from the soil borings to evaluate soil quality;
3. Installed 2 groundwater monitoring wells throughout the Site and collected 2 groundwater samples and one duplicate groundwater sample for chemical analysis to evaluate groundwater quality; and
4. Installed 1 sub-slab soil gas implant and 2 soil vapor probes across the Site and collected 3 samples for chemical analysis.

Summary of Environmental Findings

1. The elevation of the Site is approximately 12 feet.
2. Depth to groundwater is estimated to be approximately 9 feet below sidewalk grade.
3. Regional groundwater flow is generally east/northeast.
4. Depth to bedrock is at the Site is greater than 100 feet.
5. The stratigraphy of the Site from the surface down consists of historic fill material to depths as great as 4 feet, underlain by native brown silty sand.
6. Soil/fill samples results were compared to NYSDEC Unrestricted Use Soil Cleanup Objectives (Track 1) and Restricted Residential Use Soil Cleanup Objectives (Track 2) as presented in 6NYCRR Part 375-6.8 and CP51. Soil/fill samples detected no PCBs in any of the shallow or deep soil samples. VOCs were detected in both shallow and deep soil samples, but at concentrations below Unrestricted Use SCOs and Restricted Residential Use SCOs. SVOCs were detected in shallow soils, including benz(a)anthracene (4,500 µg/kg), benzo(a)pyrene (3,700 µg/kg), benzo(b)fluoranthene (4,600 µg/kg), chrysene (4,800 µg/kg), dibenzo(a)anthracene (650 µg/kg), and indeno(1,2,3-cd)pyrene (2,400 µg/kg) were detected above Restricted Residential Use SCOs in one shallow soil sample (B-1). Several metals including arsenic (22.6 mg/kg), barium (386 mg/kg), cadmium (2.64 mg/kg), chromium (max. of 101 µg/kg), copper (max. of 157 µg/kg), lead (916 mg/kg), mercury (2.33 mg/kg) and zinc (max. of 783 µg/kg) were detected above Unrestricted Use SCOs; and of these arsenic, barium, cadmium, lead and mercury also exceeded Restricted residential use SCOs. All shallow metal exceedances were detected in one shallow soil boring (B-1). One metal, chromium (101 µg/kg) was detected in one

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deeper soil sample above Unrestricted Use SCO. Pesticides including 4,4-DDE (490 µg/kg); 4,4-DDT (20 µg/kg); 4,4-DDD (14 µg/kg) and dieldrin (27 µg/kg) were detected above Unrestricted Use SCOs in two shallow soils sample. Overall, the soil results were consistent with data identified at sites with historic fill material in NYC with the exception of boring B-1, which was elevated for metals and SVOCs. Boring B-1 is located in proposed rear yard area. Groundwater samples results were compared to the NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards (GQS) for Class GA (drinking water). Groundwater samples showed no Pesticides or PCBs at detectable concentrations. One VOC, acetone, was detected above GQS in both groundwater samples. Several SVOCs were detected above GQS, including benzo(a)anthracene (max. of 0.08 µg/L), benzo(a)pyrene (0.06 µg/L), benzo(b)fluoranthene (0.08 µg/L), benzo(k)fluoranthene (0.04 µg/L), chrysene (0.07 µg/L), and indeo(1,2,3-cd)pyrene (0.03 µg/L). Several metals were identified, but only magnesium (35.2 mg/L), manganese (max of 0.862 mg/L) and sodium (32.8 mg/L) exceeded their respective GQS in groundwater samples.

8. Soil vapor samples collected during the 2014 EBC RI were compared to the New York State Department of Health (NYSDOH) Final Guidance on Soil Vapor Intrusion (October 2006) Matrix 1 and Matrix 2 values. Total concentrations of petroleum-related VOCs (BTEX) ranged from 25.17 µg/m3 to 82.99 µg/m3. The CVOC trichloroethylene (TCE) was not detected in any of the soil gas samples. Tetrachloroethylene (PCE) was detected in all three soil gas samples ranging in concentration from 0.271 µg/m3 to 0.678 µg/m3. Carbon tetrachloride was detected in one soil gas sample at a concentration of 0.629 µg/m3. 1,1,1-trichloroethane was not detected in any of the three soil gas samples. The PCE concentrations are below the monitoring level ranges established within the State NYSDOH soil vapor guidance matrix. The PCE concentrations are below the monitoring level ranges established within the NYSDOH Final Guidance on Soil Vapor Intrusion.

For more detailed results, consult the RIR. Based on an evaluation of the data and information from the RIR and this RAWP, disposal of significant amounts of hazardous waste is not suspected at this site.

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2.0 REMEDIAL ACTION OBJECTIVES

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

Groundwater

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

Soil

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

Soil Vapor

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

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3.0 REMEDIAL ALTERNATIVES ANALYSIS

The goal of the remedy selection process under 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 alternative analysis and remedy selection to address impacted media at the Site. As required, a minimum of two remedial alternatives (including a Track 1 Unrestricted Use scenario) are evaluated, as follows:

Alternative 1 involves:

- Selection of NYSDEC 6NYCRR Part 375 Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs).
- Removal of all soil/fill exceeding Track 1 Unrestricted Use SCOs throughout the Site and confirmation that Track 1 Unrestricted Use SCOs have been achieved with post-excavation endpoint sampling. If soil/fill containing analytes at concentrations above Track 1 Unrestricted Use SCOs is still present at the base of the excavation after removal

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of all soil required for construction of the new building's cellar is complete, additional excavation will be performed to ensure complete removal of soil that does not meet Track 1 Unrestricted Use SCO;

- No Engineering or Institutional Controls are required for a Track 1 Unrestricted Use cleanup, but installation of a vapor barrier beneath the basement foundation and behind foundation sidewalls of the new building as a part of development to prevent any potential future exposures from off-Site soil vapor; and
- Placement of a final cover over the entire Site as part of new development.

Alternative 2 involves:

- Establishment of Site-Specific (Track 4) SCOs.
- Removal of all soil/fill exceeding Track 4 Site-Specific SCOs and confirmation that Track 4 Site-Specific SCOs have been achieved with post-excavation endpoint sampling. Excavation for construction of the new building's cellar level would take place to a depth of approximately 10 feet below grade across 65% of the Site. Additional excavation will be performed in shallow hot spot area at location B-1 in rear yard. If soil/fill containing analytes at concentrations above Track 4 Site-Specific SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building's cellar is complete, additional excavation will be performed to ensure complete removal of soil that does not meet Track 4 Site-Specific SCOs;
- Placement of a final cover over the entire Site to prevent exposure to remaining soil/fill;
- Installation of a soil vapor barrier system beneath the buildings slab, and along foundation side walls to prevent any potential future exposures from off-Site soil vapor;
- Establishment of use restrictions including prohibitions on the use of groundwater from the Site; prohibitions of 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;
- Establishment of an approved Site Management Plan (SMP) to ensure long-term management of these Engineering and Institutional Controls including the performance of

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periodic inspections and certification that the controls are performing as they were intended; and

- Continued registration as an E-designated property to memorialize the remedial action and the Engineering and Institutional Controls required by the 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 Unrestricted Use 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. The vapor barrier would prevent any soil vapors from entering the new building.

Alternative 2 would achieve comparable protections of human health and the environment by excavating the historic fill at the Site 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. The vapor barrier would mitigate any vapor issues from entering the building. Implementing Institutional Controls including a Site Management Plan would ensure that the composite cover system remains intact and protective. Establishment of Track 4 Site-Specific SCOs would minimize the risk of contamination leaching into groundwater.

For both Alternatives, potential exposure to contaminated soils during construction would be minimized by implementing a Construction Health and Safety Plan (CHASP), an approved

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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 future migration of off-Site soil vapors into the new building would be prevented by installing a vapor barrier system below the new building's cellar slab and continuing the vapor barrier around foundation walls.

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 Unrestricted Use SCOs and Groundwater Protection Standards. Compliance with SCGs for soil vapor would also be achieved by installing a vapor barrier system below the new building's cellar slab and continuing the vapor barrier around foundation walls, as part of development.

Alternative 2 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil to meet Track 4 Site-Specific SCOs. Compliance with SCGs for soil vapor would also be achieved by installing a vapor barrier system below the new building's cellar slab and continuing the vapor barrier around foundation walls. A Site Management Plan would ensure that these controls remained protective for the long term.

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. 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. 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

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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 1 and 2 have similar short-term effectiveness during their respective implementations, as each requires excavation of historic fill material. Both alternatives would result in short-term dust generation impacts associated with excavation, handling, load out of materials, and truck traffic. Short term impacts could potentially be higher for Alternative 1 if excavation of greater amounts of historical fill material is encountered below the excavation depth of the proposed building. However, focused attention to means and methods during the remedial action during a Track 1 removal action, including community air monitoring and appropriate truck routing, would minimize or negate the overall impact of these activities.

An additional short-term adverse impact and risks to the community associated with both remedial alternatives is increased truck traffic. Approximately 36, 25-ton capacity truck trips would be necessary to transport fill and soil excavated during Site development. 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.

The effects of these potential adverse impacts to the community, workers and the environment will be minimized through implementation of corresponding control plans 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 Construction Health and Safety Plan (CHASP) would be protected from on-Site contaminants (personal protective equipment would be worn consistent with the documented risks within the respective work zones).

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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 maintaining continued registration as an E-designation property to memorialize these controls for the long term. The SMP would 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 a continued high level of protection in perpetuity.

Both alternatives would result in removal of soil contamination exceeding the SCOs providing the highest level, most effective and permanent remedy over the long-term with respect to a remedy for contaminated soil, which would eliminate any migration to groundwater. Potential sources of soil vapor and groundwater contamination would also be eliminated as part of the remedy.

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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 Unrestricted Use SCOs.

Alternative 2 would remove most, if not all, of the historic fill at the Site, and any remaining on-Site soil beneath the new building and at-grade rear courtyard will meet Track 4 - Site-Specific SCOs. Alternative 1 would eliminate a greater total mass of contaminants on-Site.

The removal of soil across 65% of the Site to approximately 10 feet for the new development in both scenarios would probably result in relatively minor differences between these two alternatives.

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 proposed remedial action is both feasible and implementable. 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

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and services that are well established technology. The reliability of each remedy is also high. There are no special difficulties associated with any of the activities proposed.

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.

Since historic fill at the Site was only found during the RI to extend to a depth of up to 4 feet below grade, and the new building requires excavation of 65% of the Site to a depth of approximately 10 feet, the costs associated with both Alternative 1 would be significantly higher because of additional excavations required in rear yard area to achieve Track 1 Unrestricted Use SCOs. Additional long-term costs would be required for Alternative 2 based on implementation of a Site Management Plan as part of Alternative 2.

The remedial plan creates an approach that combines the remedial action with the redevelopment of the Site, including the construction of the building foundation and subgrade structures. The remedial plan is also cost effective in that it will take into consideration the selection of the closest and most appropriate disposal facilities to reduce transportation and disposal costs during the excavation of historic fill and other soils during the redevelopment of the Site.

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. 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 Attachment B.

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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 Unrestricted Use or Track 4 Site-Specific SCOs, both of which are appropriate for its planned residential use. Improvements in the current environmental condition of the property achieved by both alternatives are also consistent with the City's goals for cleanup of contaminated land 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.

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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. New York City Clean Soil Bank program may be utilized for reuse of import soils. To the extent practicable, energy efficient building materials, appliances, and equipment will be utilized to complete the development. While Alternative 2 would potentially result in 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 C.

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4.0 REMEDIAL ACTION

4.1 Summary of Preferred Remedial Action

The preferred remedial action alternative is the Track 4 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. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility. A Waste Characterization Report documenting sample procedures, location, analytical results shall be submitted to NYCOER prior to start of remedial action.
4. Establishment of Site-Specific (Track 4) Soil Cleanup Objectives (SCOs).
5. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
6. Excavation and removal of soil/fill exceeding Track 4 Site-Specific SCOs. For development purposes, 65% of the Site will require excavation to a depth of approximately 10 feet below grade for the building cellar level, with additional excavation of approximately 1 ft for the rear at-grade courtyard. Additional excavation will be required in the rear courtyard area to remove a metal and SVOC hotspot to achieve Track 4 Site-Specific SCOs. Approximately 950 tons of soil will be removed.
7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring w ith a PID. Appropriate segregation of excavated

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media on-Site.

8. Management of excavated materials including temporarily stockpiling and segregating to prevent co-mingling of contaminated material and non-contaminated materials.
9. 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.
10. 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. Appropriate segregation of excavated media on-Site.
11. Collection and analysis of three end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
12. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
13. Installation of a vapor barrier system below the concrete slab of the building as well as behind foundation walls of the proposed building. The vapor barrier will consist of Raven Industries' VaporBlock 20 Plus, which is a seven layer co-extruded barrier made from state-of-the-art polyethylene and EVOH resins.
14. Construction and maintenance of an engineered composite cover consisting of the 6 inch thick concrete cellar slab to prevent human exposure to residual soil/fill remaining under the Site.
15. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
16. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
17. 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.

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18. 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.
19. 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

The SCOs for this Site are listed in the 6NYCRR Part 375, Table 6.8(b) Track 2 (Restricted Residential Use) SCOs as amended by the following Site-Specific Track 4 SCOs:

Contaminant	**Track 4 SCOs**
Arsenic	23 ppm
Barium	500 ppm
Lead	800 ppm
Mercury	2.0 ppm

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 Attachment D. The location of planned excavations is shown in Figure 5.

No over-excavation beyond the development cut is anticipated. If any hot-spot areas are identified during development and remediation at the Site, they will be removed to the extent practical.

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Discrete contaminant sources (such as hotspots) identified during the remedial action will be identified by GPR or survey. 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 950 tons. Disposal location(s) will be reported promptly to the OER Project Manager prior to the start of the remedial action.

End-Point Sampling

Removal actions under this plan will be performed in conjunction with remedial end-point sampling. Confirmation end-point sampling and testing will be performed following materials removal and completed proper to Site development activities. To evaluate attainment of Track 4 Site-Specific SCOs, three confirmation end-point samples will be collected and analyzed for the trigger compounds (VOCs, SVOCs and metals) and elements established on the Track 4 Site-Specific SCOs list from within the building footprint. Additional endpoint soil samples will be collected and analyzed for SVOCs and metals from each of the hotspots located at the rear at-grade courtyard area and mid-portion of the site after excavation of the hot-spot areas. The approximate collection location of the confirmation end-point soil samples is shown on Figure 6.

In addition, if additional hotspots are encountered, hotspot removal end-point sampling frequency will consist of the following:

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.

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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 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 end-point sample analyses. Labs for end-point sample analyses will be reported in the RAR. The RAR will provide a tabular and map summary of all end-point sample results and will include all data including non-detects and applicable standards and/or guidance values. End-point samples will be analyzed for trigger analytes (those for which SCO exceedence is identified) 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 required regulatory reporting (i.e. spills hotline) will be performed.

Quality Assurance/Quality Control

The fundamental QA objective with respect to accuracy, precision, and sensitivity of analysis for laboratory analytical data is to achieve the QC acceptance of the analytical protocol. The

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accuracy, precision and completeness requirements will be addressed by the laboratory for all data generated.

One duplicate sample for every 20 samples collected will be submitted to the approved laboratory for analysis of the same parameters. One trip blank will be submitted to the laboratory with each shipment of soil samples.

Collected samples will be appropriately packaged, placed in coolers and shipped via overnight courier or delivered directly to the analytical laboratory by field personnel. Samples will be containerized in appropriate laboratory provided glassware and shipped in plastic coolers. Samples will be preserved through the use of ice or "cold-paks" to maintain a temperature of $4^{o}C$.

Dedicated disposable sampling materials will be used for the collection 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-dedicated 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

Prepare field blanks 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. Trip 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.

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Import and Reuse of Soils

Import of soils onto the property and reuse of soils already on-Site will be performed in conformance with the Soil/Materials Management Plan in Attachment D. The estimated quantity of soil to be imported into the Site for backfill and cover soil is 0 tons. The estimated quantity of on-Site soil/fill expected to be reused/relocated on Site is 0 tons.

4.3 Engineering Controls

The excavation required for the proposed Site development will achieve Track 4 Site Specific SCOs. Engineering Controls are required in the remedial action to address residual contamination remaining at the Site. The Site has three primary Engineering Control Systems: composite cover system, sub-slab depressurization system and vapor barrier system.

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 the 6 inch thick concrete cellar slab.

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. Figure 5 shows the location of the composite cover system.

Vapor Barrier

Migration of potential soil vapor from on-Site or off-Site in the future will be mitigated with a vapor barrier. The vapor barrier will consist of Raven Industries' VaporBlock 20 Plus, which is a seven layer co-extruded barrier made from state-of-the-art polyethylene and EVOH resins. The vapor barrier will be installed prior to pouring the building's concrete slab. The vapor barrier will extend throughout the area occupied by the footprint of the new buildings and up the foundation

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sidewalls in accordance with manufacturer specifications. The specifications for installation will be provided to the construction management company and the foundation contractor or installer of the liner. The specifications state that all vapor barrier seam, penetrations, and repairs will be sealed either by the tape method or weld method, according to the manufacturer's recommendations and instructions.

The project's Professional Engineer licensed by the State of New York will have primary direct responsibility for overseeing the implementation of the vapor barrier. The extent of the proposed vapor barrier membrane is provided in Figure 7. Product specification sheets are provided in Attachment F.

The Remedial Action Report will include photographs (maximum of two photos per page) of the installation process, PE/RA certified letter (on company letterhead) from primary contractor responsible for installation oversight and field inspections, and a copy of the manufacturers certificate of warranty.

4.4 Institutional Controls

Institutional Controls (IC) have been incorporated 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 established in 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:

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(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(l)(3);

- Vegetable gardens and farming on the Site are prohibited;
- 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; and
- 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 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 this RAWP and 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 Voluntary 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 on a periodic

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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 July 30 of the year following the reporting period.

4.6 Qualitative Human Health Exposure Assessment

Investigations reported in the Remedial Investigation Report (RIR) are sufficient to complete a Qualitative Human Health Exposure Assessment (QHHEA).

The objective of the qualitative exposure assessment is to identify potential receptors 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 EA 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

Based on the results of the Remedial Investigation Report the contaminants of concern found are:

Soil

- Metals, including arsenic, barium, cadmium, lead and mercury exceeding Restricted Residential Use SCOs;
- SVOCs (PAH compounds) including benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene

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were identified above Restricted Residential Use SCOs, and benzo(k)anthracene was identified above the Unrestricted Use SCO; and

- Pesticides, including 4,4'-DDD, 4,4'-DDE and 4,4'-DDT, were identified but did not exceed Restricted Residential Use SCOs.

Groundwater

- One VOC, acetone and several SVOCs (PAH compounds) including benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene were identified above GQS; and
- Metals, including magnesium, manganese, and sodium were detected above GQS in the filtered groundwater samples.

Soil Vapor

- Petroleum VOCs detected at moderate concentrations including benzene, toluene, ethyl-benzene and xylenes.

Nature, Extent, Fate and Transport of Contaminants

SVOCs, metals, and pesticides are present in the historic fill materials to depths of 4 feet below grade. No SVOCs or pesticides were detected within any of the soil samples collected from the native soil layer below the historic fill material layer. Boring location B2 located under the existing three-story building is identified as a metal hot-spot, with the metal chromium (101 mg/kg) exceeding the Unrestricted Use SCO. SVOCs including benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene and indeno(1,2,3-cd)pyrene detected in one shallow soil sample at the Site were also detected above GQS in groundwater. No chlorinated VOCs were detected in on-Site soil above Unrestricted Use SCOs, and no chlorinated VOCs were detected above GQS in groundwater.

Potential Routes of Exposure

The five elements of an exposure pathway are: (1) a contaminant source; (2) contaminant release and transport mechanisms; (3) a point of exposure; (4) a route of exposure; and (5) a receptor

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

Existence of Human Health Exposure

Current Conditions: A potential for exposure to surficial historic fill exists under current conditions but is limited due to the rear yard. The Site is served by public water supply and groundwater use for potable supply is prohibited, groundwater is not used at the Site and there is no potential for exposure. Due to the low detections of chlorinated VOCs and BTEX in the on-site soils, the potential for accumulation of soil vapor into the building does not exist.

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. 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 remedial action, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through the implementation of the Soil/Materials Management Plan, stormwater pollution prevention, dust controls, and through the implementation of the Community Air-Monitoring Program and a Construction Health and Safety Plan.

Proposed Future Conditions: Under future remediated conditions, all soils in excess of Track 4 Site-Specific SCOs will be removed. The Site will be fully capped, limiting potential direct exposure to soil and groundwater remaining in place, and a vapor barrier system will prevent any exposure to potential off-Site soil vapors in the future. The Site is served by a public water

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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 developed with a three-story residential building with a rear yard. The property is vacant, and the yard areas are overgrown with vegetation. 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.

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 0.25 mile) - existing and future
5. Schools (up to 0.25 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. Under current conditions, on-Site exposure pathways exist for Site personnel and trespassers. 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. There is no complete exposure pathway under future conditions after the Site is developed. After the remedial action is complete, there will be no remaining exposure pathways to on-Site soil/fill, as all soil above Track 4 Site Specific SCOs will have been removed and a vapor barrier system will have been installed as part of

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development. The vapor barrier system will prevent potential vapor intrusion. The composite cover system and use restrictions will prevent contact with residual soil or groundwater and continued protection after the remedial action will be achieved by the implementation of site management including periodic inspection and certification of the performance of remedial controls. 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. This assessment takes into consideration the reasonably anticipated use of the Site, which includes a residential structure, site-wide impervious surface cover cap, and a vapor barrier for the building.

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5.0 REMEDIAL ACTION MANAGEMENT

5.1 Project Organization and Oversight

Principal personnel who will participate in the remedial action include Kimberly Somers, Project Manager-EBC and Kevin Waters, Field Operations Officer-EBC. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Ariel Czemerinski P.E., AMC Engineering and Charles Sosik P.G. EBC.

5.2 Site Security

Site access will be controlled by a chain link or wooden construction fence, which will surround the property.

5.3 Work Hours

The hours for operation of remedial construction will be from 7:00AM to 6:00PM. These hours conform to the New York City Department of Buildings construction code requirements.

5.4 Construction Health and Safety Plan

The Health and Safety Plan is included in Appendix E. The Site Safety Coordinator will be Kevin Waters - EBC. 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

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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. Exceedances 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.

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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

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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/m^3 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/m^3 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/m^3 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.

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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 incompliance 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.

Dewatering

Groundwater is present at approximately 9 feet below grade and excavation to a depth of approximately 10 feet is anticipated; therefore, dewatering of groundwater during construction will be necessary. The water will be disposed into the New York City combined sanitary/storm sewer system. A permit to discharge will be obtained from the New York City Department of Environmental Protection (NYCDEP). As part of the permit to discharge, the location of

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discharge will be based on the Site-Specific requirements of the DEP. The need for pretreatment will be determined by DEP's requirements for the discharge permit. If pretreatment is required by the DEP, it will be performed in accordance with the requirements of the DEP.

Equipment and Material Staging

Equipment and materials will be stored and staged in a manner that complies with applicable laws and regulations. Staging locations will be reported to OER prior to the start of the remedial action.

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.

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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; lose 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 by 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

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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 on-Site 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 it 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.

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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 is shown on Figure 9.

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.);

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- 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:

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- 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.

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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;
- 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.
- 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.

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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, _____, 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 project at 77 Clay Street, Brooklyn, NY, NYC VCP Site number TBD.

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.

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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 2 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	2	6
Demobilization	8	1
Submit Remedial Action Report	15	-

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TABLES

TABLE 1
Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
METALS							
Arsenic	7440-38 -2	16[f]	16[f]	16[f]	16[f]	13[f]	16[f]
Barium	7440-39 -3	350[f]	400	400	10,000 [d]	433	820
Beryllium	7440-41 -7	14	72	590	2,700	10	47
Cadmium	7440-43 -9	2.5[f]	4.3	9.3	60	4	7.5
Chromium, hexavalent [h]	18540-29-9	22	110	400	800	1[e]	19
Chromium, trivalent[h]	16065-83-1	36	180	1,500	6,800	41	NS
Copper	7440-50 -8	270	270	270	10,000 [d]	50	1,720
Total Cyanide [h]		27	27	27	10,000 [d]	NS	40
Lead	7439-92 -1	400	400	1,000	3,900	63[f]	450
Manganese	7439-96 -5	2,000[f]	2,000[f]	10,000 [d]	10,000 [d]	1600[f]	2,000[f]
Total Mercury		0.81[j]	0.81[j]	2.8[j]	5.7[j]	0.18[f]	0.73
Nickel	7440-02 -0	140	310	310	10,000 [d]	30	130
Selenium	7782-49 -2	36	180	1,500	6,800	3.9[f]	4[f]
Silver	7440-22 -4	36	180	1,500	6,800	2	8.3
Zinc	7440-66 -6	2200	10,000 [d]	10,000 [d]	10,000 [d]	109[f]	2,480
PESTICIDES / PCBs							
2,4,5-TP Acid (Silvex)	93-72-1	58	100[a]	500[b]	1,000[c]	NS	3.8
4,4'-DDE	72-55-9	1.8	8.9	62	120	0.0033 [e]	17
4,4'-DDT	50-29-3	1.7	7.9	47	94	0.0033 [e]	136
4,4'-DDD	72-54-8	2.6	13	92	180	0.0033 [e]	14
Aldrin	309-00-2	0.019	0.097	0.68	1.4	0.14	0.19
alpha-BHC	319-84-6	0.097	0.48	3.4	6.8	0.04[g]	0.02
beta-BHC	319-85-7	0.072	0.36	3	14	0.6	0.09
Chlordane (alpha)	5103-71 -9	0.91	4.2	24	47	1.3	2.9
delta-BHC	319-86-8	100[a]	100[a]	500[b]	1,000[c]	0.04[g]	0.25
Dibenzofuran	132-64-9	14	59	350	1,000[c]	NS	210
Dieldrin	60-57-1	0.039	0.2	1.4	2.8	0.006	0.1
Endosulfan I	959-98-8	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan II	33213-65-9	4.8[i]	24[i]	200[i]	920[i]	NS	102
Endosulfan sulfate	1031-07 -8	4.8[i]	24[i]	200[i]	920[i]	NS	1,000[c]
Endrin	72-20-8	2.2	11	89	410	0.014	0.06
Heptachlor	76-44-8	0.42	2.1	15	29	0.14	0.38
Lindane	58-89-9	0.28	1.3	9.2	23	6	0.1
Polychlorinated biphenyls	1336-36 -3	1	1	1	25	1	3.2
SEMI-VOLATILES							
Acenaphthene	83-32-9	100[a]	100[a]	500[b]	1,000[c]	20	98
Acenapthylene	208-96-8	100[a]	100[a]	500[b]	1,000[c]	NS	107
Anthracene	120-12-7	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benz(a)anthracene	56-55-3	1[f]	1[f]	5.6	11	NS	1[f]
Benzo(a)pyrene	50-32-8	1[f]	1[f]	1[f]	1.1	2.6	22
Benzo(b) fluoranthene	205-99-2	1[f]	1[f]	5.6	11	NS	1.7
Benzo(g,h,i) perylene	191-24-2	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Benzo(k) fluoranthene	207-08-9	1	3.9	56	110	NS	1.7
Chrysene	218-01-9	1[f]	3.9	56	110	NS	1[f]
Dibenz(a,h) anthracene	53-70-3	0.33[e]	0.33[e]	0.56	1.1	NS	1,000[c]
Fluoranthene	206-44-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Fluorene	86-73-7	100[a]	100[a]	500[b]	1,000[c]	30	386
Indeno(1,2,3-cd) pyrene	193-39-5	0.5[f]	0.5[f]	5.6	11	NS	8.2
m-Cresol	108-39-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
Naphthalene	91-20-3	100[a]	100[a]	500[b]	1,000[c]	NS	12
o-Cresol	95-48-7	100[a]	100[a]	500[b]	1,000[c]	NS	0.33[e]
p-Cresol	106-44-5	34	100[a]	500[b]	1,000[c]	NS	0.33[e]
Pentachlorophenol	87-86-5	2.4	6.7	6.7	55	0.8[e]	0.8[e]
Phenanthrene	85-01-8	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]
Phenol	108-95-2	100[a]	100[a]	500[b]	1,000[c]	30	0.33[e]
Pyrene	129-00-0	100[a]	100[a]	500[b]	1,000[c]	NS	1,000[c]

TABLE 1
Soil Cleanup Objectives

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
VOLATILES							
1,1,1-Trichloroethane	71-55-6	100[a]	100[a]	500[b]	1,000[c]	NS	0.68
1,1-Dichloroethane	75-34-3	19	26	240	480	NS	0.27
1,1-Dichloroethene	75-35-4	100[a]	100[a]	500[b]	1,000[c]	NS	0.33
1,2-Dichlorobenzene	95-50-1	100[a]	100[a]	500[b]	1,000[c]	NS	1.1
1,2-Dichloroethane	107-06-2	2.3	3.1	30	60	10	0.02[f]
cis-1,2-Dichloroethene	156-59-2	59	100[a]	500[b]	1,000[c]	NS	0.25
trans-1,2-Dichloroethene	156-60-5	100[a]	100[a]	500[b]	1,000[c]	NS	0.19
1,3-Dichlorobenzene	541-73-1	17	49	280	560	NS	2.4
1,4-Dichlorobenzene	106-46-7	9.8	13	130	250	20	1.8
1,4-Dioxane	123-91-1	9.8	13	130	250	0.1[e]	0.1[e]
Acetone	67-64-1	100[a]	100[b]	500[b]	1,000[c]	2.2	0.05
Benzene	71-43-2	2.9	4.8	44	89	70	0.06
Butylbenzene	104-51-8	100[a]	100[a]	500[b]	1,000[c]	NS	12
Carbon tetrachloride	56-23-5	1.4	2.4	22	44	NS	0.76
Chlorobenzene	108-90-7	100[a]	100[a]	500[b]	1,000[c]	40	1.1
Chloroform	67-66-3	10	49	350	700	12	0.37
Ethylbenzene	100-41-4	30	41	390	780	NS	1
Hexachlorobenzene	118-74-1	0.33[e]	1.2	6	12	NS	3.2
Methyl ethyl ketone	78-93-3	100[a]	100[a]	500[b]	1,000[c]	100[a]	0.12
Methyl tert-butyl ether	1634-04 -4	62	100[a]	500[b]	1,000[c]	NS	0.93
Methylene chloride	75-09-2	51	100[a]	500[b]	1,000[c]	12	0.05
n-Propylbenzene	103-65-1	100[a]	100[a]	500[b]	1,000[c]	NS	3.9
sec-Butylbenzene	135-98-8	100[a]	100[a]	500[b]	1,000[c]	NS	11
tert-Butylbenzene	98-06-6	100[a]	100[a]	500[b]	1,000[c]	NS	5.9
Tetrachloroethene	127-18-4	5.5	19	150	300	2	1.3
Toluene	108-88-3	100[a]	100[a]	500[b]	1,000[c]	36	0.7
Trichloroethene	79-01-6	10	21	200	400	2	0.47
1,2,4-Trimethylbenzene	95-63-6	47	52	190	380	NS	3.6
1,3,5-Trimethylbenzene	108-67-8	47	52	190	380	NS	8.4
Vinyl chloride	75-01-4	0.21	0.9	13	27	NS	0.02
Xylene (mixed)	1330-20 -7	100[a]	100[a]	500[b]	1,000[c]	0.26	1.6

All soil cleanup objectives (SCOs) are in parts per million (ppm). NS=Not specified. See Technical Support Document (TSD). Footnotes

a The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm. See TSD section 9.3.

b The SCOs for commercial use were capped at a maximum value of 500 ppm. See TSD section 9.3.

c The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm. See TSD section 9.3.

d The SCOs for metals were capped at a maximum value of 10,000 ppm. See TSD section 9.3.

e For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the SCO value.

FIGURES

USGS Brooklyn Quadrangle 1995, Contour Interval = 10 feet

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77 CLAY STREET
BROOKLYN, NY

FIGURE 1 SITE LOCATION MAP

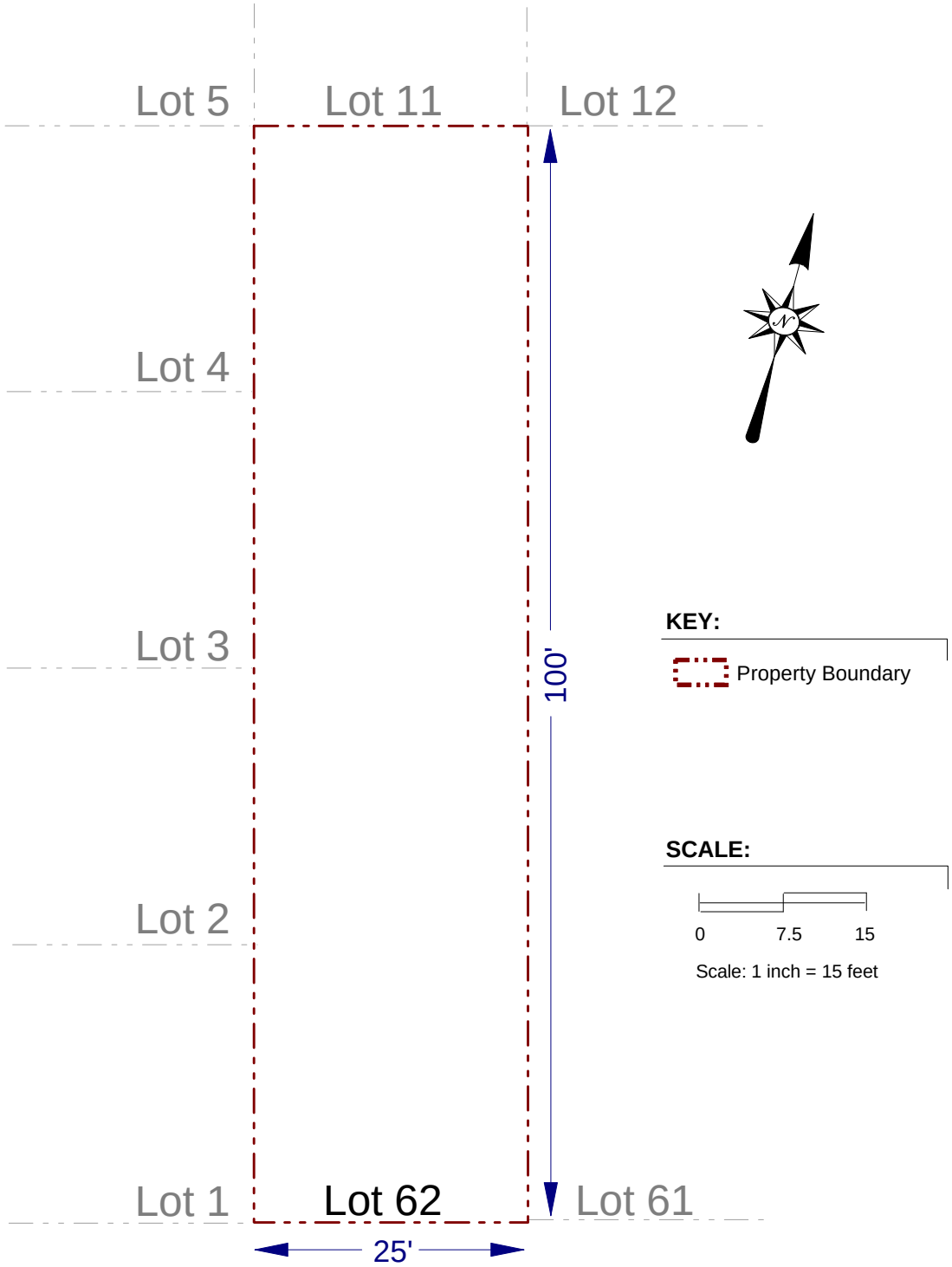

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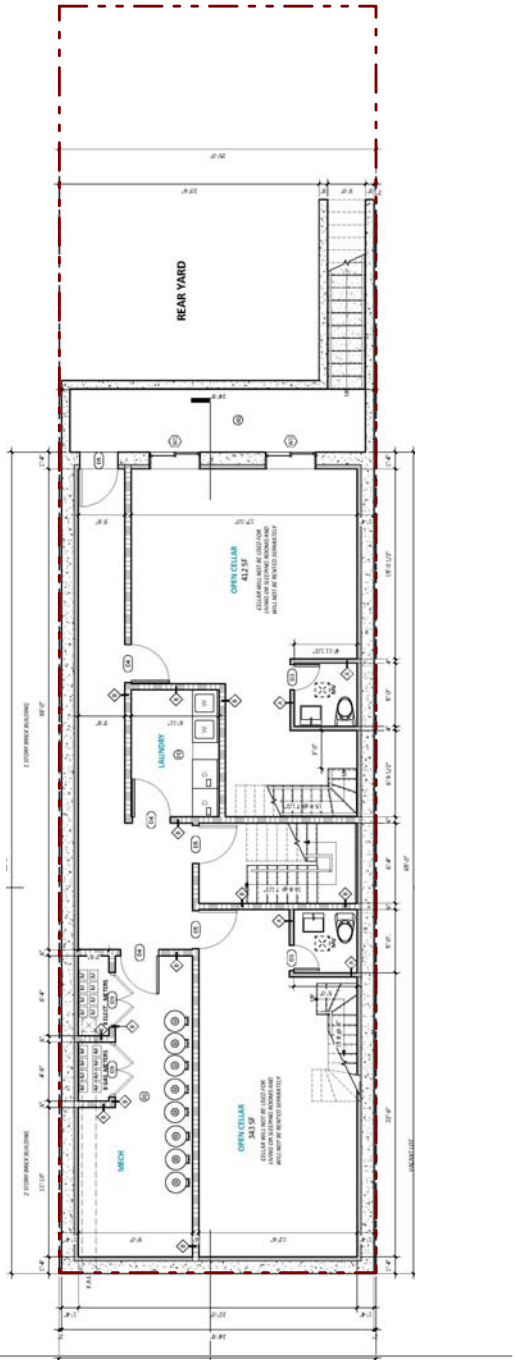
Figure No. 2

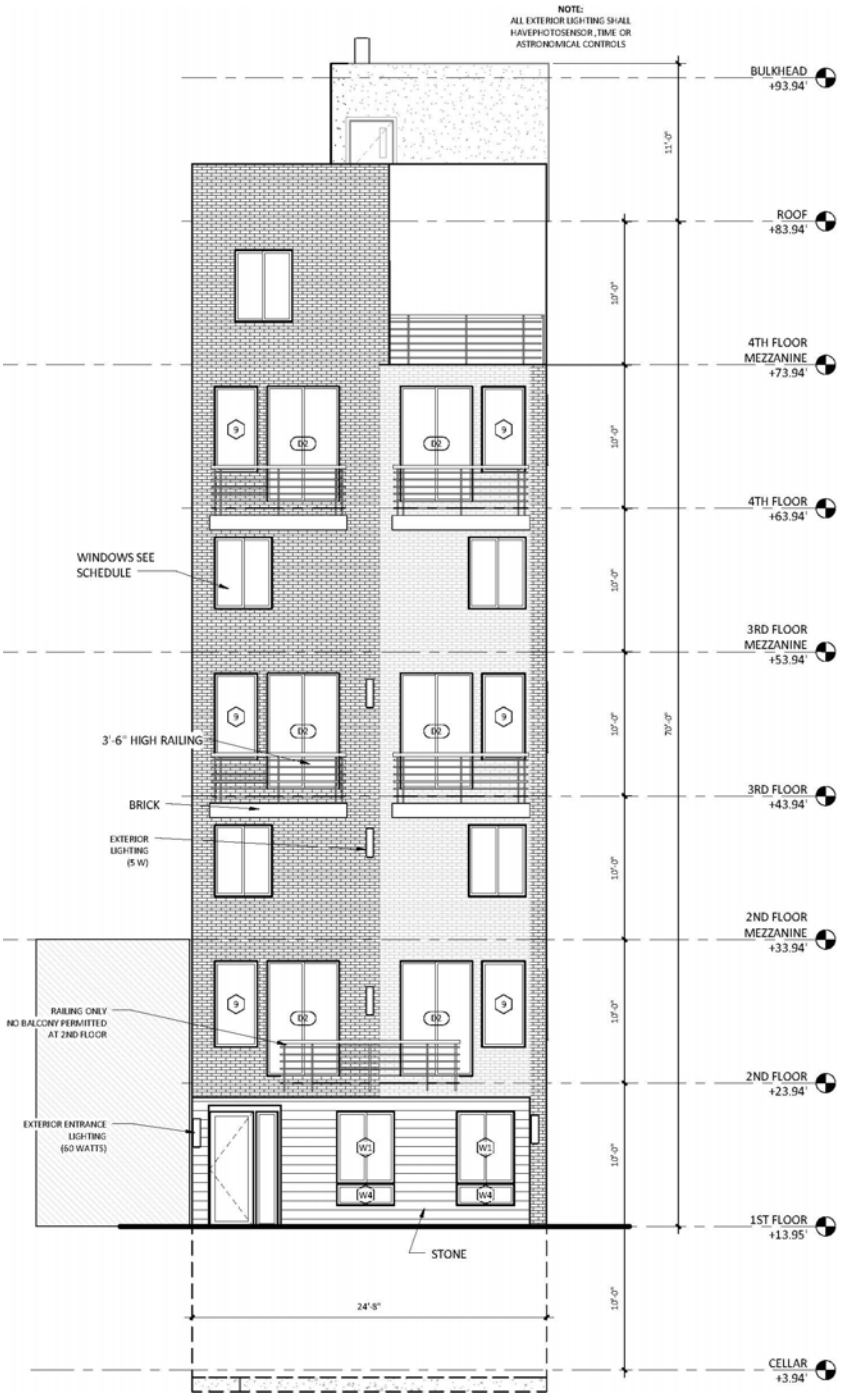
Site Name: Redevelopment Project
Site Address: 77 Clay Street, Brooklyn, NY
Drawing Title: Site Boundary Map

CELLAR FLOOR PLAN



CLAY STREET

FRONT ELEVATION



KEY:

Property Boundary

SCALE:

0 10 15

Scale: 1 inch = 15 feet

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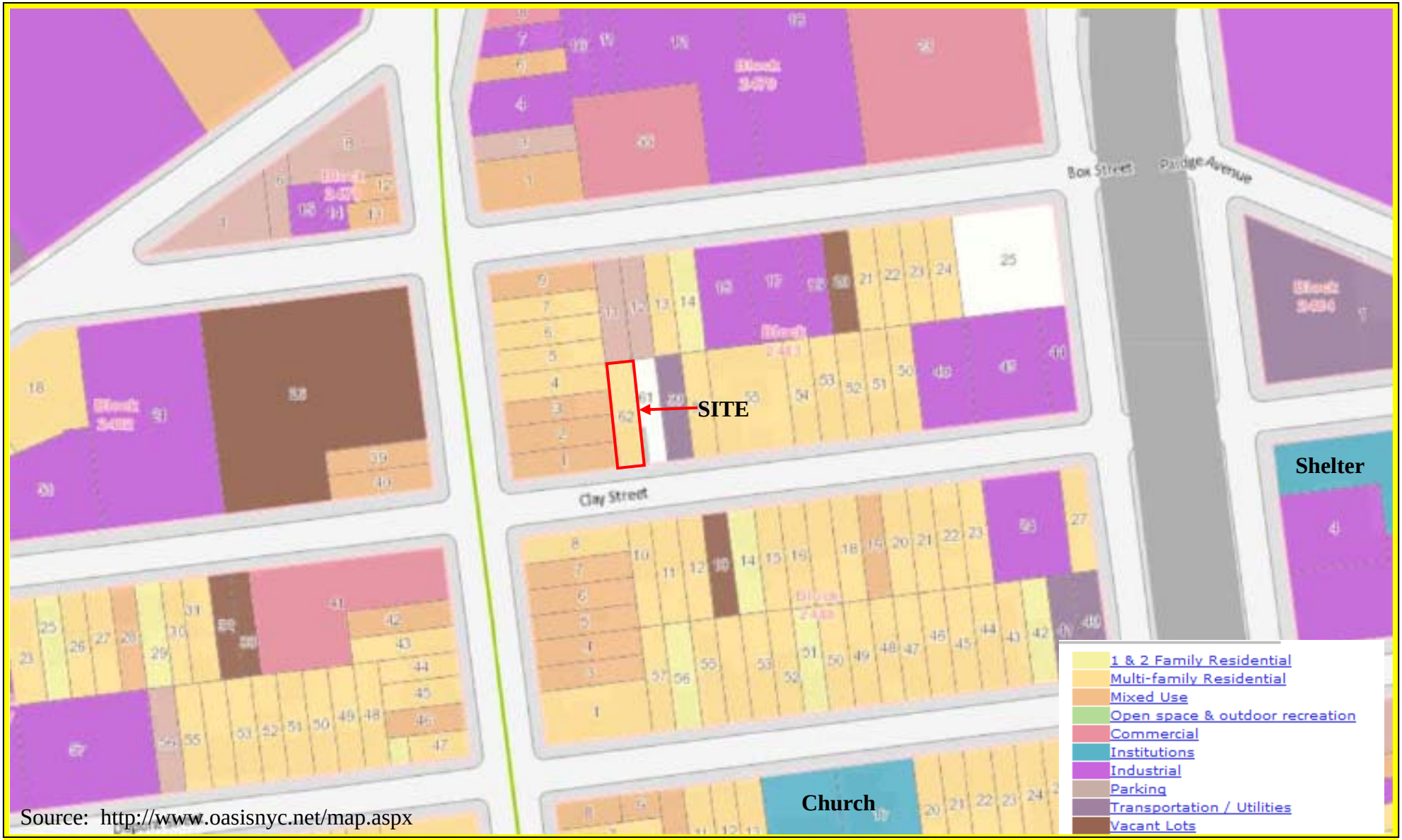
Figure No. 3

Site Name: REDEVELOPMENT PROJECT

Site Address: 77 CLAY STREET, BROOKLYN, NY

Drawing Title: REDEVELOPMENT PLAN



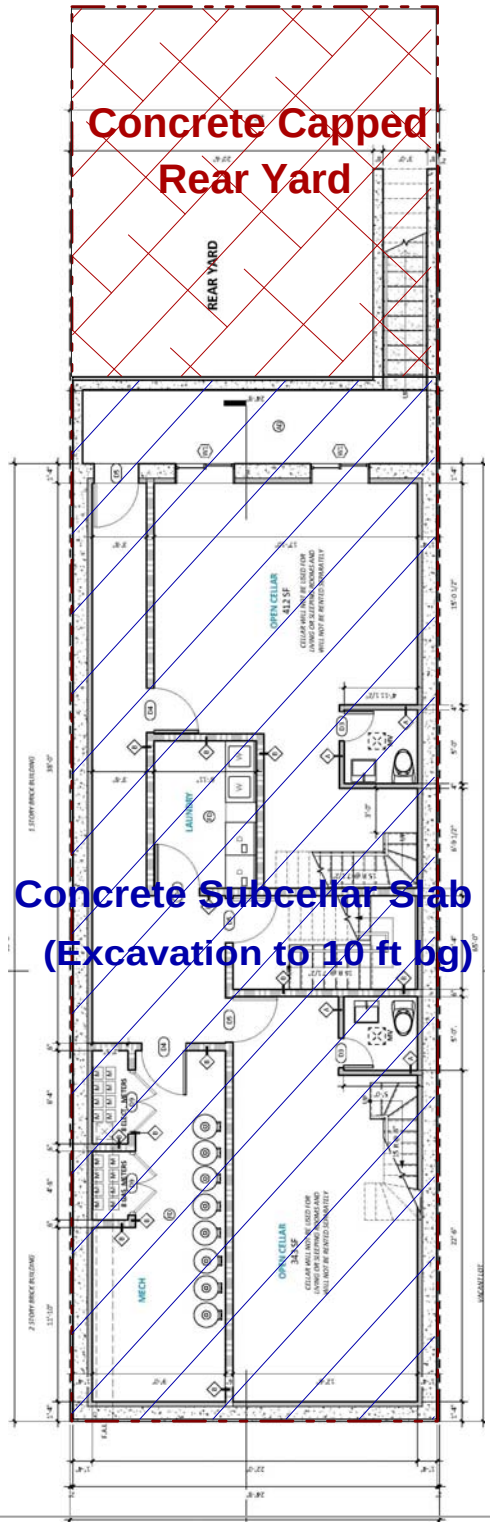
Source: http://www.oasisnyc.net/map.aspx

FIGURE 4
SURROUNDING LAND USE MAP

77 CLAY STREET, BROOKLYN NY 11222
HAZARDOUS MATERIALS REMEDIAL INVESTIGATION REPORT

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1808 MIDDLE COUNTRY ROAD, RIDGE, NEW YORK 11961
PHONE: (631) 504-6000 FAX: (631) 924-2870

CELLAR FLOOR PLAN



KEY:

Property Boundary

SCALE:

0 6.5 10 13

Scale: 1 inch = 13 feet

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Figure No. 5

Site Name: REDEVELOPMENT PROJECT
Site Address: 77 CLAY STREET, BROOKLYN, NY
Drawing Title: EXCAVATION AND CAPPING PLAN

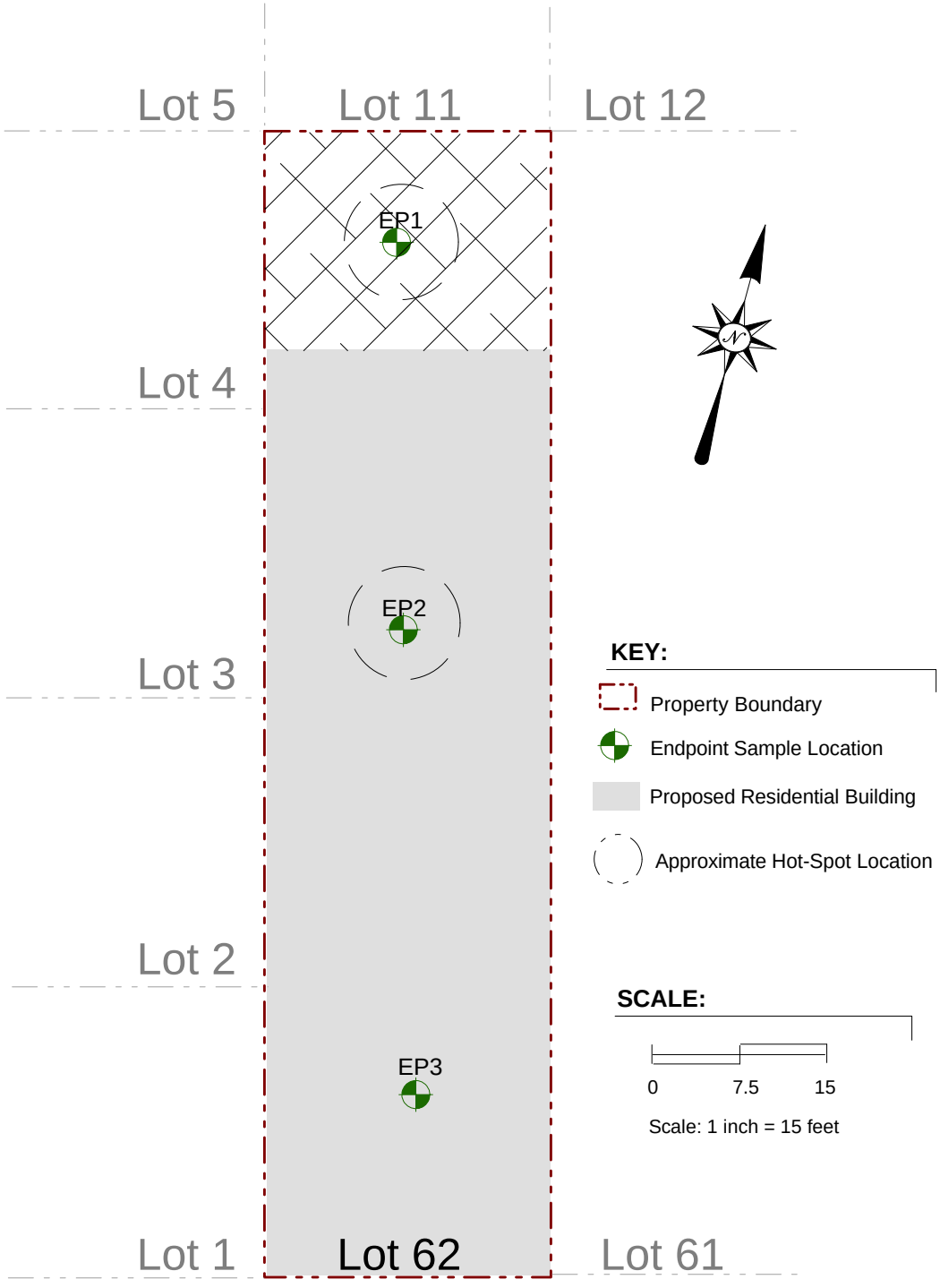

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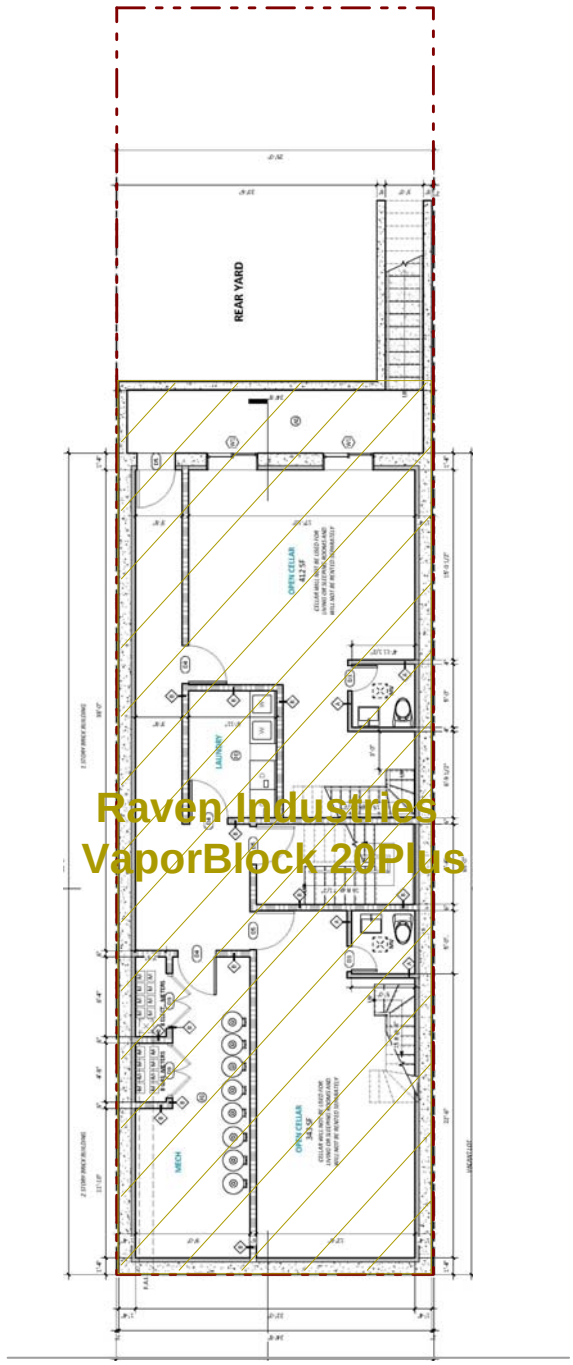
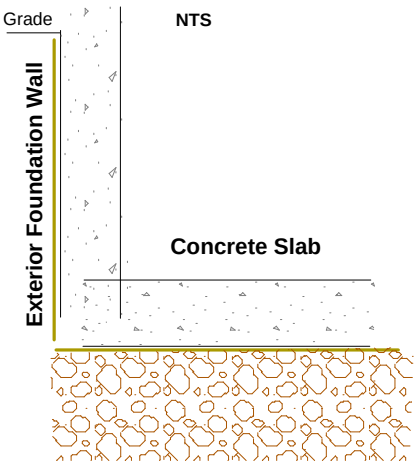
Figure No. 6

Site Name: Redevelopment Project
Site Address: 77 Clay Street, Brooklyn, NY
Drawing Title: Endpoint Sampling Plan



Detail A



Detail B

KEY:

Property Boundary

VaporBlock 20Plus

SCALE:

0 7.5 15

Scale: 1 inch = 15 feet

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Figure No. 7

Site Name: Redevelopment Project

Site Address: 77 Clay Street, Brooklyn, NY

Drawing Title: Vapor Barrier Plan

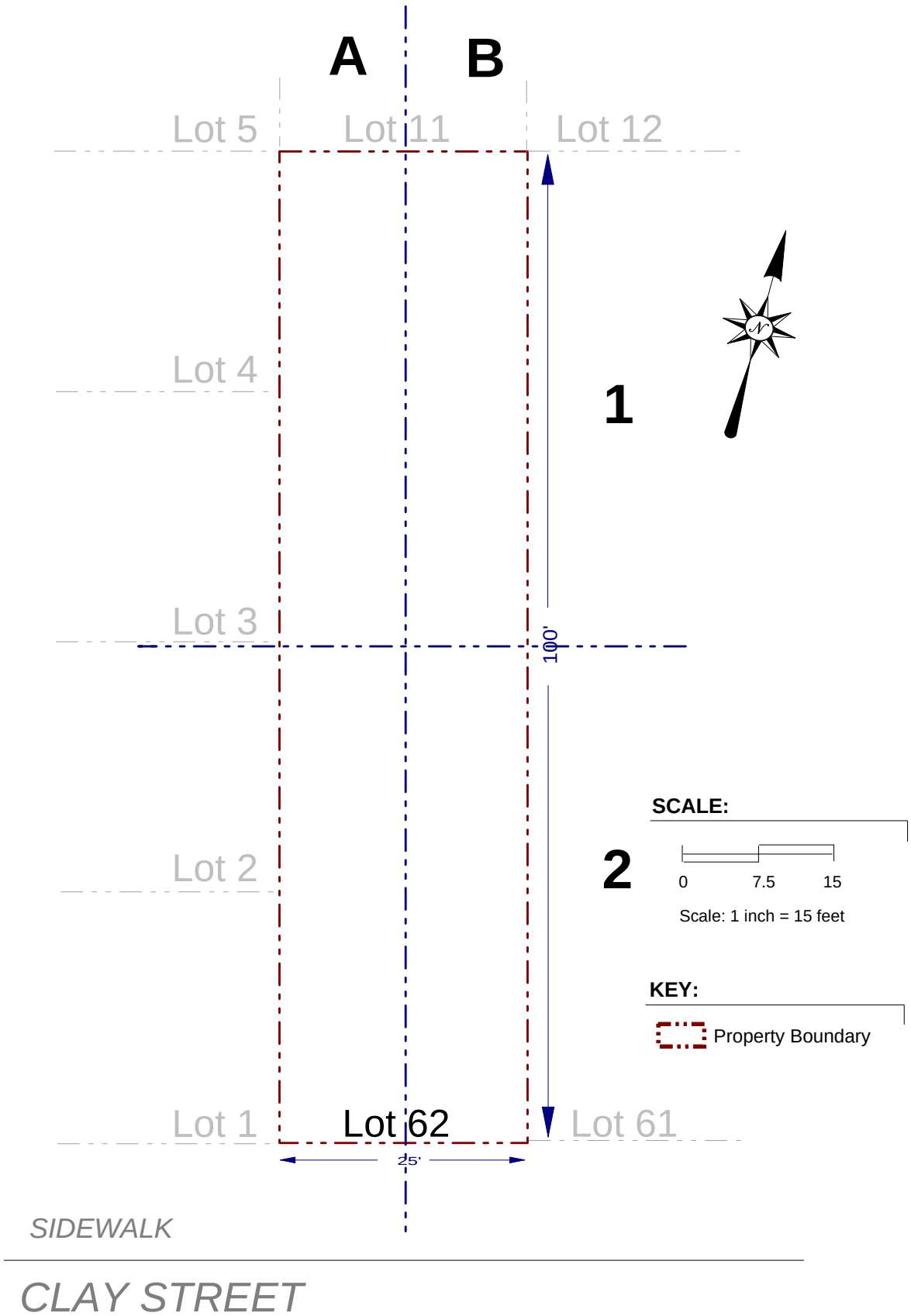

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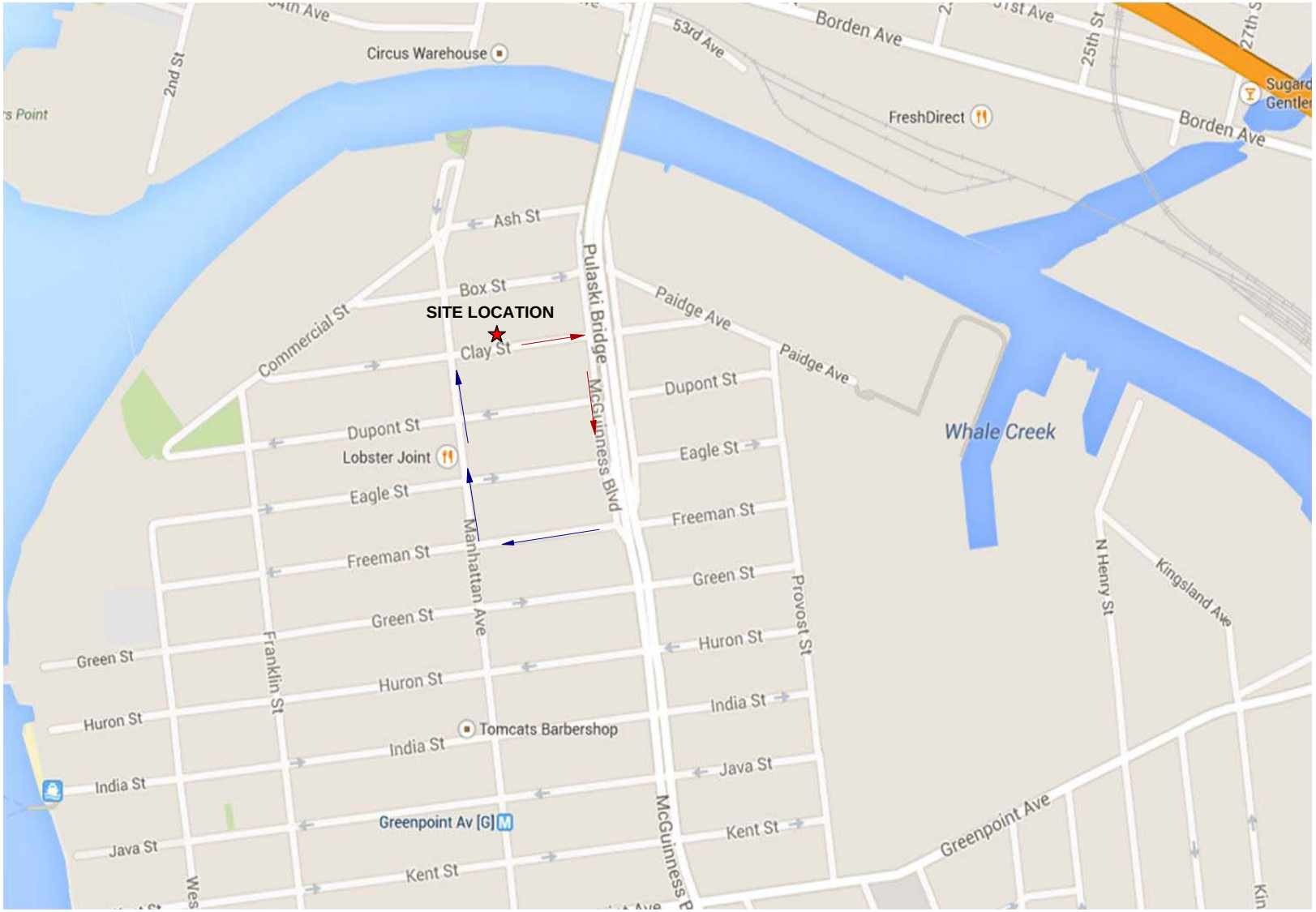
Figure No. 8

Site Name: REDEVELOPMENT PROJECT
Site Address: 77 CLAY STREET, BROOKLYN, NY
Drawing Title: ALPHA NUMERIC GRID



Key

Truck Route to the Site

Truck Route from the Site

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Figure No. 9

Site Name: REDEVELOPMENT PROJECT

Site Address: 77 CLAY STREET, BROOKLYN, NY

Drawing Title: TRUCK ROUTE MAP

ATTACHMENT A
Redevelopment Plans

77 CLAY STREET

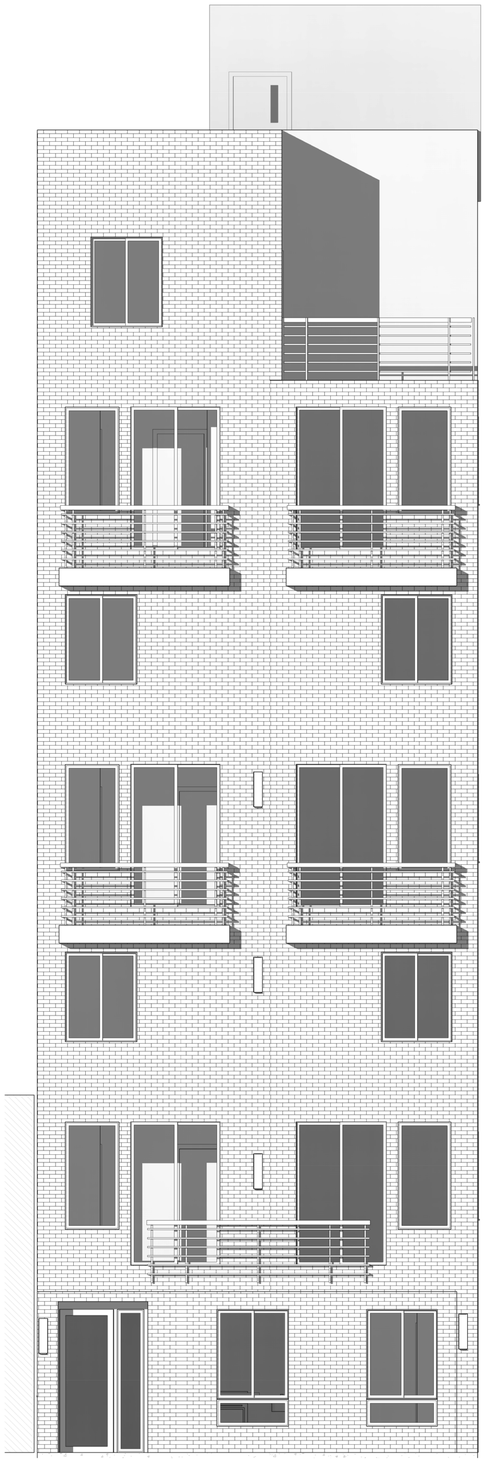
BROOKLYN NY 11222

PROPOSED 4 STORY RESIDENTIAL BUILDING

SITE INFORMATION

ADDRESS	77 CLAY STREET, BROOKLYN NY 11222
BLOCK	2483
LOT	62
ZONING DISTRICT	M1-2/R6A SPECIAL MIXED USE DISTRICT (MX-8)
ZONING MAP	13A
LOT AREA	2,500 SF
USE GROUP	2
CONSTRUCTION CLASS	1B
OCCUPANCY GROUP	R2

DRAWING LIST



DIEGO AGUILERA ARCHITECTS, P.C.
DESIGN & ARCHITECTURE

DIEGO AGUILERA ARCHITECTS P.C.
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REGO PARK NY 11374
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DBAGUILERA@AOL.COM
LICENSE #: 032873

DESIGN CONSULTANT:

SAMUEL WIEDER + ASSOCIATES
146 SPENCER STREET, SUITE #3006
BROOKLYN NY, 11205
T. 718.484.3201

STRUCTURAL ENGINEER:

MEP ENGINEER:

MUNICIPAL CONSULTANT:

OWNER:

MOSHE SILBERSTIEN
917-488-4651
SILBER175@GMAIL.COM

LOCATION:

77 CLAY STREET
BROOKLYN NY 11222

SITE MAP

PROJECT:

NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:

TITLESHEET

DOB APPLICATION # :

#.....

DOB BSCAN :

SEAL AND SIGNATURE

DATE: 8/27/2014 12:45:11 PM
SCALE:
DRAWING BY: SW
DRAWING No.:

T-100 .00

SHEET 1 OF 17

SITE INFORMATION

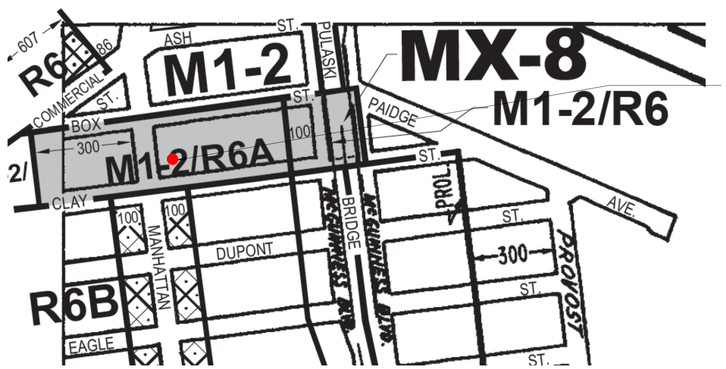
ADDRESS	77 CLAY STREET, BROOKLYN NY 11222
BLOCK	2483
LOT	62
ZONING DISTRICT	M1-2/R6A SPECIAL MIXED USE DISTRICT (MX-8)
ZONING MAP	13A
LOT AREA	2,500 SF
USE GROUP	2
CONSTRUCTION CLASS	1B
OCCUPANCY GROUP	R2

ZONING ANALYSIS

SECTION	DESCRIPTION	MAX. ALLOWED OR MIN. REQ'D	PROPOSED
ZR 123-00	USES PERMITTED AS-OF-RIGHT	USE GROUPS: 2- 17	USE GROUP: 2
ZR 123-63/ ZR ZR 23-145 / ZR 23-952	MAX. FLOOR AREA RATIO	2.7 INCLUSIONARY HOUSING BASE F.A.R.	2.7
ZR 123-63/ ZR ZR 23-145 / ZR 23-952	MAX. FLOOR AREA	6,750 SF = (2,500 X 2.7)	6,750 SF
ZR 123-63/ ZR23-145	LOT COVERAGE	65%	65%
ZR 23-22	DENSITY	6,750 / 680 =10 DWELLING UNITS	8 DWELLING UNITS
ZR 123-651	MIN. FRONT YARD	NOT REQUIRED	0'-0"
ZR 123-651	MIN. SIDE YARD	NOT REQUIRED	0'-0"
ZR 123-651	MIN. REAR YARD	30'-0	35'-0
ZR 123-662 (b)	MIN. BASE HEIGHT	40'-0"	60'-0"
ZR 123-662 (b)	MAX. BASE HEIGHT	60'-0"	60'-0"
ZR 123-662 (b)	MAX BUILDING HEIGHT	70'-0"	70'-0"
ZR 123-72 / ZR 25-23 /ZR 25-261	VEHICLE PARKING	50% OF DWELLING UNITS, WAIVED IF LESS THAN 5 PARKING	8 D.U. X 50% = 4 PARKING REQ. < 5 = 0
ZR 25-811	BICYCLE PARKING	1 PER 2 DWELLING UNITS, WAIVED IF LESS THAN 10 PARKING	8 D.U. X 50% = 4 PARKING REQ. <10 = 0
ZR 123-32	ENVIRONMENTAL CONDITIONS	WINDOWS OF ALL DWELLING UNITS SHALL BE MIN. 35dB (A)	COMPLIES
ZR 23-03/ ZR123-61/43-02	STREET TREE PLANTING	1 STREET TREE FOR EVERY 25 FEET OF STREET FRONTAGE	1 PROPOSED

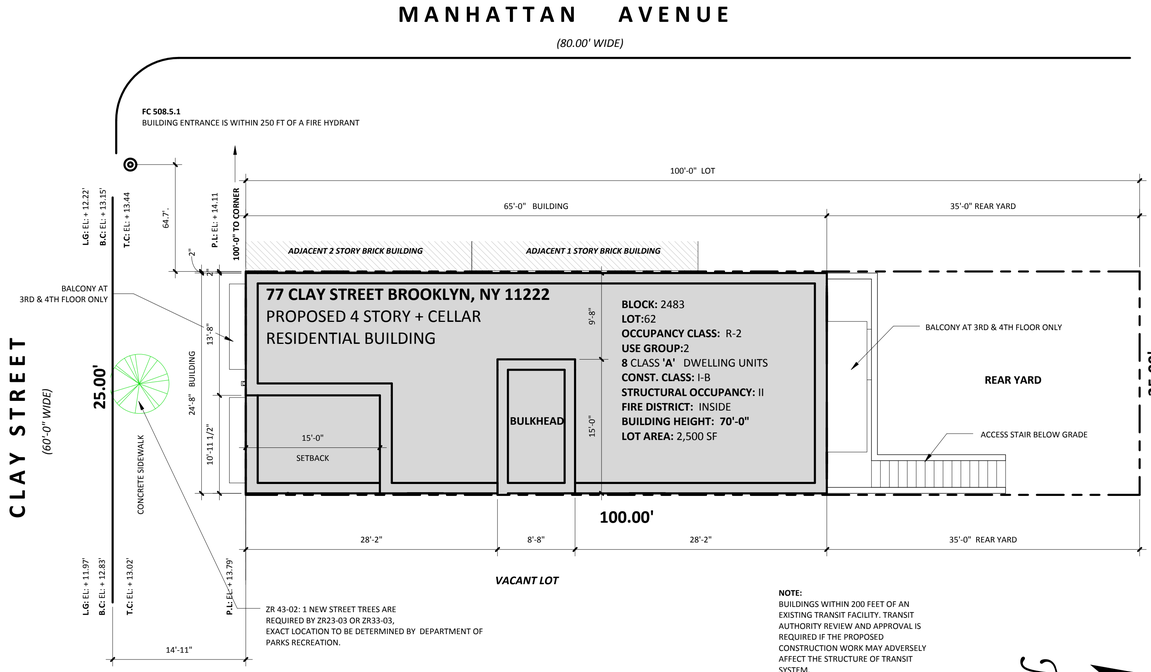
QUALITY HOUSING REGULATIONS

SECTION	DESCRIPTION	MAX. ALLOWED OR MIN. REQ'D	PROPOSED
ZR 28-21	MIN. DWELLING UNIT SIZE	400 S.F.	COMPLIES
ZR 28-22	WINDOWS	DOUBLE GLAZED	COMPLIES
ZR 28-23	REFUSE STORAGE & DISPOSAL	ENCLOSED REFUSE AREA TO BE PROVIDED AT A RATE OF 2.9 C.F. PER D.U., A MIN. OF 12 S.F.(MIN. DIM. 3 FT.) .	N/A, TOTAL # OF DWELLING UNITS IS LESS THAN 9
ZR 28-24	LAUNDRY FACILITIES	1 PER 20 DWELLING UNITS	COMPLIES
ZR 28-25	DAYLIGHT IN CORRIDORS	50% OF CORRIDOR CAN BE EXCLUDED IF DAYLIGHT IN CORRIDOR IS PROVIDED & MEETS REQ.	COMPLIES
ZR 28-31	RECREATION SPACE REQ. FOR 9 D.U. & OVER	3.3% OF FLOOR AREA	N/A, TOTAL # OF DWELLING UNITS IS LESS THAN 9
ZR 28-33	PLANTING AREAS	AREA BETWEEN THE STREET LINE AND THE STREET WALL SHALL BE PLANTED STREET WALL SHALL BE PLANTED.	N/A, EXISTING FRONT WALL LOCATED AT STREET LINE
ZR 28-41	DENSITY PER CORRIDOR	50% OF CORRIDOR AREA CAN BE EXCLUDED FROM F.A. IF LESS THAN 11 D.U.'S ARE SERVED BY THE CORRIDOR PER STORY.	COMPLIES, CORRIDOR SERVES 2 DWELLING UNITS AT 1ST FLOOR.

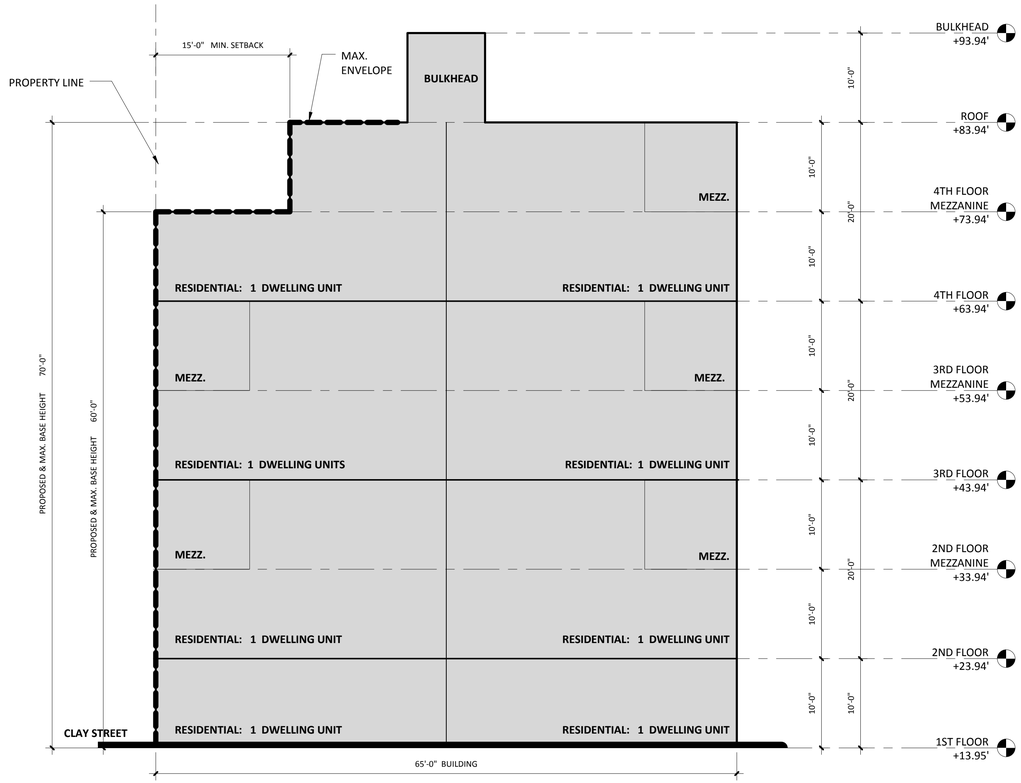


77 CLAY STREET
BLOCK: 2483
LOT: 62

4 **ZONING MAP 13B**
SCALE: 1" = 200'-0"



1 **SITE PLAN**
SCALE: 1/8" = 1'-0"



BASE PLANE CALCULATION
13.79' + 14.11' = 181.97' / 2 =13.95'

2 **HEIGHT & SETBACK DIAGRAM**
SCALE: 1/8" = 1'-0"

DIEGO AGUILERA ARCHITECTS, P.C.
DESIGN & ARCHITECTURE

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BROOKLYN NY, 11205
T. 718.484.3201

STRUCTURAL ENGINEER:

MEP ENGINEER:

MUNICIPAL CONSULTANT:

OWNER:
MOSHE SILBERSTIEN
917-488-4651
SILBER175@GMAIL.COM

LOCATION:
77 CLAY STREET
BROOKLYN NY 11222

SITE MAP

PROJECT:
NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:
ZONING ANALYSIS

DOB APPLICATION # :
#.....

DOB BSCAN :

SEAL AND SIGNATURE

DATE: 8/27/2014 12:45:13 PM
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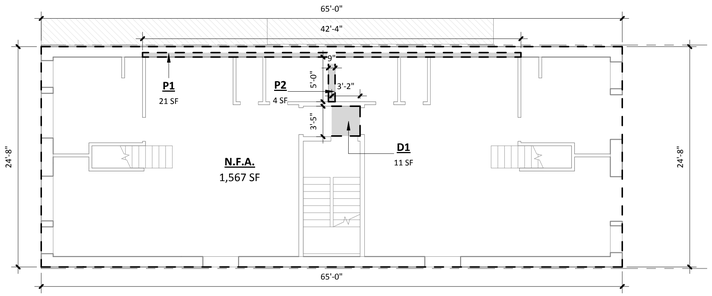
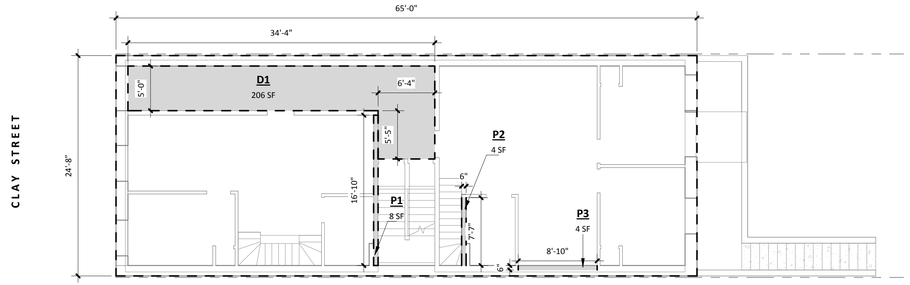


2ND & 3RD FLOOR - GROSS FLOOR AREA		
A	24'-8" X 65'-0"	1,603 SF

2ND - 3RD FLOOR AREA DEDUCTIONS (TYP)			
D1	DENSITY	3'-2" X 3'-4"	11 SF
P1	PIPE CHASE	39'-8" X 0'-4"	21 SF
P2	PIPE CHASE	5'-0" X 0'-9"	4 SF
TOTAL			35 SF

6 2ND - 3RD FLOOR AREA PLAN

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

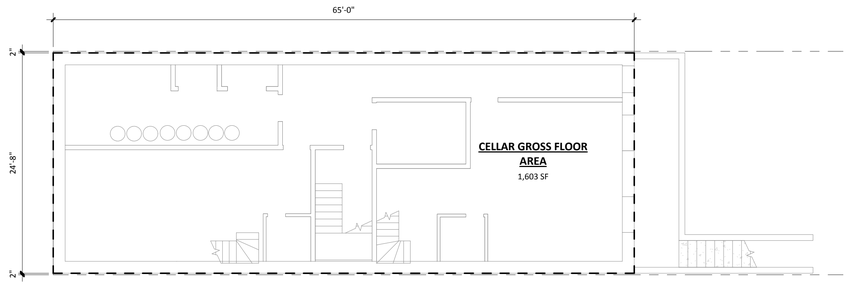


1ST FLOOR - GROSS FLOOR AREA		
A	24'-8" X 65'-0"	1,603 SF

1ST FLOOR AREA DEDUCTIONS			
D1	DAYLIGHT & DENSITY	(34'-4" X5'-0") + 5'-5" X 6'-4"	206 SF
P1	PIPE CHASE	16'-10 X 0'-6"	8 SF
P2	PIPE CHASE	7'-7" X 0'-6"	4 SF
P3	PIPE CHASE	8'-10" X 0'-6"	4 SF
TOTAL			222 SF

1 1ST FLOOR AREA PLAN

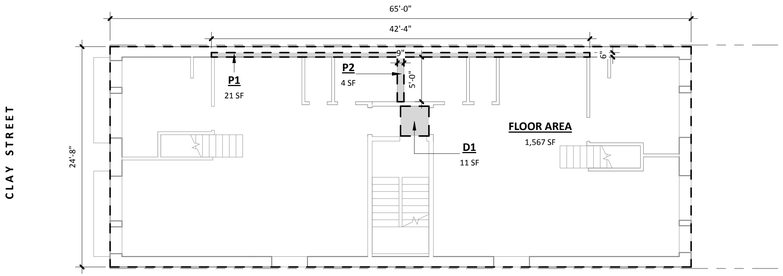
SCALE: 1/8" = 1'-0"



CELLAR - GROSS FLOOR AREA		
A	24'-8" X 65'-0"	1,603 SF

4 CELLAR FLOOR AREA PLAN

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

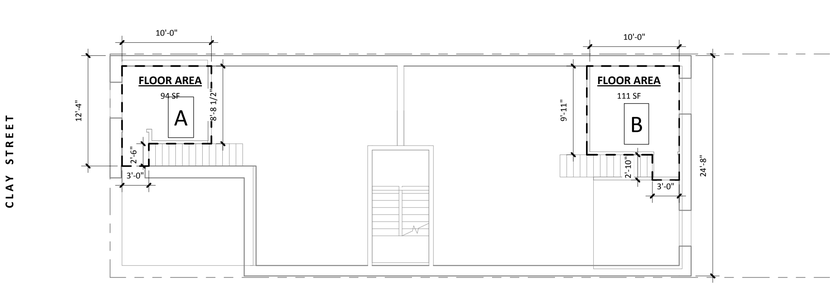


4TH FLOOR - GROSS FLOOR AREA		
A	24'-8" X 65'-0"	1,603 SF
		1,603 SF

4TH FLOOR AREA DEDUCTIONS			
D1	LIGHT & DENSITY	3'-2" X 3'-4"	11 SF
P1	PIPE CHASE	11'-7 1/2" X 0'-4"	21 SF
P2	PIPE CHASE	5'-0" X 0'-9"	4 SF
TOTAL			35 SF

2 4TH FLOOR AREA PLAN

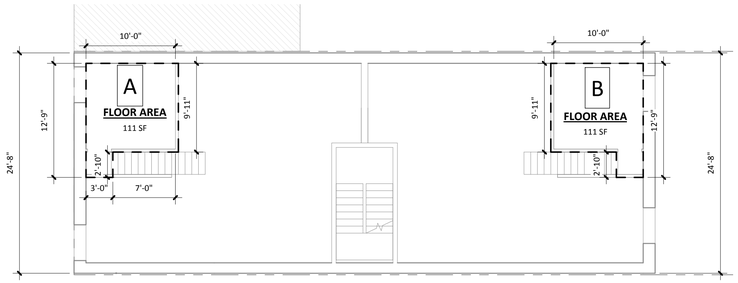
SCALE: 1/8" = 1'-0"



4TH FLOOR MEZZANINE - GROSS FLOOR AREA		
A	(9'-7" X 8'-8") + (9'-7" X 12'-4")	94 SF
B	(10'-0" X 9'-11") +(3'-0" X 2'-10")	111 SF
Grand total: 2		205 SF

5 4TH FLOOR MEZZANINE

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



2ND & 3RD FLOOR MEZZANINE - GROSS FLOOR...		
A	(10'-0" X 9'-11") +(3'-0" X 2'-10")	111 SF
B	(10'-0" X 9'-11") +(3'-0" X 2'-10")	111 SF
Grand total: 2		222 SF

3 2ND- 3RD FLOOR MEZZANINE

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

FLOOR AREA SCHEDULE			
LEVEL	GFA	DEDUCTIONS	NFA
CELLAR	1,603 SF	1,603 SF	0 SF
1ST FLOOR	1,603 SF	222 SF	1,381 SF
2ND FLOOR	1,603 SF	35 SF	1,568 SF
2ND FLOOR MEZZANINE	222 SF	0 SF	222 SF
3RD FLOOR	1,603 SF	35 SF	1,568 SF
3RD FLOOR MEZZANINE	222 SF	0 SF	222 SF
4TH FLOOR	1,603 SF	35 SF	1,568 SF
4TH FLOOR MEZZANINE	205 SF	0 SF	205 SF
TOTAL	8,662 SF		6,732 SF < 6,750 SF OK

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OWNER:

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77 CLAY STREET
BROOKLYN NY 11222

SITE MAP

PROJECT:

NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:

ZONING FLOOR AREA PLANS

DOB APPLICATION # :

#.....

DOB BSCAN :

SEAL AND SIGNATURE

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1 INCLUSIONARY HOUSING MAP

SCALE: 1" = 200'-0"

3 NYC TAX MAP

SCALE: 12" = 1'-0"

JOB NUMBER: B2483-62

SYMBOLS AND ABBREVIATIONS

FENCES — C.L.FENCE — METAL FENCE — WOOD FENCE
UTILITY POLE — U.P. — GUY WIRE — U.P.
CATCH BASIN — C.B. WITH INLET — C.B.
PARKING METER — P.M.
TRAFFIC LIGHT — T.L. — WITH STREET LIGHT
LIGHT
STREET LIGHT
FIRE HYDRANT — HYD. — HYD.
SIAMESE CONNECTION
SHUT OFF VALVE — G.V. — G.V. — W.V. — W.V.
HANDICAPPED PARKING
EXISTING TREE — TREE GROUP — Ø12"
DRAINS — DR. — DR.
TRAFFIC SIGN — T.S.
CURB AND CURB CUT — CURB CUT
OVERHEAD SERVICE — O.H.S.W.
CABLE TV MANHOLE — C.TV.
MANHOLES — G E T W S — RIM EL. INV.EL.

CITY MONUMENT
CUT CROSS
SET NAIL
SET STAKE
SET MARK (PAINTED)
SET BENCHMARK
F.E. — FIRE ESCAPE
PL or PLTF. — PLATFORM
C.E. — CELLAR ENTRANCE
A.W. — AIR WAY
CONC. — CONCRETE
PVMT. — PAVEMENT
AC — AIR CONDITION
MET. — METAL
N — NORTH OF PROPERTY LINE
S — SOUTH OF PROPERTY LINE
E — EAST OF PROPERTY LINE
W — WEST OF PROPERTY LINE

OFFSETS AND/OR DIMENSIONS SHOWN BETWEEN THE STRUCTURES AND PROPERTY LINES ARE FOR SPECIFIC PURPOSE AND USE AND THEREFORE ARE NOT INTENDED TO GUIDE ERECTION OF FENCES, RETAINING WALLS, POOLS, PLANTING AREAS, ADDITIONS TO STRU- CTURES, SHEDS, GARAGES AND ANY OTHER CONSTRUCTION.
ELEVATIONS IF ANY REFER TO NAVD 1988 DATUM

GENERAL NOTES

SUBSURFACE UTILITIES ARE NOT GUARANTEED BY SURVEYOR. HIGH CAUTION RECOMMENDED AND VERIFICATION WITH PROPER CITY AGENCIES, IS MANDATORY BEFORE COMMENCING ALL NEW WORK.

ALL SUBSURFACE AND OVERHEAD UTILITIES (AS TO SIZE , TYPE AND DEPTH) SHOWN ON THIS SURVEY ARE TAKEN FROM RECORDS OF GOVERNMENTAL AGENCIES AND UTILITY COMPANIES, UNLESS OTHERWISE NOTED AND SHOWN.

COVER OR DEPTH OF UTILITIES WHICH DERIVED FROM FIELD MEASURMENTS SHOWN ON THIS SURVEY SHOULD BE VERIFIED WITH PROPER AGENCY PRIOR TO CONSTRUCTION OF PROJECT. INVERT ELEVATIONS ARE DERIVED FROM CITY AGENCY RECORDS WHEN NOT AVAILABLE BY FIELD SURVEY AND NOTED AS "PER RECORD" ON THE SURVEY.

ALL SUBSURFACE UTILITY AS TO LOCATION AND DEPTH, SHOULD BE RECHECKED AND LEGAL GRADES SHOULD BE VERIFIED WITH THE TOPOGRAPHICAL BUREAU, PREFERABLY IN WRITING BEFORE COMMENCING CONSTRUCTION.

THIS IS TO CERTIFY THAT THERE ARE NO STREAMS OR NATURAL WATER COURSES ON THE SURVEYED PROPERTY EXCEPT AS SHOWN AND/OR DESCRIBED ON THIS SURVEY.

ALL OPERATIONS OF UNDERGROUND FACILITIES AND ALL EXCAVATORS ARE OBLIGATED TO COMPLY WITH ARTICLE 36 OF THE GENERAL BUSINESS LAW AND WITH PROVISIONS OF INDUSTRIAL CODE PART (RULE NO.38) BEFORE ANY EXCAVATION OR DEMOLITION IS COMMENCED. EVERY EXCAVATOR IS REQUIRED BY THESE LAWS TO GIVE ADVANCE NOTICE TO EVERY OPERATOR OF UNDERGROUND FACILITIES OF HIS INTENT TO PERFORM EXCAVATION OR DEMO- LITION WORK IN THE SPECIFIED AREA

ALL ELEVATIONS SHOWN REFER TO NAVD 88 DATUM.

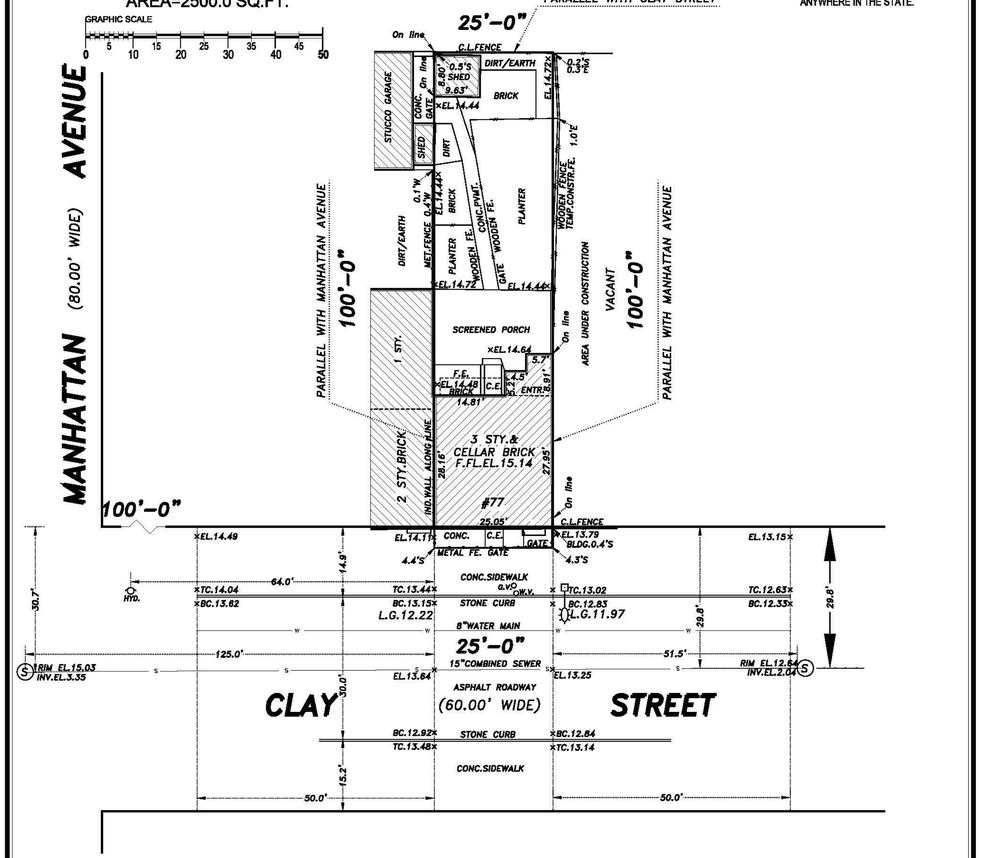
GENERAL NOTES

THE NEW YORK STATE REQUIRES NOTIFICATION BY EXCAVATORS, DESIGNERS OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN THE STATE.

1"=20'

AREA=2500.0 SQ.FT.

GRAPHIC SCALE 0 5 10 15 20 25 30 35 40 45 50



2 ARCHITECTURAL SURVEY

SCALE: 12" = 1'-0"

kaBA surveying
phone:718-354-7279 718-470-2358
fax:718-247-5854 718-470-2264
338 JERICHO TURNPIKE, FLORAL PARK, NY 11001
SURVEYS@KABAPLS.COM

SURVEYED & GUARANTEED FOR:
DEPARTMENT OF BUILDINGS

BOROUGH: KINGS
TOWN: BROOKLYN
BLOCK: 2483 SECTION:
LOT: 62
SURVEYED:
JUNE 27, 2014-ARCHITECTURAL SURVEY

UNAUTHORIZED ALTERATION OR ADDITION TO THIS SURVEY IS A VIOLATION OF SECTION 7209 OF THE NEW YORK STATE EDUCATION LAW. COPIES OF THIS SURVEY MAP NOT BEARING THE LAND SURVEYOR'S INKED SEAL OR EMBOSSED SEAL SHALL NOT BE CONSIDERED TO BE A VALID COPY. GUARANTEES OR CERTIFICATIONS INDICATED HEREON SHALL RUN ONLY TO THE PERSON FOR WHOM THE SURVEY IS PREPARED AND ON HIS BEHALF TO THE TITLE COMPANY, GOVERNMENTAL AGENCY AND LENDING INSTITUTION LISTED HEREON, AND TO THE ASSIGNEES OF THE LENDING INSTITUTION. GUARANTEES OR CERTIFICATIONS ARE NOT TRANSFERRABLE TO ADDITIONAL INSTITUTIONS OR SUBSEQUENT OWNERS.

DIEGO AGUILERA ARCHITECTS, P.C. — DESIGN & ARCHITECTURE

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OWNER:
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LOCATION:
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SITE MAP

PROJECT:
NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:
ZONING MAPS & SURVEY

DOB APPLICATION # :
#.....

DOB BSCAN :

SEAL AND SIGNATURE

DATE: 8/27/2014 12:45:19 PM
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DRAWING No.:
Z-102 .00

CODE ANALYSIS

ITEM	REQUIREMENT
BC CHAPTER 3 USE & OCCUPANCY CLASSIFICATION	GROUP: USE: R-2 RESIDENTIAL
BC CHAPTER 5 GENERAL HEIGHTS & LIMITATIONS	**TABLE 503** **ALLOWABLE HEIGHT AND BUILDING AREAS[a]** **Height limitations shown as stories and feet above grade plane.** **Area limitations as determined by the definition of "Area, building," per floor.** TYPE OF CONSTRUCTION TYPE I: A, B — TYPE II: A, B — TYPE III: A, B — TYPE IV: HT — TYPE V: A, B GROUP — Hgt (feet) Hgt(S) — UL — 160[b] — 65 — 55 — 65 — 55 — 65 — 50 — 40 R-2 — S — A — UL — UL — UL — 6 — UL — NP — 6 — 24,000 — 3 — 5,600 — 6 — 20,500 — NP — NP — NP — NP For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m[2]. UL = Unlimited, NP = Not permitted. Not permitted in Fire District Not permitted in Fire District without sprinklers a. See the following sections for general exceptions to Table 503: 1. Section 504.2, Allowable height increase due to automatic sprinkler system installation. 2. Section 506.2, Allowable area increase due to frontage. 3. Section 506.3, Allowable area increase due to automatic sprinkler system installation. 4. Section 507, Unlimited area building. b. For open parking structures, see Section 406.3. c. For private garages, see Section 406.1. d. See Section 415.5 for limitations. e. Except for Occupancy Groups F-1, H-1 through H-5, I-2, I-3, S-1 and U, buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 shall be unlimited in height. **BC 504.2 HEIGHT MODIFICATIONS** WHERE A BUILDING IS EQUIPPED THROUGHOUT WITH AN APPROVED AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1, THE VALUE SPECIFIED IN TABLE 503 FOR MAXIMUM HEIGHT IS INCREASED BY 20 FEET AND THE MAXIMUM NUMBER OF STORIES IS INCREASED BY ONE STORY
BC CHAPTER 6 TYPES OF CONSTRUCTION	**TABLE 601 FIRE - RESISTANCE RATING REQUIREMENT FOR BUILDING ELEMENTS** BUILDING ELEMENTS — TYPE IB STRUCTURAL FRAME - INCLUDING COLUMNS,GIRDER & TRUSSES — 2 BEARING WALLS -EXTERIOR — 2 BEARING WALLS -INTERIOR — 2 NON-BEARING WALLS AND PARTITIONS - EXTERIOR NON-BEARING WALLS AND PARTITIONS - INTERIOR — 0 FLOOR CONSTRUCTION - INCLUDING SUPPORTING BEAMS AND JOISTS — 2 ROOF CONSTRUCTION - INCLUDING SUPPORTING BEAMS AND JOISTS — 1 **TABLE 602 - FIRE RESISTANCE RATING REQUIREMENT FOR EXTERIOR WALL BASED ON FIRE SEPARATION DISTANCE** FIRE SEPARATION — TYPE OF CONSTRUCTION — OCCUPANCY GROUP A, B, E, F-2. I, R, S-2,U < 5 — ALL — 1 > 5 TO < 10 — IA — 1 OTHER — 1 > 10 TO < 30 — IA, IB — 1 IIB, VB — 0 OTHER — 1 > 30 — ALL — 0
BC CHAPTER 10 MEAN OF EGRESS	BC1014.2.1 MIN. DISTANCE BETWEEN TWO EXITS **R-2 OCCUPANCIES.** IN GROUP‡ R-2 OCCUPANCIES, WHERE STAIRS ARE ENCLOSED IN WALLS HAVING AT LEAST A 2-HOUR FIRE-RESISTANCE RATING AND CONSTRUCTED OF MASONRY OR MASONRY EQUIVALENT IN ACCORDANCE WITH DEPARTMENT RULES: 3.1. THE EXIT DOORS TO SUCH STAIRS SHALL BE PLACED A DISTANCE APART EQUAL TO NO LESS THAN 15 FEET
BC CHAPTER 10 MEAN OF EGRESS	BC 1023 EXIT DISCHARGE IN BUILDINGS IN OCCUPANCY GROUP R-2, UP TO 100 PERCENT OF THE NUMBER AND CAPACITY OF THE EXIT ENCLOSURES IS PERMITTED TO EGRESS THROUGH A PROTECTED AREA ON THE LEVEL OF DISCHARGE.
BC CHAPTER 11 ACCESIBILITY	BC 1107.2.4 ALL OPERABLE WINDOWS IN ROOM OR SPACES IN TYPE B DWELLING UNIT OR SLEEPING UNIT SHALL HAVE OPERABLE PARTS COMPLYING WITH SECTION 309(OPERABLE PARTS) OF ICC A117.1

NOTE:
ENTIRE BUILDING TO BE FULLY SRPINKLED.

ITEMS TO BE FILED SEPARATELY	
BPP APPLICATION	- TO BE FILED UNDER SEPARATE APPLICATION
SEWER CONNECTION SD 1 & 2	- TO BE FILED UNDER SEPARATE APPLICATION
SPRINKLERS	- TO BE FILED UNDER SEPARATE APPLICATION
STRUCTURAL	- TO BE FILED UNDER SEPARATE APPLICATION
FOUNDATION	- TO BE FILED UNDER SEPARATE APPLICATION
BOILER	- TO BE FILED UNDER SEPARATE APPLICATION
FIRE ALARM	- TO BE FILED UNDER SEPARATE APPLICATION
FENCE SHED	- TO BE FILED UNDER SEPARATE APPLICATION

ITEM	REQUIREMENT
BC CHAPTER 12 INTERIOR ENVIRONMENT	NATURAL VENTILATION REQUIREMENTS AS PER BC 1203. NATURAL LIGHT AND VENTILATION HAS TO BE PROVIDED THROUGH LEGAL WINDOW. MAXIMUM DEPTH OF A ROOM IS 30 FEET FROM OUTER FACE OF THE WINDOW.
BC CHAPTER 12 INTERIOR ENVIRONMENT	**BC1207.2** ROOM CONTAINING HVAC UNITS ON EACH FLOOR HAS TO COMPLY WITH BC 1207.2. MINIMUM SOUND TRANSMISSION CLASS (STC) FOR AIR-BORN NOISE OF NOT LESS THAN 50. TYP.
MDL NOTES	COMPLY WITH THE FOLLOWING SECTIONS OF THE MDL: · MDL33- KITCHEN WALL-ONE HOUR RATED · MDL35- PROVIDE AT LEAST 5 SQUARE OF GLAZED SURFACE ENTRANCE HALL DOOR. · MDL51A-PEEPHOLES MDL57-MAIL BOXES
BC 2113. 1.6 ADJOINING CHIMNEYS AND VENTS.	ADJOINING CHIMNEYS AND VENTS SHALL BE IN ACCORDANCE WITH SECTIONS 2113.1.6.1 TO 2113.1.6.8. BC 2113.1.6.1 RESPONSIBILITY OF OWNER OF TALLER BUILDING. WHENEVER A BUILDING IS ERECTED, ENLARGED, OR INCREASED IN HEIGHT SO THAT ANY PORTION OF SUCH BUILDING, EXCEPT CHIMNEYS OR VENTS, EXTENDS HIGHER THAN THE TOP OF **ANY PREVIOUSLY CONSTRUCTED CHIMNEYS OR VENTS WITHIN 100 FEET** (30 480 MM), THE OWNER OF SUCH NEW OR ALTERED BUILDING SHALL HAVE THE RESPONSIBILITY OF ALTERING SUCH CHIMNEYS OR VENTS TO MAKE THEM CONFORM WITH THE REQUIREMENTS OF THIS CHAPTER. BC 2113.1.6.5 REFUSAL OF CONSENT. IF CONSENT IS NOT GRANTED BY THE OWNER OF THE PREVIOUSLY CONSTRUCTED BUILDING TO DO THE ALTERATION WORK REQUIRED BY THIS SECTION, SUCH OWNER SHALL SIGNIFY HIS OR HER REFUSAL IN WRITING TO THE OWNER OF THE NEW OR ALTERED BUILDING AND TO THE COMMISSIONER; AND THE OWNER OF THE NEW OR ALTERED BUILDING HAVING SUBMITTED PLANS THAT CONFORM TO THE REQUIREMENTS OF THIS SECTION, SHALL THEREUPON BE RELEASED FROM ANY RESPONSIBILITY FOR THE PROPER OPERATION OF THE EQUIPMENT DUE TO LOSS OF DRAFT AND FOR ANY HEALTH HAZARD OR NUISANCE THAT MAY OCCUR AS A RESULT OF THE NEW OR ALTERED BUILDING.
WIND LOADS AND EARTHQUAKE LOADS	1.27-569. WIND LOADS AND EARTHQUAKE LOADS, (A) WIND LOADS. THE STRUCTURAL FRAME AND EXTERIOR COMPONENTS OF ALL BUILDINGS, SIGNS, TANKS AND OTHER EXPOSED CONSTRUCTIONS SHALL BE DESIGNED TO RESIST THE PRESSURES DUE TO WIND AS PRESCRIBED IN REFERENCE STANDARD RS 9-5. WIND SHALL BE ASSUMED TO ACT FROM ANY DIRECTION. FOR CONTINUOUS FRAMING, THE EFFECTS OF PARTIAL LOADING CONDITIONS SHALL BE CONSIDERED. (B) EARTHQUAKE LOADS. EVERY BUILDING, STRUCTURE AND PORTION THEREOF SHALL, AT A MINIMUM, BE DESIGNED AND CONSTRUCTED TO RESIST THE EFFECTS OF SEISMIC GROUND MOTIONS AS PRESCRIBED IN REFERENCE STANDARD RS 9-6. 2. UBC - UNIFORM BUILDING CODE SECTION 2312-1990. THE FOLLOWING TYPES OF CONSTRUCTION SHALL, AT A MINIMUM BE DESIGNED AND CONSTRUCTED TO RESIST THE EFFECTS OF SEISMIC GROUND MOTIONS AS PROVIDED IN THIS SECTION: NEW STRUCTURES ON NEW FOUNDATIONS; NEW STRUCTURES ON EXISTING FOUNDATIONS; AND ENLARGEMENTS IN AND OF THEMSELVES ON NEW FOUNDATIONS. BUILDINGS CLASSIFIED IN NEW YORK CITY OCCUPANCY GROUP J-3 ACID NOT MORE THAUL THREE STORIES IN HEIGHT NEED NOT CONFORM TO THE PROVISIONS OF THIS SECTION. 3. B. LIQUEFACTION. (I) SOILS OF CLASSES 7-65,8-65,10-65 AND NON-COHESIVE CLASS 11-65 BELOW THE GROUND WATER TABLE AND LESS THAN FIFTY FEET BELOW THE GROUND SURFACE SHALL BE CONSIDERED TO HAVE POTENTIAL FOR LIQUEFACTION. 4. FOUNDATION PLATES AND SILLS. FOUNDATION PLATES OR SELLS SHALL BE BOLTED TO THE FOUNDATION OR FOUNDATION WALL WITH NOT LESS THAN ONE-HALF INCH NOMINAL DIAMETER STEEL BOLTS EMBEDDED AT LEAST SEVEN INCHES INTO THE CONCRETE OF MASONRY RUED SPACED NOT MORE THAN SIX FEET APART. THERE SHALL BE A MINIMUM OF TWO BOLTS PER PIECE WITH ONE BOLT LOCATED WITHIN TWELVE INCHES OF EACH END OF EACH PIECE, A PROPERLY SIZED NUT AND WASHER SHALL BE TIGHTENED ON EACH BOLT TO THE PLATE. 5. FOUNDATION INTERCONNECTION OF PILE CAPS AND CAISSONS. INDIVIDUAL PILE CAPS AND CAISSONS OF EVERY STRUCTURE SUBJECTED TO SEISMIC FORCES SHALL BE INTERCONNECTED BY TIES. SUCH TIES SHALL BE CAPABLE OF RESISTING, IN TENSION OR COMPRESSION, A MINIMUM HORIZONTAL FORCE EQUAL TO THE PRODUCT OF (ZV4) AND THE LARGER VERTICAL LOAD AT THE END OF EACH TIE.

SAFETY NOTES
PROTECTION OF ADJACENT PROPERTY (BC 3309)

1. THIS WORK WILL BE PERFORMED IN COMPLETE COMPLIANCE WITH FEDERAL OSHA STANDARDS THE ADMINISTRATIVE CODE OF THE CITY OF NEW YORK, DEP REGULATIONS REGARDING DISPOSAL OF SOIL, THE NEW YORK CITY FIRE, AND THOSE OF ALL OTHER AGENCIES HAVING JURISDICTION OVER THIS PROJECT.

2. SAFEGUARDS DURING CONSTRUCTION OR DEMOLITION:
THE PROVISIONS OF CHAPTER 33 OF THE 2008 NYC BUILDING CODE SHALL GOVERN THE CONDUCT OF ALL CONSTRUCTION OR DEMOLITION OPERATIONS WITH REGARD TO THE SAFETY OF THE PUBLIC & PROPERTY. FOR REGULATIONS RELATING TO THE SAFETY OF PERSONS EMPLOYED IN CONSTRUCTION OR DEMOLITION OPERATIONS, OSHA STANDARDS SHALL APPLY & IN CONFORMANCE WITH THE NEW YORK CITY FIRE.

3. RESPONSIBILITY FOR SAFETY (BC 3301.1.1)
AS PER THIS chapter 33, "NOTHING IN THIS CHAPTER SHALL BE CONSTRUED TO RELIEVE PERSON ENGAGED IN CONSTRUCTION OR DEMOLITION OPERATIONS FROM *COMPLYING WITH OTHER APPUCABLE PROVISIONS OF LAW,* NOR IS IT INTENDED TO ALTER
OR DIMINISH ANY OBLIGATION OTHERWISE IMPOSED BY LAW ON THE OWNER, CONSTRUCTION MANAGER, GENERAL CONTRACTOR, CONTRACTORS, MATERIAL MEN, REGISTERED DESIGN PROFESSIONALS, OR OTHER PARTY INVOLVED IN A CONSTRUCTION OR DEMOLITION PROJECT TO ENGAGE IN SOUND DESIGN & ENGINEERING, SAFE CONSTRUCTION OR DEMOLITION PRACTICES, INCLUDING BUT NOT LIMIT TO DEBRIS REMOVAL, & TO ACT IN A REASONABLE & RESPONSIBLE MANNER TO MAINTAIN A SAFE CONSTRUCTION OR DEMOLITION SITE."

4. CONTRACTORS: (BC 3301.2)
CONTRACTORS, CONSTRUCTION MANAGERS, & SUBCONTRACTORS ENGAGED IN BUILDING WORK SHALL INSTITUTE AND MAINTAIN SAFETY MEASURES & PROVIDE ALL EQUIPMENT OR TEMPORARY CONSTRUCTION NECESSARY TO SAFEGUARD ALL PERSONS & PROPERTY AFFECTED BY SUCH CONTRACTOR'S OPERATIONS.

5. SAFETY IN EXCAVATIONS: (BC 3304)
NOTIFICATION OF DEPARTMENT (BC3304.3.1)
Via Phone or Electronically, by the Permit Holder.
- NOTIFICATION TO DOB REQUIRED AT LEAST 24 HOURS IN ADVANCE, BUT NO MORE THAN 48 HOURS PRIOR TO COMMENCEMENT OF EARTHWORK OPERATIONS.
EXECPTIONS:
-HAND EXCAVATION 5 FEET OR LESS, & 2 FEET OR MORE FROM AN EXISTING FOOTING, AND NOT IN A BASEMENT OR CELLAR THAT ADJOIN AN EXISTING FOUNDATION.
- GEOTECHNICAL TEST PITS 1 0 FEET OR LESS IN PLAN
- BURIAL IN CEMETERIES .
- HPD EMERGENCY WORK NOTIFICATION OF ADJACENT BUILDING OWNERS (3304.3.2)

by writing.
. NOTIFICATION TO ADJACENT BUILDINGS OWNERS ARE REQUIRED NOT LESS THAN 10 DAYS IN ADVANCE OF CERTAIN EARTHWORK
OPERATIONS:
- EXCAVATIONS BETWEEN 5 FEET & 10 FEET DEEP, & WITHIN 10 FEET OF AN ADJACENT BUILDINGS
. NOTIFICATION MUST PROVIDE:
- DESCRIPTION OF WORK.
- TIMEFRAME & SCHEDULE.
- CONTACT INFORMATION OF PERSON CAUSING EXCAVATION & DOB.

EACH SUBCONTRACTOR SHALL PROVIDE ALL NECESSARY PROTECTION OF EXCAVATION SITES.

PROTECTION OF EXCAVATION SITES (BC 3304.4)
PROTECTION OF SIDES OF EXCAVATION:
EXCAVATIONS 5 FEET OR GREATER IN DEPTH REQUIRE PROTECTION METHODS, INCLUDING:
-SHORING
-BRACING
-SHEETING
-SHEETING PILING

SPECIAL INSPECTION REQUIRED WHEN PROTECTION METHODS EMPLOYED.
-ALTERNATIVE: SLOPE SIDE OF EXCAVATION PER SOILS REPORT WITH DOB APPROVAL.

6. PROTECTION OF ADJOINING PROPERTY (3309.4 NYC BC)
. RESPONSIBILITY FOR PROTECTION:
-THE PERSON CAUSING THE EXCAVATION OR FILL IS RESPONSIBLE TO PROTECT ADJOINING PROPERTIES, REGARDLESS OF DEPTH.
-IF THE ADJOINING PROPERTY OWNER REFUSES ACCESS TO PERSON CAUSING EXCAVATION, ADJACENT PROPERTY OWNER IS RESPONSIBLE FOR PROTECTION AND CAN BE ISSUED VIOLATIONS FOR FAILING TO DO SO.

PROTECTION REQUIRED (BC 3309.1)
"ADJOINING PUBLIC AND PRIVATE PROPERTY SHALL BE PROTECTED FROM DAMAGE DURING CONSTRUCTION OR DEMOLITION WORK. PROTECTION MUST BE PROVIDED FOR FOOTINGS, FOUNDATIONS, PARTY WALL, CHIMNEYS, SKYLIGHTS AND ROOFS. PROVISIONS SHALL BE MADE TO CONTROL WATER RUN-OFF AND EROSION DURING CONSTRUCTION OR DEMOLITION ACTIVITIES."

PHYSICAL EXAMINATION OF ADJOINING PROPERTIES IS REQUIRED: (BC 3309.3):
- PRIOR TO COMMENCEMENT OF WORK
- DURING THE PROGRESS OF WORK CONDITIONS OBSERVED ARE REQUIRED TO BE DOCUMENTED & MADE AVAILABLE TO DOB UPON REQUEST.

PRE-CONSTRUCTION SURVEY (BC 3309.4):
PRE-CONSTRUCTION SURVEYS OF ADJOINING PROPERTIES ARE REQUIRED TO BE SUBMITTED TO DOB PRIOR TO COMMENCEMENT FOR :
-EXCAVATIONS BETWEEN 5 & 10 FEET DEEP WITHIN 10 FEET OF AN ADJACENT BUILDING.
-ALL EXCAVATION> 10 FEET DEEP.
ENHANCED DEMOLITION REQUIREMENTS
Categories:
- FULL DEMOLITION: THE DISMANTLING. RAZING. OR REMOVAL OF ALL OF A BUILDING OR STRUCTURE, & ALL OPERATIONS INCIDENTAL THERETO.
-PARTIAL DEMOLITION: THE DISMANTLING, RAZING, OR REMOVAL OF STRUCTURAL MEMBERS, FLOORS, INTERIOR BEARING WALLS, AND/OR EXTERIOR WALLS OR PORTIONS THEREOF, INCLUDING ALL OPERATIONS INCIDENTAL THERETO.

THE DEMOLITION SAFETY REQUIREMENTS APPLY WHENEVER ANY DEMOLITION OPERATIONS ARE BEING PERFORMED, REGARDLESS OF THE PERMIT TYPE ISSUED.

DEMOLITION NOTIFICATION
-DEPARTMENT NOTIFICATION
-AT LEAST 24 HOURS IN ADVANCE, BUT NOT MORE THAN 48 HOURS PRIOR TO COMMENCING EITHER FULL OR PARTIAL DEMOLITION OPERATIONS.

DEMOLITION NOTIFICATION
-DEPARTMENT NOTIFICATION
-AT LEAST 24 HOURS IN ADVANCE, BUT NOT MORE THAN 48 HOURS PRIOR TO COMMENCING EITHER FULL OR PARTIAL DEMOLITION OPERATIONS.

ADJACENT PROPERTY OWNERS
-WRITTEN NOTICE AT LEAST 10 DAYS IN ADVANCE OF FULL OR PARTIAL DEMOLITION OPERATIONS.
-EXCEPTION: PARTIAL INTERIOR DEMOLITION OPERATIONS, WHERE ONLY HAND-HELD MECHANICAL DEMOLITION EQUIPMENT IS USED. MECHANICAL DEMOLITION THE USE OF MECHANICAL DEMOLITION EQUIPMENT, OTHER THAN HAND-HELD EQUIPMENT, IN FULL AND PARTIAL DEMOLITION OPERATIONS.
- CONSTRUCTION DOCUMENTS SHALL BE FILED BY A REGISTERED PROFESSIONAL ENGINEER.
- MECHANICAL PARTIAL & FULL DEMOLITION WITHIN THE BUILDING ARE SUBJECT TO SPECIAL INSPECTION.

INCLUDED IN THIS AGREEMENT IS THE RESPONSIBILITY OF THIS CONTRACTOR IN THE OBSERVANCE OF RELEVANT PROVISIONS OF THE FOLLOWING:
A. FEDERAL OSHA REGULATIONS.
B. NEW YORK CITY BUILDING DEPARTMENT AND CODE REGULATIONS.
C. ENVIRONMENTAL PROTECTION AGENCY REGULATIONS.
D. ANSI-A10.5-1975 SAFETY REQUIREMENTS FOR MATERIAL HOISTS.
E. A 10.6-1969AMERICAN NATIONAL STANDARD SAFETY REQUIREMENTS FOR DEMOLITION.
F. A 10.10-1970 SAFETY REQUIREMENTS FOR TEMPORARY AND PORTABLE SPACEHEATING DEVICES AND EQUIPMENT USED IN THE CONSTRUCTION INDUSTRY.
G. Z 49.2 STANDARD FOR SAFEGUARDING BUILDING CONSTRUCTION AND DEMOLITION OPERATIONS.

THIS CONTRACTOR SHALL INSTALL, MAINTAIN AND SUBSEQUENTLY REMOVE ALL SCAFFOLDING AS REQUIRED. SCAFFOLDING SHALL CONFORM TO ALL APPLICABLE OSHA AND NEW YORK CITY BUILDING DEPARTMENT REGULATIONS. ALL COSTS FOR SCAFFOLDING ARE INCLUDED IN THE CONTRACT AMOUNT.

CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL DEBRIS GENERATED BY THE OPERATION IN A SAFE AND LEGAL MANNER.

THE CONTRACTOR SHALL BE RESPONSIBLE, AT NO ADDITIONAL COST FOR PROVISION, UPKEEP, MAINTENANCE AND SUBSEQUENT REMOVAL OF THE FOLLOWING TEMPORARY FACILITIES:
A. TOILETS FOR PERSONNEL.
B. BARRIERS AND RAILINGS ON-SITE AND WITHIN THE BUILDING FOR SAFETY OF PERSONNEL.
C. ALL SUCH PROTECTION AND TEMPORARY FACILITIES MENTIONED ABOVE SHALL MEET OSHA AND/OR NEW YORK CITY REGULATIONS.

7. PROVIDE FOR CONSTRUCTION OF A JOB FENCE, EIGHT (8) FEET TALL, WITH TOP AND BOTTOM RAILS. INSTALL A GATE WITH HASPS AND LOCKS OF SUFFICIENT STRENGTH TO WITHSTAND CONSTANT USE WHERE SHOWN ON THE DRAWINGS AND IN LOCATION(S) AGREED UPON JOINTLY BY OWNERS' REPRESENTATIVE AND THE CONTRACTORS.

8. THIS CONTRACTOR WARRANTS THAT HE HAS INSPECTED THE SITE AND HAS CAREFULLY EXAMINED THE WORK FOR SCOPE AND DIFFICULTY OF EXECUTION, AND HAS REVIEWED THE SITE SURVEYS ATTACHED HERETO, SPECIFICATIONS AND BORING DATA.

9. THIS CONTRACTOR SHALL CLEAN AND BROOM SWEEP SIDEWALKS UPON THE COMPLETION OF EACH DAY'S WORK.

EGRESS ANALYSIS (TABLE 1005.1)

LEVEL	PERSONS PERMITTED	REQUIRED EGRESS WIDTH PER OCCUPANT			PROPOSED EGRESS WIDTH PER OCCUPANT		
		DOOR	STAIRS	CORRIDOR	DOOR	STAIR	CORRIDOR
CELLAR	7	.2"	.3"	.2"	5.14"	5.14"	5.14"
1ST FLOOR	7	.2"	.3"	.2"	5.14"	5.14"	5.14"
2ND FLOOR	7	.2"	.3"	.2"	5.14"	5.14"	5.14"
3RD FLOOR	7	.2"	.3"	.2"	5.14"	5.14"	5.14"
4TH FLOOR	9	.2"	.3"	.2"	4"	4"	4"

DIEGO AGUILERA ARCHITECTS, P.C.
DESIGN & ARCHITECTURE
DIEGO AGUILERA ARCHITECTS P.C.
97-40 62ND DRIVE. SUITE 4L
REGO PARK NY 11374
(718) 606 6008 - (718) 896 9432
DBAGUILERA@AOL.COM
LICENSE #: 032873

DESIGN CONSULTANT:
SAMUEL WIEDER + ASSOCIATES
146 SPENCER STREET, SUITE #3006
BROOKLYN NY, 11205
T. 718.484.3201

STRUCTURAL ENGINEER:

MEP ENGINEER:

MUNICIPAL CONSULTANT:

OWNER:
MOSHE SILBERSTIEN
917-488-4651
SILBER175@GMAIL.COM

LOCATION:
77 CLAY STREET
BROOKLYN NY 11222

SITE MAP

PROJECT:
NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:
CODE ANALYSIS

DOB APPLICATION # :
#.....

DOB BSCAN :

SEAL AND SIGNATURE

DATE: 8/27/2014 12:45:20 PM
SCALE:
DRAWING BY: SW
DRAWING No.:
Z-103 .00
SHEET 7 OF 17

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NEW YORK CITY BUILDING CONSTRUCTION CODE. ALL WORK SHALL ALSO CONFORM TO THE REQUIREMENTS OF ANY OTHER AUTHORITIES HAVING JURISDICTION.

2. ALL CONSTRUCTION WORK TO BE DONE BY A LICENSED CONTRACTOR AND AN APPLICATION FOR PERMIT SHALL BE FILED WITH , AND PERMIT ISSUED FROM, THE NYC DEPT. OF BUILDINGS BOROUGH OFFICE IN WHICH THE PROPOSED WORK IS LOCATED.

3. ALL PLANS REQUIRED BY THE BUILDING DEPARTMENT AND OTHER CITY AGENCIES FOR THESE PREMISES ARE SUBJECT TO REVIEW, COMMENTS AND/OR APPROVAL OF THE BUILDING DEPARTMENT, AND NO CONSTRUCTION SHALL COMMENCE UNTIL SO APPROVED, AND PERMIT HAS BEEN OBTAINED.

4. CONTRACTOR SHALL COORDINATE THE WORK WITH ALL UTILITY COMPANIES.

5. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL REQUIRED INSURANCE, LICENSES, AND SHALL PAY FEES FOR AND OBTAIN ALL NECESSARY PERMITS REQUIRED BY ALL CITY AGENCIES.

6. ALL ELECTRICAL WORK TO BE DONE BY A LICENSED ELECTRICIAN AND APPLICATION FOR PERMIT TO BE FILED WITH, AND PERMIT ISSUED, FROM THE BUREAU OF ELECTRICAL CONTROL LOCATED AT 60 HUDSON ST., NEW YORK, NY.

7. ALL PLUMBING WORK TO BE DONE BY A LICENSED PLUMBER AND AN APPLICATION FOR PERMIT SHALL BE FILED WITH, AND PERMIT ISSUED FROM, THE BOROUGH OFFICE THE NYC DEPT. OF BUILDINGS.

8. ALL MECHANICAL WORK TO BE DONE BY A LICENSED CONTRACTOR AND AN APPLICATION FOR PERMIT SHALL BE FILED WITH, AND PERMIT ISSUED FROM, THE BOROUGH OFFICE THE NYC DEPT. OF BUILDINGS.

9. THE LICENSED PROFESSIONAL ARCHTIECT SERVICES AND RESPONSIBILITIES AS A DESIGN APPLICANT ARE LIMITED TO THE PREPARATION OF PLANS, BUILDING DEPARTMENT FILINGS TO OBTAIN APPROVAL.IT IS THE RESPONSIBILITY OF OWNER/ CONTRACTOR TO RETAIN AND HAVE ON SITE A NYC CERTIFIED PE OR RA AS THE SPECIAL/PROGRESS INSPECTOR.

10. CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS, NOTES, WORK, ETC. AT THE JOB SITE BEFORE THE WORK IS STARTED, REPORT ANY AND ALL DISCREPANCIES TO THE ARCHITECT-REFER TO WRITTEN DIMENSIONS ONLY.

11. THE CONTRACTOR FOR THIS PROJECT HAS BEEN SELECTED FOR HIS SPECIAL KNOWLEDGE IN THIS TYPE OF CONSTRUCTION. DRAWINGS HAVE BEEN PREPARED AS A DIAGRAMMATIC GUIDELINE AND FOR COMPLIANCE WITH APPLICABLE CODES. ANY DISCREPANCIES, DEVIATIONS, OR ADVERSE CONDITIONS OBSERVED AT THE SITE SHALL BE REPORTED TO THE ARCHITECT IMMEDIATELY IN WRITING.

12. WHEN THE DRAWINGS AND NOTES DO NOT COVER PARTICULAR ITEMS, THE SUBCONTRACTOR SHALL ASK THE GENERAL CONTRACTOR FOR THE METHOD AND INTENT OF PERFORMING THE WORK. IN THE ABSENCE OF INQUIRIES, IT WILL BE ASSUMED THAT THE SUBCONTRACTOR HAS INCLUDED A CONTINGENCY FACTOR FOR ALL NECESSARY ITEMS TO PROVIDE A COMPLETE SYSTEM AND IN STRICT ACCORDANCE WITH ALL CODE REQUIREMENTS.

13. DO NOT SCALE DRAWINGS-REFER TO WRITTEN DIMENSION ONLY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ON-SITE CONDITIONS PRIOR TO COMMENCING WORK. CONTRACTOR SHALL NOTIFY ARCHITECT IN WRITHING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

14. CONTRACTOR SHALL PROVIDE ALL PROTECTION MEASURES NECESSARY FOR THE SAFETY OF THE PUBLIC AND WORKMEN AT THE JOB SITE DURING THE COURSE OF THE WORK.

15. CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING HIS BEST SKILLS AND ATTENTION. HE SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK. THE ARCHITECT OF RECORD IS NOT RESPONSIBLE FOR THE SUPERVISION.

16. CONTRACTOR SHALL MAKE NO DEVIATIONS FROM DESIGN DRAWINGS WITHOUT THE WRITTEN APPROVAL OF THE ARCHITECT.

17. GENERAL CONTRACTOR TO PROVIDE A 2-HOUR RATED WATER RESISTANT ENCLOSURE FOR THE EXISTING BUSDUCTS THROUGHOUT THE ENTIRE VERTICAL AND HORIZONTAL RUN WITH-IN THE AREA OF WORK

18. IT IS THE INTENTION OF THESE DRAWINGS AND NOTES TO PROVIDE FOR THE COMPLETE CONSTRUCTION OF THE WORKS. SHOULD ANYTHING BE OMITTED FROM THE DRAWINGS NECESSARY FOR THE PROPER CONSTRUCTION OF WORK HEREIN DESCRIBED, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE RA.

19. THE RA MAY IN HIS ABSOLUTE DISCRETION ISSUE FURTHER DRAWINGS, DETAILS AND/OR WRITTEN INSTRUCTIONS, DIRECTION AND EXPLANATIONS IN REGARD TO:
(A) THE VARIATION OF THE DESIGN OR THE OMISSION OR SUBSTITUTION OF ANY WORK.
(B) THE OPENING UP FOR INSPECTION OF ANY WORK COVERED UP.
(C) THE AMENDING AND CORRECTING OF ANY DEFECTS OR OTHER FAULTS DUE TO MATERIAL AND WORKMANSHIP NOT IN ACCORDANCE WITH THIS CONTRACT ARE MADE BY THE CONTRACTOR AT HIS OWN COST.

SAFETY OF PUBLIC AND PROPERTY NOTES

1. PROVIDE ALL EQUIPMENT AND TEMPORARY CONSTRUCTION NECESSARY TO SAFEGUARD ALL PERSONS AND PROPERTY.

2. PERSONS SUPERINTENDING THE WORK SHALL INSPECT ALL DEVICES FOR ADEQUATE SAFETY.

3. DETERMINE LOCATION, PROJECT AND SAFEGUARD ALL UTILITIES ON AND ADJACENT TO THE SITE. NOTIFY UTILITY COMPANIES AFFECTED BY THE WORK AT LEAST 72 HOURS BEFORE COMMENCEMENT OF WORK.

4. PROVIDE FIRE FIGHTING EQUIPMENT AS REQUIRED BY THE FIRE DEPARTMENT.

5. ALL MACHINERY, TOOLS, SERVICE LINES, SHALL BE GUARDED, SHIELDED, OR BARRICADED TO PROVE SAFETY TO THE PUBLIC.

6. AREAS USED BY PUBLIC SHALL BE MAINTAINED FREE FROM ICE, SNOW, GREASE, DEBRIS, EQUIPMENT, MATERIALS, ETC.

7. WASTE MATERIALS OR DEBRIS SHALL BE DISPOSED FROM THE SITE.

8. NO MATERIALS OR DEBRIS SHALL BE DISPOSED OF OR THROWN OUTSIDE THE EXTERIOR OF THE WALLS OF THE BUILDING, ON SIDEWALKS, COURTS, YARDS OR SCAFFOLDING. NO WASTE MATERIAL IS TO BE STORED ON SCAFFOLDING, SIDEWALK SHEDS, SIDEWALK BRIDGES AND PUBLIC AREAS.

9. CONTRACTOR SHALL FURNISH AND OBTAIN ALL PERMITS REQUIRED TO MAINTAIN ALL EQUIP. SUCH AS TEMP. STAIRS, LADDERS, RAMPS, SCAFFOLDS, HOISTS, RUNWAYS DERRICKS, CHUTES, ETC. AS REQ..

SMOKE DETECTOR & CARBON MONOXIDE NOTES

1.SMOKE/ CARBON MONOXIDE DETECTORS OR DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH THE HOUSINg MAINTENANCE CODE,MULTIPLE DWELLING LAW,THE NYC BUILDING CODE AND NYC ELECTRICAL CODE.

2.SMOKE AND CARBON MONOXIDE DETECTORS MAY BE COMBINED PROVIDING THE DEVICES COMPLY WITH THE PROVISIONS OF THE ADMINISTRATIVE CODE OF THE CITY OF NEW YORK AND ANY APPLICABLE RULES PROMULGATED THEREUNDER.

3.EACH SMOKE/ CARBON MONOXIDE DETECTOR SHALL BE INSTALLED OUTSIDE OF EACH SLEEPING ROOM IN THE IMMEDIATE VICINITY OR WITHIN 15' OF THE ENTRANCE TO A SLEEPING ROOM.

4.EACH SMOKE/ CARBON MONOXIDE DETECTOR SHALL BE OF A TYPE THAT ALLOWS FOR READILY TESTING OF SUCH DEVICE.

5.DUPLEX UNITS SHALL HAVE A DEVICE LOCATED ON EACH LEVEL IF ONLY ONE MEANS OF EGRESS II PROVIDED

6. CEILING MOUNTED DEVICES SHALL BE A MINIMUM DISTANCE OF 4" FROM ANY WALL OR AT LOCATIONS AND HEIGHTS RECOMMENDED BY THE MANUFACTURER.

7.WALL MOUNTED DEVICE SHALL BE A MINIMUM OF 4" TO A MAXIMUM OF 12" FROM THE CEILING OR AT LOCATIONS AND HEIGHTS RECOMMENDED BY THE MANUFACTURER.

8 SUCH SMOKE/ CARBON MONOXIDE DETECTOR MUST BE EITHER THE IONIZATION OR PHOTOELECTRIC TYPE AS PER NYC BUILDING CODE

9. A CERTIFICATE OF SATISFACTORY INSTALLATION FOR SMOKE/CARBON MONOXIDE DETECTORS MUST BE FILED WITH THE DIVISION OF CODE ENFORCEMENT, TEN (10) DAYS AFTER INSTALLATION.

10.TO ENSURE PROPER OPERATION, DO NOT INSTALL CO DETECTORS NEXT TO BATHROOMS, WHICH ARE SOURCES OF HUMIDITY, OR NEAR GAS STOVES, GAS DRYERS, ETC. DETECTORS SHOULD NOT BE PLACED IN AREAS LIKELY TO BE DAMAGED BY CHILDREN OR PETS.

FIRE PROTECTION CONSTRUCTION REQUIREMENTS

1. ALL MATERIALS OR ASSEMBLIES REQUIRED TO HAVE A FIRE RESISTANCE RATING SHALL COMPLY WITH THE FOLLOWING:
A) IT SHALL CONFORM WITH NFPA "FIRE RESISTANCE RATING".
B) IT SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ASTM E-199, "STANDARD METHODS OF FIRE TESTED OF BUILDING CONSTRUCTION AND MATERIALS" AND ACCEPTED BY THE COMMISSIONER, OR
C) IT SHALL HAVE BEEN ACCEPTABLE PRIOR TO THE EFFECTIVE DATE OF THE CODE.

2. OPENING PROTECTIVES INCLUDING FRAMES, SELF-CLOSING DEVICES AND HARDWARE SHALL COMPLY WITH ASTM E-108, "STANDARD METHODS OF FIRE TEST OF DOORS ASSEMBLIES" AND ASTM E-163.

3. ROOF SHALL BE COVERED WITH CLASS A OR B COVERING MEETING THE REQUIREMENTS OF ASTM E-108 "STANDARD METHODS OF FIRE TEST OF ROOF COVERINGS", OR REFERENCE STANDARD RS 5-9 "ROOF COVERING CLASSIFICATIONS".

4. FIRESTOPPING: CONCEALED SPACES WITHIN PARTITIONS, WALLS, FLOORS, ROOFS, STAIRS, FURRING, PIPE SPACES: WITH 2" NOMINAL THICKNESS WOOD OR 1/2" EXTERIOR TYPE PLYWOOD, NON-COMBUSTIBLE MATERIALS SHALL BE USED IN CONCEALED SPACES OF PARTY WALL DIVISION OR WHERE IN CONTACT WITH FLUES, CHIMNEYS, NON-COMBUSTIBLE FIRESTOPPING MAY BE MASONRY SET IN MORTAR CONCRETE, 3/4" MORTAR OR PLASTER ON NON-COMBUSTIBLE LATH. PLASTERBOARD AT LEAST 3/8" THICK, SHEET METAL AT LEAST .002" THICK, SOLID WEE METAL STRUCTURAL MEMBERS, 1/4" MINIMUM MINERAL COMPOSITE BOARD OR EQUIVALENT MATERIALS, MINERAL, SLAB OR ROCKWOOL WHEN COMPACTED INTO CONFINED SPACE.

5. INTERIOR FINISH: MATERIALS SHALL BE CLASSIFIED IN ACCORDANCE WITH THE SURFACE FLAME-SPREAD RATING OBTAINED AS PERSCRIBED IN ASTM E-84 "STANDARD METHOD OF TEST FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS." INTERIOR FINISH SHALL BE GROUPED INTO THE CLASSES OF THESE SCHEDULES:

INTERIOR FINISH CLASS - FLAME SPREAD
CLASS - (A) 0 - 25
CLASS - (B) 26 - 75
CLASS - (C) 76 - 225
CLASS - (D) OVER 225

INTERIOR FINISH, EXCEPT FINISH FLOORING AND FLOOR COVERING, WALL COVERINGS AND COATINGS LESS THAN .036" IN TOTAL THICKNESS, SHALL HAVE FLAME SPREAD RATING NOT GREATER THAN THAT LISTED IN TABLE 5-4 OF CODE.

PARTITION NOTES

1. DEFLECTION FOR ALL PARTITIONS SHALL NOT EXCEED 1/240TH OF THE SPAN MAXIMUM FOR TYPICAL GYPSUM PARTITIONS, OR 1/360 FOR WOOD-CLAD PARTITIONS, OR STONE-CLAD PARTITION SYSTEMS.

2. WATER RESISTANT DRYWALL (FOR THE FULL HEIGHT OF THE PARTITION CONSTRUCTION) SHALL BE USED IN TOILETS, SHOWERS, SERVICE ROOMS, ETC. USE STANDARD GYPSUM BOARD FOR CEILING CONSTRUCTION.

3. PENETRATIONS: COORDINATE WITH MECHANICAL CONTRACTOR FOR OPENINGS REQUIRED FOR RETURN AIR IN FULL HEIGHT PARTITIONS.

4. PROVIDE LATERAL BRACING TO STRUCTURE ABOVE FINISHED CEILINGS FOR PARTITIONS EXCEEDING UNSUPPORTED HEIGHTS INDICATED ON DRAWINGS.

5. PROVIDE HORIZONTAL CONTROL JOINTS AT 12'-0' O.C. IN THE VERTICAL DIRECTION UNLESS NOTED OTHERWISE.

6. PROVIDE CONTROL JOINTS IN GYPSUM WALLBOARD CONSTRUCTION SUCH THAT PARTITION OR FURRING RUNS DO NOT EXCEED 30', AND
CEILING DIMENSIONS DO NOT EXCEED 50' IN EITHER DIRECTION WITH PERIMETER RELIEF OR 30' WITHOUT PERIMETER RELIEF.

7. PROVIDE VERTICAL CONTROL JOINTS WITH SEALANT IN MASONRY WALLS AS SHOWN IN DRAWINGS WITH MAXIMUM SPACING OF 25'-0'.

8. COMPLETELY SEAL WITH ACOUSTICAL SEALANT HEADS, BASES, AND ENDS, PLUS ALL PENETRATIONS(INCLUDING BUT NOT LIMITED TO MECHANICAL, ELECTRICAL, AND PLUMBING WORK).

9. PROVIDE SOUND BLANKETS AS INDICATED.

MULTIPLE DWELLING LAW AND HOUSING MAINTENANCE CODE.

PART (A)

1. PAINTING OF PUBLIC HALLWAYS AND WITHIN DWELLING TO COMPLY WITH SEC. 26-12.01 H.M.C.

2. PAINTING OF WINDOW FRAMES AND BALCONIES TO COMPLY WITH SEC. D26-03 H.M.C.

3. PROPER ELECTRIC LIGHTING EQUIPMENT WITHIN DWELLING TO BE PROVIDED AND MAINTAINED AS PER SEC. D26-19.01, D26-19.08 AND D26-19.05 H.M.C.

4. EVERY VESTIBULE, ENTRANCE AND PUBLIC HALL TO HAVE LIGHTS AS PER SEC. D26-19.05 H.M.C.

5. ONE LIGHT (100 WATTS) EACH SIDE OF ENTRANCE WAY TO BE PROVIDED AS PER SEC. 26 SUBD. 7A M.D.L., DEPT. OF W.S.G. & E., AND DEPARTMENT RULES AND REGULATIONS AND D26-19.07 H.M.C.

6. PROPER ELECTRIC LIGHTS TO BE PROVIDED NEAR ENTRANCES WAYS, YARDS AND COURTS AS PER SEC. D26-19.07 H.M.C., ON SEPARATE CIRCUIT OR CONNECTED TO HOUSE LINE SERVICING PUBLIC HALL AND IN ACCORDANCE WITH REQUIREMENTS AND APPROVAL OF THE DEPT. OF WATER SUPPLY GAS AND ELECTRICITY.

7. PREMISES TO BE MAINTAINED AND KEPT FREE OF RODENT AND INSECT INFESTATION AS PER SEC. D26-13.03 AND D26-13.05 H.M.C.

8. RECEPTACLES FOR COLLECTION OF WASTE MATTER TO BE PROVIDED AS PER SEC. D26-14.03 AND 05 H.M.C.

9. KEY LOCK IN ENTRANCE DOOR TO EACH DWELLING UNIT WITH AT LEAST ONE KEY TO BE PROVIDED BY OWNER AS PER SEC. D26-20.05 H.M.C.

10. PROVIDE HEAVY DUTY LATCH SET, DEAD BOLT, THUMB TURN INSIDE, ALSO HEAVY DUTY CHAIN DOOR GUARD FOR ALL APT. DOORS, AS PER SEC. D26-20.05.

11. BOARD OF STANDARDS & APPEALS APPROVED PEEPHOLES, APPROX. 5' ABOVE FINISHED FLOOR TO BE PROVIDED IN ENTRANCE DOORS OF DWELLING UNITS, AS PER SEC. D26-20.01 H.M.V. AND DEPT. RULES & REGULATIONS.

12. APPROVED MAIL RECEPTACLES AND DIRECTORY OF PERSONS LIVING IN DWELLING TO BE PROVIDED AS PER SEC. D26-21.01 H.M.C. AND REGULATIONS OF U.S. POSTAL SERVICE.

13. PROPER FLOOR SIGNS TO BE PROVIDED IN PUBLIC HALL NEAR STAIRS AND ELEVATOR AND WITHIN STAIR ENCLOSURE AS PER SEC. D26-21.03 H.M.C.

14. PROPER HOUSE NUMBER TO BE PROVIDED IN FRONT OF THE DWELLING AS PER SEC. 82(3)-1.0 ADMINISTRATIVE CODE, SEC. D26-21.05 H.M.C., SEC. 885 CHARTER AND RULES AND REGULATIONS OF THE BOROUGH PRESIDENT.

15. PROPER JANITORIAL SERVICES TO BE PROVIDED AS PER SEC. D-22.03 AND D26-22.05 H.M.C.

16. EVERY KITCHEN AND KITCHENETTE TO BE PROVIDED WITH A SINK HAVING MINIMUM 2" WASTE AND TRAP AS PER SEC. D26-32.01 H.M.C. CEILING TO BE 1-HOUR RATED (5/8" S/R F.C.60)

17. ALL COMBUSTIBLE MATERIALS WITHIN 1' OF COOKING APPARATUS TO BE PROPERLY FIRE RETARDED AND MINIMUM 2' CLEARANCE MAINTAINED ABOVE EXPOSED COOKING SURFACE. COMBUSTIBLE MATERIAL BETWEEN 2' AND 3' ABOVE EXPOSED COOKING SURFACE TO BE FIRE RETARDED WITH 1-HOUR S.R.F.C. 60 AND 26 GA. METAL AS PER SEC. D26-32.05 H.M.C. AND DEPARTMENT RULES & REGULATIONS. ALL GAS RANGERS TO BE A.G.A. APPROVED.

18. NO KITCHEN SHALL BE OCCUPIED FOR SLEEPING PURPOSES, AS PER SEC. D-26-33 H.M.C.

19. FLOORS OF BATHROOMS INCLUDING TOILETS ROOMS TO HAVE CERAMIC TILE FLOOR AND 6" TILE BASE W/R PLASTERBOARD FINISHED WALLS AND CEILINGS AS PER SEC. 76 M.D.L. AND SEC. D26-32.03 & 05 H.M.C.

20. VENT DUCTS TO BE ON GALV METAL, 18 GA. FOR ALL KITCHENETTES AND 24 GA. FOR ALL BATHROOMS. VERTICAL DUCTS TO HAVE RATED ENCLOSURE TO BE FIRE STOPPED WITH TWO LAYERS OF 1/2" PLASTERBOARDS BETWEEN BEAMS AND ROOF PROVIDE REGISTERS, FIRE DAMPERS (BSA APPROVED), ACCESS DOORS ETC. FANS TO BE CONTROLLED BY TIME CLOCKS. FANS FOR KITCHENETTES SHALL PROVIDE AT LEAST 6 AIR CHANGES PER HOUR (SEC. 33 M.D.L.) AND 2 CFM. PER SQ.FT. OF FLOOR AREA (C26-1207.2). BATHROOM EXHAUST FANS SHALL DELIVER AT LEAST 4 AIR CHANGES PER HOUR (SEC. 76 M.D.L.) AND 50 CFM (SEC. C26-1207.3).

21. DOORS LEADING TO BATHROOMS TO HAVE 1/2" MIN. CLEAR SPACE BETWEEN BOTTOM OF DOORS AND SADDLES.

22. ALL FIRE DAMPERS TO BE APPROVED BY THE BOARD OF STANDARD & APPEALS.

23. BUILDING TO COMPLY WITH SEC. D26-33.01 MAXIMUM OCCUPANCY AND MINIMUM ROOM AREA.

24. REGISTRATION STATEMENTS TO BE FILLED AS PER SEC. D26-41.01 AND 03 H.M.C.

25. REGISTRATION IDENTIFICATION SIGN CONTAINING DWELLING SERIAL NUMBER TO BE POSTED AS PER SEC. D26-41.15 H.M.C.

26. IDENTIFICATION OF MANAGING AGENT OR OWNER TO BE INDICATES ON TENANT'S RENT RECEIPT AS PER SEC. D26-41.17 H.M.C.

27. ENTIRE BUILDING TO COMPLY WITH LOCAL LAWS APPLICABLE AND DEPARTMENT RULES AND REGULATIONS.

28. WALLS OF COURTS AND SHAFTS TO BE LIGHT COLORED SURFACE AS PER SEC. D26-12.05 H.M.C.

29. DRAINAGE FOR ROOFS, COURTS AND YARDS TO COMPLY WITH SEC. D26-16.03 H.M.C.

30. DRAINS AND AREAWAYS, YARDS AND ROOF TO COMPLY WITH SEC. 77 M.D.L.

31. HEATING SYSTEM SUBJECT TO APPROVAL BY APPROPRIATE CITY AGENCIES AS PER SEC. D26-17.01 H.M.C.

32. BUILDING TO COMPLY WITH SEC. D26-17.01 IN REFERENCE TO HEATING AND WATER SUPPLY.

33. BUILDING TO COMPLY WITH SEC. 64 M.D.L. - GAS METERS, GAS APPLIANCES AND ARTIFICIAL LIGHTING.

34. BUILDING ENTRANCES AND OTHER EXTERIOR ENTRANCES SHALL BE EQUIPPED WITH APPROVED TYPE AUTOMATIC SELF - CLOSING AND SELF - LOCKING DOORS.

35. ENTRANCE DOORS TO EACH DWELLING UNITS SHALL HAVE DOOR BELL, CHIME OR KNOCKER.

36. BOILER ROOMS SHALL COMPLY WITH SEC. 65 M.D.L.

37. BUILDING ENTRANCE DOORS AND OTHER EXTERIOR DOORS SHALL BE PROVIDED WITH HEAVY DUTY LOCK SETS WITH AUXILIARY LATCH BOLTS TO PREVENT THE LATCH FROM BEING MANIPULATED BY OTHER THAN A KEY.

38. DOORS TO DWELLING UNITS SHALL BE EQUIPPED WITH HEAVY DUTY HINGES AND DOOR STOPS.

39. ALL OPERABLE WINDOWS SHALL BE EQUIPPED WITH SASH LOCKS DESIGNED TO BE OPERABLE FROM THE INSIDE ONLY.

40. BUILDING CLASSIFIED IN OCCUPANCY GROUP R-2 CONTAINING EIGHT OR MORE DWELLING UNITS SHALL BE PROVIDED WITH AN INTERCOMMUNICATION LOCATED AT THE DOOR GIVING ACCESS TO THE MAIN ENTRANCE HALL OR LOBBY.

PART (B)

BOILER ROOM ENCLOSURE; FILING PROCEDURE AND MINIMUM REQUIREMENTS FOR NEW BOILER ROOM ENCLOSURES FOR MULTIPLE DWELLING AS PER AMENDED SECTION 56 OF THE MULTIPLE DWELLING LAW.

1. BUILDING NOTICED APPLICATION WITH PLAN OF ENTIRE CELLAR TO BE FILED BY REGISTERED ARCHITECT, PROFESSIONAL ENGINEER OR OWNER.

2. AN APPROVED COPY OF THE PLANS ARE REQUIRED INDICATING COMPLIANCE WITH SEC. 65 OF THE MULTIPLE DWELLING LAW.

3. WALLS ENCLOSING BOILER TO BE OF FIREPROOF MATERIAL HAVING A ONE (1) HOUR FIRE RATING NOTE 4" SOLID CONC. BLOCK OR 4" STEEL STUD W/ 5/8" GWB BOTH SIDES IS GENERALLY USED.

4. CEILING OF ENTIRE BOILER ROOM REQUIRED TO BE PROPERLY FIRE RETARDED
NOTE: APPROVED METHODS OF FIRE RETARDING ARE FOLLOWING:
A) 1/2" GWB COVERED WITH 26 GAL. METAL
B) METAL LATH AND 3/4" CEMENT OR 1" GYPSUM MORTAR
C) ROCK LATH AND 3/4" GYPSUM MORTAR.

5. FLOOR OF BOILER ROOM TO BE CONCRETE CONSTRUCTION.

6. FIXED VENTILATION TO OUTER AIR FOR BOILER ROOM REQUIRED, MINIMUM AREA EQUAL TO SMOKE STACK (NORMALLY 64 SQ.IN.)
NOTE: WHERE DUCT IS REQUIRED TO PROVIDE FIXED VENTILATION, SAME MUST BE ENCLOSED IN METAL LATH AND CEMENT OR GYPSUM MORTAR, FIXED VENTILATION FOR BOILERS PERMITTED BY MEANS OF LOUVRE WITH FUSIBLE LINK DAMPER AT BOTTOM OF ENCLOSURE AND FIXED LOUVRE IN OUTSIDE WALL OF OPEN CELLAR.

7. METERS, DUMBWAITER SHAFTS, ELEVATOR SHAFTS, INTERIOR STAIRS OR REQUIRED OUTSIDE CELLAR ENTRANCES CANNOT BE LOCATED WITHIN BOILER ROOM.

8. A MINIMUM OF 18" CLEARANCE REQUIRED BETWEEN BOILER AND ENCLOSING WALLS PER RS14-15.

9. DOOR TO BOILER ROOM TO BE ONE (1) HOUR FIRE RATED SELF-CLOSING AS PER BOARD OF STANDARDS AND APPEALS APPROVAL.

10. ELECTRIC LIGHT TO BE PROVIDED WITHIN BOILER ROOM.

11. OIL BURNER REMOTE CONTROL SWITCH MUST BE LOCATED OUTSIDE BOILER ROOM.

12. NO STORAGE PERMITTED WITHIN BOILER ROOM.

13. AFTER APPROVAL OF PLANS AND APPLICATION, IT IS NECESSARY TO OBTAIN A "PERMIT TO BUILD" BEFORE ANY WORK IS STARTED.

PART (C)

ALARMS (HANDICAP COMPLIANCE PER THE REQUIREMENTS OF ANSI A117.1 OF 1986)
1. GENERAL 4.26.1 - EMERGENCY WARNING SYSTEMS SHALL INCLUDE BOTH AUDIBLE ALARMS COMPLYING WITH 4.26.2 AND VISUAL ALARMS COMPLYING WITH 4.26.3. AUXILIARY VISUAL ALARMS SHALL COMPLY WITH 4.26.4.

2. AUDIBLE ALARMS 4.26.2 - AUDIBLE EMERGENCY ALARMS SHALL PRODUCE A SOUND THAT EXCEEDS THE PREVAILING EQUIVALENT SOUND LEVEL IN THE ROOM OR SPACE BY AT LEAST 15 DECIBELS OR EXCEEDS ANY MAXIMUM SOUND LEVEL WITH A DURATION OF 30 SECONDS BY 5 DECIBELS, WHICHEVER IS LOUDER. SOUND LEVELS FOR ALARM SIGNALS SHALL NOT EXCEED 120 DECIBELS.

3. VISUAL ALARMS. 4.26.3 - VISUAL ALARMS SHALL BE FLASHING LIGHTS ARRAIGNED TO FLASH IN CONJUNCTION WITH THE AUDIBLE EMERGENCY ALARMS. THE FLASHING FREQUENCY OF VISUAL ALARMS SHALL BE APPROXIMATELY 1 HR. SPECIALIZED SYSTEM USING ADVANCED TECHNOLOGY MAY BE SUBSTITUTED IF EQUIVALENT PROTECTION IS AFFORDED HANDICAPPED USERS OF THE BUILDING OR FACILITY.

4. AUXILIARY ALARMS. 4.26.4 - SENSORY ALARMS PROVIDED FOR PERSONS WITH HEARING IMPAIRMENTS SHALL BE CONNECTED TO THE BUILDING EMERGENCY SYSTEM OR THERE SHALL BE A STANDARD 110 VOLT ELECTRICAL RECEPTACLE INTO WHICH AN ALARM UNIT CAN BE CONNECTED TO BE ACTIVATED BY THE BUILDING ALARM SYSTEM. INSTRUCTIONS FOR USE OF THE AUXILIARY ALARM OR CONNECTION SHALL BE PROVIDED.

WATERPROOFING NOTES

FOR CELLAR FOUNDATION WALLS

1. BEFORE ANY WATERPROOFING OF FOUNDATION WALLS IS APPLIED. ALL SURFACES SHALL BE DRY, CLEAN, AND FREE OF ALL LOOSE MORTAR OR ANY MATERIAL WHERE THE FOUNDATION WALL IS CONCRETE. ALL THE WIRES SHALL BE CUT AND ALL SPACES AROUND SERVICE PIPES SHALL BE SEALED.

2. THE WATERPROOFING OF A FOUNDATION SHALL BE APPLIED FROM A LEVEL AT THE BOTTOM OF THE FOOTING AT THE LEVEL OF THE FINISHED EXTERIOR GRADE. WHERE FOUNDATION WALLS ARE OF CONCRETE UP TO OR NEAR GRADE LEVEL, THE WATERPROOFING SHALL EXTEND AT LEAST 6" ABOVE FINISHED GRADE. WATERPROOFING IS TO CONSIST OF A HEAVY BRUSH COAT, TROWEL COAT OF A COMMERCIAL ASPHALT PREPARATION, OR AN APPLICATION OF HOT ROOFERS PATCH, NO BACKFILLING SHALL BE DONE UNTIL THE WATERPROOFING HAS BEEN INSPECTED AND ACCEPTED BY THE DEPARTMENTS' INSPECTOR. ONLY CLEAN EARTH SHALL BE USED FOR THE BACKFILLING. BACKFILLING IS TO BE DONE IN SUCH A MANNER, AS TO NOT DAMAGE THE WATERPROOFING, BACKFILLING IS TO BE DONE WELL TAMPED AND GRADED TO PITCH AWAY FROM THE FOUNDATION WALLS.

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BROOKLYN NY 11222

SITE MAP

PROJECT:

NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:

GENERAL NOTES

DOB APPLICATION # :

#.....

DOB BSCAN :

SEAL AND SIGNATURE

DATE: 8/27/2014 12:44:55 PM
SCALE:
DRAWING BY: SW
DRAWING No.:

G-100 .00

SPECIAL INSPECTION NOTES:

1. GENERAL (Section BC 109) EXCEPT AS OTHERWISE SPECIFICALLY PROVIDED, INSPECTIONS REQUIRED BY 2008 NYC BC OR BY DEPARTMENT DURING THE PROGRESS OF WORK MAY BE PERFORMED ON BEHALF OF THE OWNER BY APPROVED INSPECTION AGENCIES OR, IF APPLICABLE, BY SPECIAL INSPECTORS. HOWEVER, IN THE INTEREST OF PUBLIC SAFETY, THE COMMISSIONER MAY DIRECT THAT ANY OF SUCH INSPECTIONS BE PERFORMED BY THE DEPARTMENT. ALL INSPECTIONS SHALL BE PERFORMED AT THE SOLE COST AND EXPENSE OF THE OWNER.
REFER TO CHAPTER 1 OF TITLE 28 OF THE ADMINISTRATIVE CODE OF 2008 NYC BC, FOR ADDITIONAL PROVISIONS RELATING TO INSPECTIONS.

2. REQUIRED PROGRESS INSPECTIONS. (SECT. 109.3) THE INSPECTIONS SET FORTH 109.3.1 THROUGH 109.3.8 SHALL BE MADE DURING THE PROGRESS OF WORK TO VERIFY SUBSTANTIAL COMPLIANCE WITH THE CODE AND WITH APPROVED CONSTRUCTION DOCUMENTS.

3. A LOG OR OTHER DOCUMENTATION SHALL BE MAINTAINED AT THE JOB SITE INDICATING THE DATES WHEN CONTROLLED
INSPECTIONS WERE PERFORMED, THE IDENTITY OF THE INSPECTOR, AND THE SCOPE OF THE WORK WHICH WAS PERFORMED.

4. WHEN A "TR-1" CONTROLLED INSPECTION FORM IS FILED AT THE BUILDING DEPARTMENT, SUCH FORM SHALL BE ACCOMPANIED BY A REPORT WHICH SHALL INCLUDE THE DATES OF INSPECTIONS, THE IDENTITY OF THE INSPECTOR, AND THE SCOPE OF WORK WHICH WAS OBSERVED.

5. WHEN A TRADE INSTALLING MECHANICAL WORK CAUSES STRUCTURAL MEMBERS OR RATED ASSEMBLIES TO LOSE THEIR
INTEGRITY, REPAIRS SHALL BE PERFORMED UNDER THE SUPERVISION OF A DESIGNATED PERSON.

6. BUILDING DEPARTMENT INSPECTORS SHALL REVIEW RECORDS AT JOB SITES TO MAKE CERTAIN THAT THERE IS ADEQUATE SELF-INSPECTION.

7. AS PER CHAPTER 1 OF TITLE 28-116.2.3 OF THE ADMINISTRATIVE C ODE OF 2008 NYC BC THE PERMIT APPLICATION SHALL SET FORTH AN INSPECTION PROGRAM FOR THE JOB. SUCH INSPECTORS MAY BE MADE BY APPROVED AGENCIES OR
BY THE DEPARTMENT AS PROVIDED IN THIS CODE OR IN THE RULES OF THE DEPARTMENT. SPECIAL INSPECTIONS SHALL BE PERFORMED ONLY BY INDIVIDUALS WHO ARE SPECIAL INSPECTORS. THE PERMIT HOLDER SHALL NOTIFY THE RELEVANT SPECIAL
INSPECTORS IN WRITING AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY WORK REQUIRING SPECIAL
INSPECTION.
-THE NAME AND BUSINESS ADDRESSES OF SPECIAL INSPECTORS AND APPROVED AGENCIES SHALL BE SET FORTH IN THE WORK PERMIT APPLICATION.
-A RECORD OF ALL INSPECTIONS SHALL BE KEPT BY THE PERSON PERFORMING THE INSPECTION.
-THE COMMISSIONER MAY REQUIRE INSPECTION REPORTS TO BE FILED WITH THE DEPARTMENT.
- RECORDS OF INSPECTIONS MADE BY APPROVED AGENCIES AND SPECIAL INSPECTORS SHALL BE MAINTAINED BY SUCH
PERSONS FOR A PERIOD OF SIX YEARS AFTER SIGN-OFF OF THE JOB OR FOR SUCH OTHER PERIOD OF TIME AS THE COMMISSIONER MAY REQUIRE AND SHALL BE MADE AVAILABLE TO THE DEPARTMENT UPON REQUEST.

SPECIAL INSPECTIONS

Y	N	ITEMS		CODE
	X	- FLOOD ZONE COMPLIANCE		BC G105
	X	- FIRE ALARM TEST		BC 907, BC 1704.13
	X	- PHOTOLUMINESCENCE EXIT PATH MARKINGS	TR7	BC 1026.11
	X	- EMERGENCY POWER SYSTEMS (GENERATORS)		BC 1704.13, BC 2702
X		- STRUCTURAL STEEL - WELDING		BC 1704.3.1
X		- STRUCTURAL STEEL - ERECTION & BOLTING		BC 1704.3.2, BC 1704.3.3
	X	- STRUCTURAL COLD - FORMED STEEL		BC 1704.3.4
X		- CONCRETE - CAST-IN-PLACE		BC 1704.4
	X	- CONCRETE - PRECAST		BC 1704.4
	X	- CONCRETE - PRESTRESSED		BC 1704.4
X		- MASONRY		BC 1704.5
	X	- WOOD - OFF-SITE FABRICATION OF STRUCTURAL ELEMENTS		BC 1704.6
	X	- WOOD - INSTALLATION OF HIGH-LOAD DIAPHRAGMS		BC 1704.6.1
	X	- WOOD - INSTALLATION OF METAL-PLATE-CONNECTED TRUSSES		BC 1704.6.3
	X	- WOOD - INSTALLATION OF PREFABRICATED I-JOISTS		BC 1704.6.4
X		- SOILS - SITE PREPARATION		BC 1704.7.1
	X	- SOILS - FILL PLACEMENT & IN-PLACE DENSITY		BC 1704.7.2, BC 1704.7.3
X		- SOILS - INVESTIGATIONS (BORING/TEST PITS)	TR4	BC 1704.7.4
	X	- PILE FOUNDATIONS & DRILLED PIER INSTALLATION	TR5	BC 1704.8
	X	- PIER FOUNDATIONS		BC 1704.9
X		- UNDERPINNING		BC 1704.9.1
	X	- WALL PANELS, CURTAIN WALLS, AND VENEERS		BC 1704.10
	X	- SPRAYED FIRE-RESISTANCE MATERIALS		BC 1704.11
X		- EXTERIOR INSULATION FINISH SYSTEMS (EIFS)		BC 1704.12
	X	- ALTERNATIVE MATERIALS - OTCR BUILDING BULLETIN # _____		BC 1704.13
	X	- SMOKE CONTROL SYSTEMS		BC 1704.14
X		- MECHANICAL SYSTEMS		BC 1704.15
	X	- FUEL-OIL STORAGE AND FUEL-OIL PIPING SYSTEMS		BC 1704.16
	X	- HIGH-PRESSURE STEAM PIPING (WELDING)		BC 1704.17
	X	- FUEL-GAS PIPING (WELDING)		BC 1704.18
X		- STRUCTURAL SAFETY - STRUCTURAL STABILITY		BC 1704.19
	X	- MECHANICAL DEMOLITION		BC 1704.19, BC 3306.6
X		- EXCAVATION - SHEETING, SHORING, AND BRACING		BC 1704.19, BC 3304.4.1
	X	- SOIL PERCOLATION TEST - DRYWELL		BC 1704.20.1
	X	- SOIL PERCOLATION TEST - SPETIC		BC 1704.20.1
	X	- SITE STORM DRAINAGE DISPOSAL AND DETENTION SYSTEM INSTALLATION		BC 1704.20
	X	- SEPTIC SYSTEM INSTALLATION		BC 1704.20
X		- SPRINKLER SYSTEMS		BC 1704.21
	X	- STANDPIPE SYSTEMS		BC 1704.22
X		- HEATING SYSTEMS		BC 1704.23
X		- CHIMNEYS		BC 1704.24
X		- FIRESTOP, DRAFTSTOP, AND FIREBLOCK SYSTEMS		BC 1704.25
	X	- ALUMINUM WELDING		BC 1704.26
	X	- SEISMIC ISOLATION SYSTEMS		BC 1707.8
X		- CONCRETE TEST CYLINDERS	TR2	BC 1905.6
X		- CONCRETE DESIGN MIX	TR3	BC 1905.3
ENERGY CODE PROGRESS INSPECTION ITEMS				
X		- PROTECTION OF FOUNDATION INSULATION		(IA1),(IIA1)
X		- INSULATION PLACEMENT & R VALUES		(IA2),(IIA2)
X		- FENESTRATION THERMAL VALUES & RATINGS		(IA3),(IIA3)
X		- FENESTRATION RATINGS FOR AIR LEAKAGE		(IA4),(IIA4)
X		- FENESTRATION AREAS		(IA5),(IIA5)
X		- AIR SEALING AND INSULATION - VISUAL		(IA6),(IIA6)
	X	- AIR SEALING AND INSULATION - TESTING		(IA7)
X		- PROJECTION FACTORS		(IIA7)
	X	- LOADING DECK WEATHER SEALS		(IIA8)
	X	- VESTIBULES		(IIA9)
	X	- FIREPLACES		(IB1), (IIB1)
X		- DAMPERS INTEGRAL TO BUILD ENVELOPE		(IB2), (IIB2)
X		- HVAC AND SERVICE WATER HEATING EQUIPMENT		(IB3), (IIB3)
X		- HVAC AND SERVICE WATER HEATING SYSTEM CONTROLS		(IB4), (IIB4)
X		- DUCT PLENUM AND PIPING INSULATION AND SEALING		(IB5), (IIB5)
	X	- DUCT LEAKAGE TESTING		(IB6), (IIB6)
X		- ELECTRICAL METERING		(IC1), (IIC1)
X		- LIGHTING IN DWELLING UNITS		(IC2), (IIC2)
X		- INTERIOR LIGHTING POWER		(IIC3)
X		- EXTERIOR LIGHTING POWER		(IIC4)
X		- LIGHTING CONTROLS		(IIC5)
	X	- EXIT SIGNS		(IIC6)
	X	- TANDEM WIRING		(IIC7)
	X	- ELECTRICAL MOTORS		(IIC8)
X		- MAINTENANCE INFORMATION		(IID1), (IID1)
X		- PERMANENT CERTIFICATE		(IID2)
PROGRESS INSPECTION ITEMS				
	X	- PRELIMINARY		28-116.2.1, BC 109.2
X		- FOOTING AND FOUNDATION		BC 109.3.1
	X	- LOWEST FLOOR ELEVATION (ATTACH FEMA FORM)		BC 109.3.2
X		- FRAME INSPECTION		BC 109.3.3
X		- ENERGY CODE COMPLIANCE INSPECTIONS	TR8	BC 109.3.5
X		- FIRE-RESISTANCE RATED CONSTRUCTION		BC 109.3.4
	X	- PUBLIC ASSEMBLY EMERGENCY LIGHTING		28-116.2.2
		- FINAL		28-116.2.4.2, BC 109.5, DIRECTIVE 14 OF 1975, AND 1 RCNY §§ 101-10

ABBREVIATIONS

A

A/C	AIR CONDITIONING
ACOUS.	ACOUSTICAL
ADJ.	ADJUSTABLE
ALUM.	ALUMINUM
ALT.	ALTERNATE
ANOD.	ANODIZED
APPD.	APPROVED
APPROX.	APPROXIMATE
ARCH.	ARCHITECT(URAL)
AVG.	AVERAGE
A.F.F.	ABOVE FINISH FLOOR

B

BD.	BOARD
BLDG.	BUILDING
BLKG.	BLOCKING
BRKT.	BRACKET
BRZ.	BRONZE

C

CAB.	CABINET
CLKG.	CALKING
℄	CENTER LINE
CLG.	CEILING
CLOS.	CLOSET
CLR. OPG.	CLEAR OPENING
COL.	COLUMN
CONC.	CONCRETE
CONN.	CONNECT(ION)
CONST.	CONSTRUCTION
CONT.	CONTINUOUS
CORR.	CORRIDOR
C.T.	CERAMIC TILE
CTR.	CENTER
C.W.	COLD WATER

D

DBL.	DOUBLE
DEPT.	DEPARTMENT
DET.	DETAIL
DIA.	DIAMETER
DIM.	DIMENSION
DIV.	DIVISION
DN.	DOWN
DR.	DOOR
DWG.	DRAWING
DRW.	DRAWER

E

(E.)	EAST
ELEC.	ELECTRIC
EL.	ELEVATION
ENGR.	ENGINEER
EQ.	EQUAL
EQUIP.	EQUIPMENT
EXH.	EXHAUST
E, EXIST.	EXISTING
EXT.	EXTERIOR
ELECT.	ELECTRICAL

F

F.ALM.	FIRE ALARM
FABR.	FABRICATE
F.E.	FIRE EXTINGUISHER
F.E.C.	FIRE EXTINGUISHER CABINET
F.F.	FINISH FLOOR
FIN.	FINISH(ED)
FLR.	FLOOR
FLUOR.	FLUORESCENT
F.O.W.	FACE OF WALL
FPSC	FIRE PROOF SELF-CLOSING
FR.	FRAME
FT.	FOOT OR FEET
F.T.	FIRE-TREATED
FURR.	FURRING

G

GA.	GAUGE
GEN.	GENERAL
GL.	GLASS OR GLAZED
GYP. BD.	GYPSUM BOARD

H

HDWR.	HARDWARE
HDWD.	HARDWOOD
HGT.	HEIGHT
H.M.	HOLLOW METAL
HORIZ.	HORIZONTAL
H.W.	HOT WATER

I

I.D.	INSIDE DIAMETER
INCL.	INCLUDE(D)(ING)
INFO.	INFORMATION
INCAN.	INCANDESCENT

J

JAN.	JANITOR
⌊	

∠

∠	ANGLE
LAM.	LAMINATE
LB. (OR #)	POUND
L.H.	LEFT HAND

M

MAINT.	MAINTENANCE
MAX.	MAXIMUM
MECH.	MECHANICAL
MTL.	METAL
MEZZ.	MEZZANINE
MFR.	MANUFACTURER
M.O.	MASONRY OPENING
MIN.	MINIMUM
MTD.	MOUNTED
MUL.	MULLION
M.R.	MOISTURE RESISTANT

N

(N)	NORTH
N.	NEW
N.I.C.	NOT IN CONTRACT
NO.(OR #)	NUMBER
N.T.S.	NOT TO SCALE

O

O.A.	OVERALL
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
O.H.	OPPOSITE HAND
OPNG.	OPENING
OPP.	OPPOSITE
ORIG.	ORIGINAL

P

P.LAM.	PLASTIC LAMINATE
PLAS.	PLASTER
PLY.	PLYWOOD
PNL.	PANEL
PR.	PAIR
PREFAB.	PREFABRICATED
PTN.	PARTITION
PTD.	PAINTED

Q

QUAN.	QUANTITY

R

REL.	RELOCATE
R.	REMOVE
R/A	RETURN AIR
RAD.	RADIUS
RECEP.	RECEPTACLE
REF.	REFERENCE
REFL.	REFLECTED
REINF.	REINFORCED
REQD.	REQUIRED
R.H.	RIGHT HAND
RM.	ROOM
RND.	ROUND
R.O.	ROUGH OPENING
REV.	REVISION

S

(S)	SOUTH
S.C.	SOLID CORE
SCHED.	SCHEDULE
SECT.	SECTION
SHT.	SHEET
SIM.	SIMILAR
SQ.	SQUARE
SF	SQUARE FEET
S.S.	STAINLESS STEEL
STD.	STANDARD
STRUCT.	STRUCTURAL
SUSP.	SUSPEND(ED)
SYMM.	SYMMETRICAL
SYS.	SYSTEM

T

T&B	TOP AND BOTTOM
TECH.	TECHNICAL
TEL.	TELEPHONE
TEMPD.	TEMPERED
TEMP. GL.	TEMPERED GLASS
THK.	THICK(NESS)
TYP.	TYPICAL
T.B.D.	TO BE DETERMINED
T.B.S.	TO BE SELECTED

U

U.L.	UNDERWRITERS LABORATORY
UTIL.	UTILITY
U.O.N.	UNLESS OTHERWISE NOTED

V

VERT.	VERTICAL
VEST.	VESTIBULE
V.I.F.	VERIFY IN FIELD
VOL.	VOLUME

W

(W)	WEST
W/	WITH
W.C.	WALL COVERING
WD	WOOD
W.H.	WATER HEATER
W/O	WITHOUT
WT.	WEIGHT

Y

YD.	YARD

MISCELLANEOUS

∅	ROUND
⍁	SQ.FT.
□	SQUARE

LEGEND

- EXISTING WALLS
- TO BE REMOVED
- PROPOSED INTERIOR PARTITIONS
- PROPOSED 2 HOUR WALL
- PROPOSED CONCRETE WALL
- NEW EXTERIOR WALL
- SD / CM — SMOKE & CARBON MONOXIDE DETECTOR HARD WIRED & INTERLOCKED SHALL COMPLY TO NYC REG.
- MV 50 CFM — MECHANICAL VENT - 50 CFM MIN.
- FD — FLOOR DRAIN
- RD — ROOF DRAIN
- AD — AREA DRAIN
- 101 — DOOR TAG
- 1t — WINDOW TAG
- S — SPRINKLER HEAD
- T — PROGRAMMABLE THERMOSTAT
- EARTH
- BRICK
- CONCRETE MASONRY UNITS
- GLASS BLOCK
- STEEL
- BATT INSULATION
- CAST-IN-PLACE CONCRETE
- INSULATION RIGID
- PLYWOOD
- ALUMINUM
- FINISH WOOD
- GYPSUM BOARD

DIEGO AGUILERA ARCHITECTS, P.C.
DESIGN & ARCHITECTURE

DIEGO AGUILERA ARCHITECTS P.C.
97-40 62ND DRIVE. SUITE 4L
REGO PARK NY 11374
(718) 606 6008 - (718) 896 9432
DBAGUILERA@AOL.COM
LICENSE #: 032873

DESIGN CONSULTANT:

SAMUEL WIEDER + ASSOCIATES
146 SPENCER STREET, SUITE #3006
BROOKLYN NY, 11205
T. 718.484.3201

STRUCTURAL ENGINEER:

MEP ENGINEER:

MUNICIPAL CONSULTANT:

OWNER:

MOSHE SILBERSTIEN
917-488-4651
SILBER175@GMAIL.COM

LOCATION:

77 CLAY STREET
BROOKLYN NY 11222

SITE MAP

PROJECT:

NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:

GENERAL NOTES

DOB APPLICATION # :

#.....

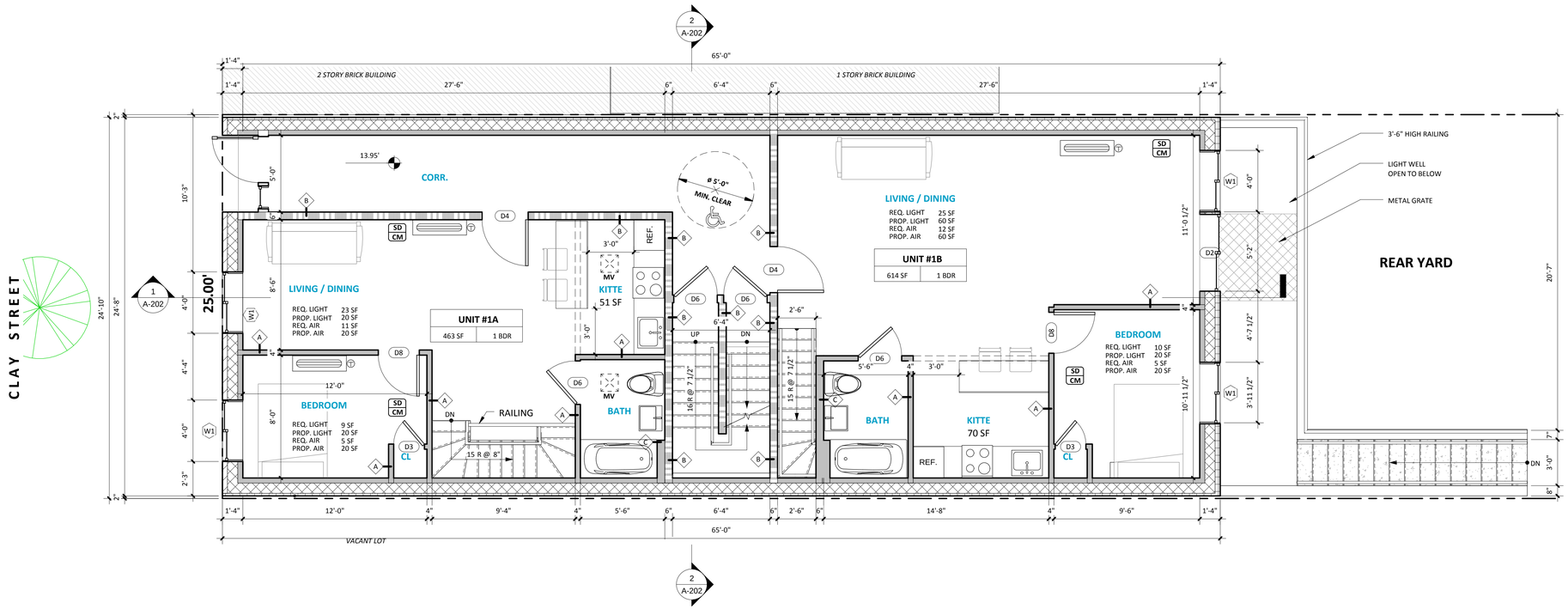
DOB BSCAN :

SEAL AND SIGNATURE

DATE: 8/27/2014 12:44:59 PM
SCALE: As indicated
DRAWING BY: SW
DRAWING No.:

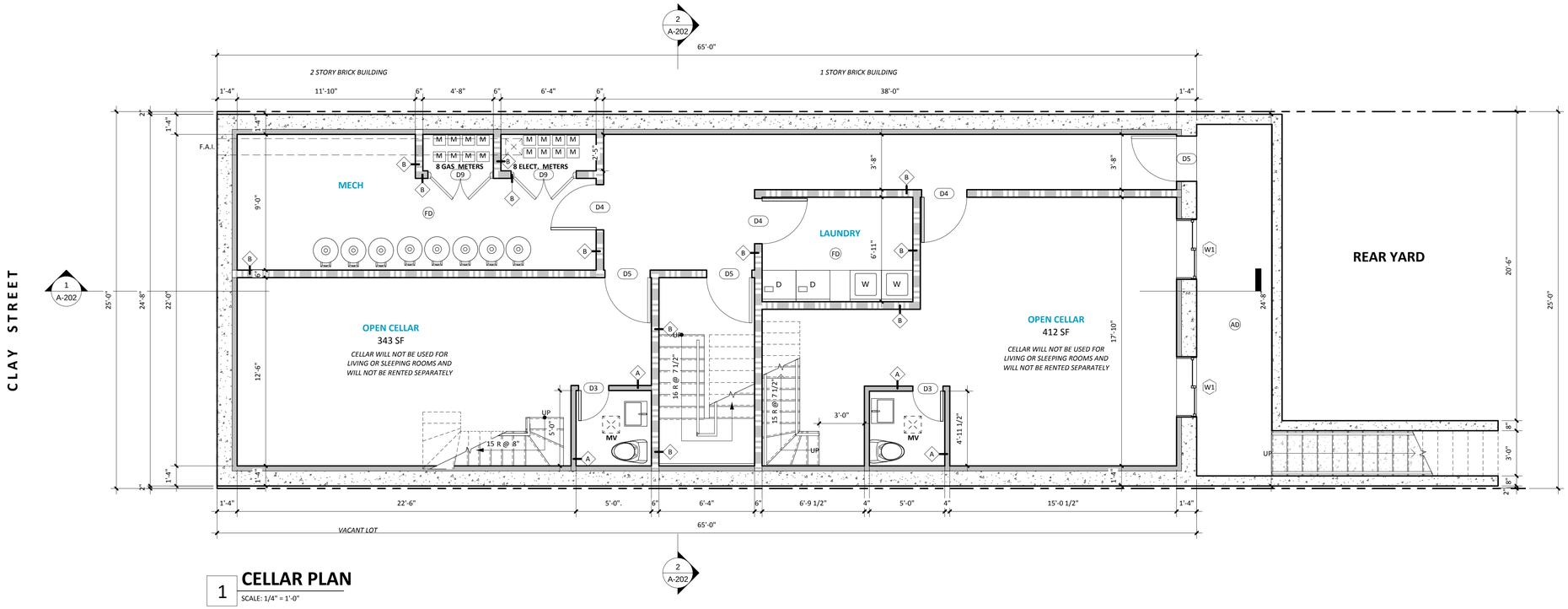
G-101 .00

SHEET 6 OF 17



2 1ST FLOOR PLAN

SCALE: 1/4" = 1'-0"



1 CELLAR PLAN

SCALE: 1/4" = 1'-0"

DIEGO AGUILERA ARCHITECTS P.C.
97-40 62ND DRIVE. SUITE 4L
REGO PARK NY 11374
(718) 606 6008 - (718) 896 9432
DBAGUILERA@AOL.COM
LICENSE #: 032873

DESIGN CONSULTANT:

SAMUEL WIEDER + ASSOCIATES
146 SPENCER STREET, SUITE #3006
BROOKLYN NY, 11205
T. 718.484.3201

STRUCTURAL ENGINEER:

MEP ENGINEER:

MUNICIPAL CONSULTANT:

OWNER:

MOSHE SILBERSTIEN
917-488-4651
SILBER175@GMAIL.COM

LOCATION:

77 CLAY STREET
BROOKLYN NY 11222

SITE MAP

PROJECT:

NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:

CELLAR & 1ST FLOOR PLAN

DOB APPLICATION # :

#.....

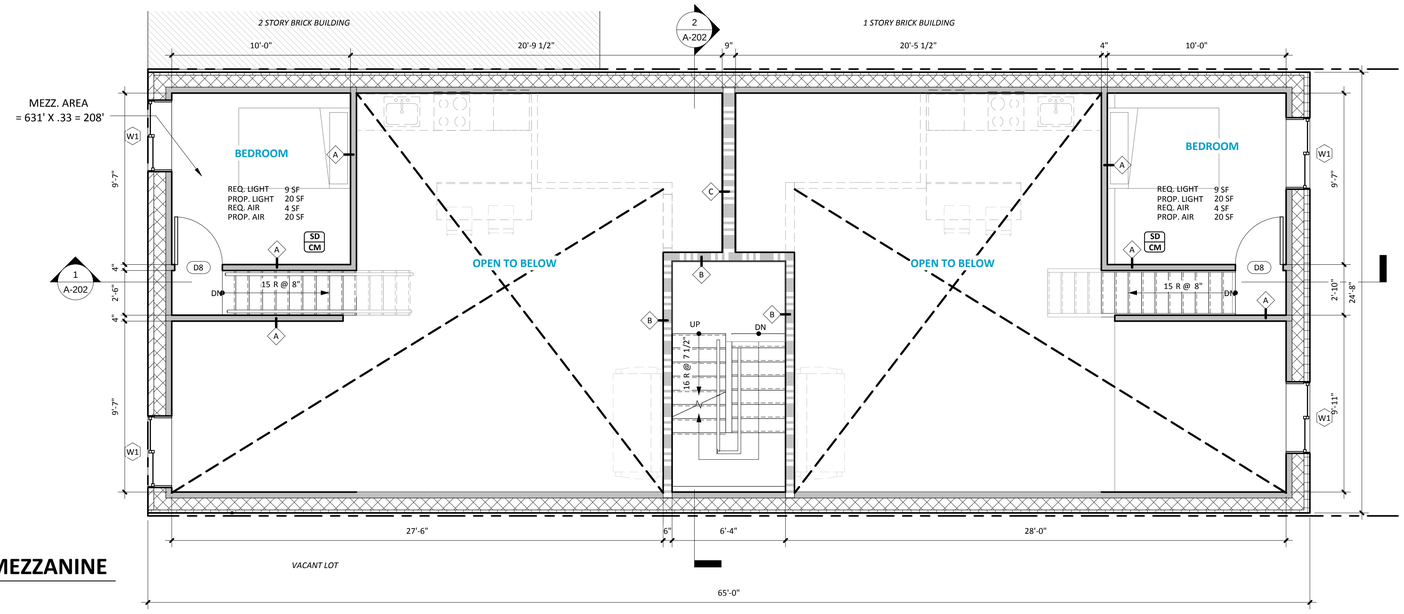
DOB BSCAN :

SEAL AND SIGNATURE

DATE: 8/27/2014 12:44:31 PM
SCALE: 1/4" = 1'-0"
DRAWING BY: SW
DRAWING No.:

A-100 .00

SHEET 9 OF 17

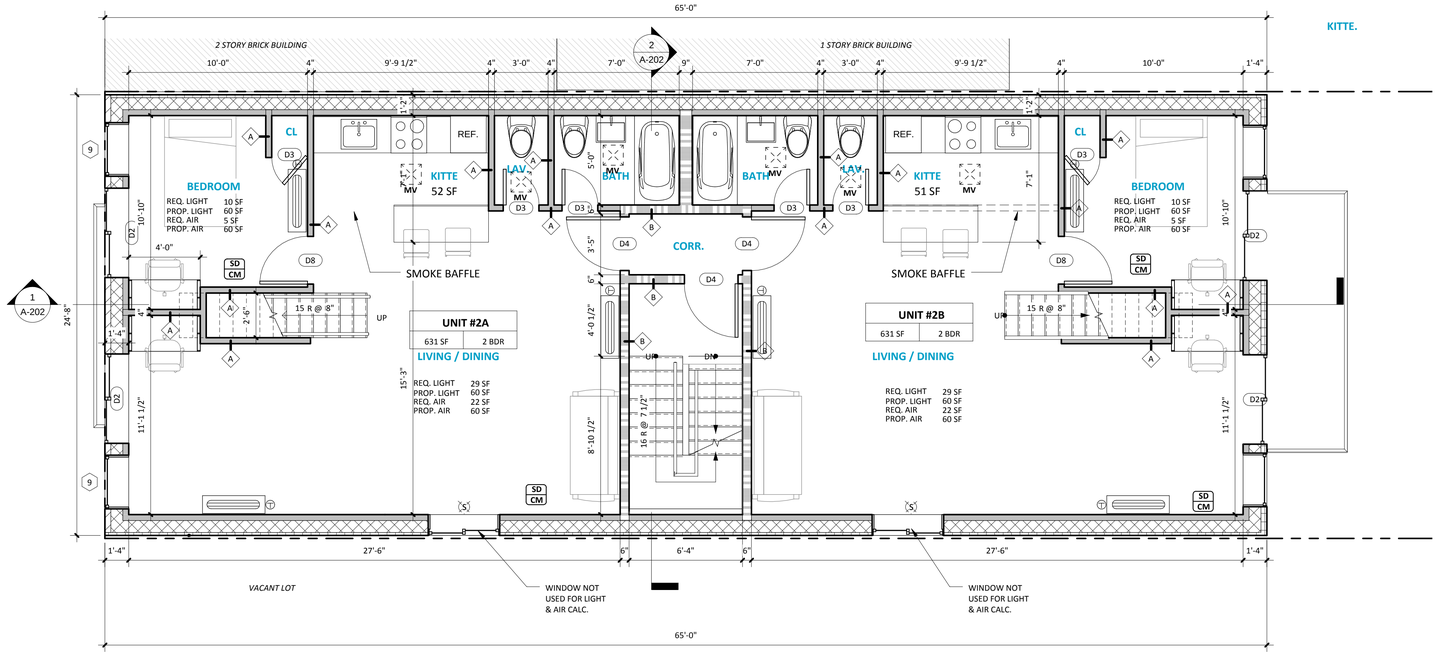


CLAY STREET

REAR YARD

1 **2ND FLOOR MEZZANINE**

SCALE: 1/4" = 1'-0"



CLAY STREET

REAR YARD

2 **2ND FLOOR PLAN**

SCALE: 1/4" = 1'-0"

DIEGO AGUILERA ARCHITECTS, P.C.
DESIGN & ARCHITECTURE

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LICENSE #: 032873

DESIGN CONSULTANT:

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BROOKLYN NY, 11205
T. 718.484.3201

STRUCTURAL ENGINEER:

MEP ENGINEER:

MUNICIPAL CONSULTANT:

OWNER:

MOSHE SILBERSTIEN
917-488-4651
SILBER175@GMAIL.COM

LOCATION:

77 CLAY STREET
BROOKLYN NY 11222

SITE MAP

PROJECT:

NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:

2ND FLOOR & MEZZ. FLOOR PLANS

DOB APPLICATION # :

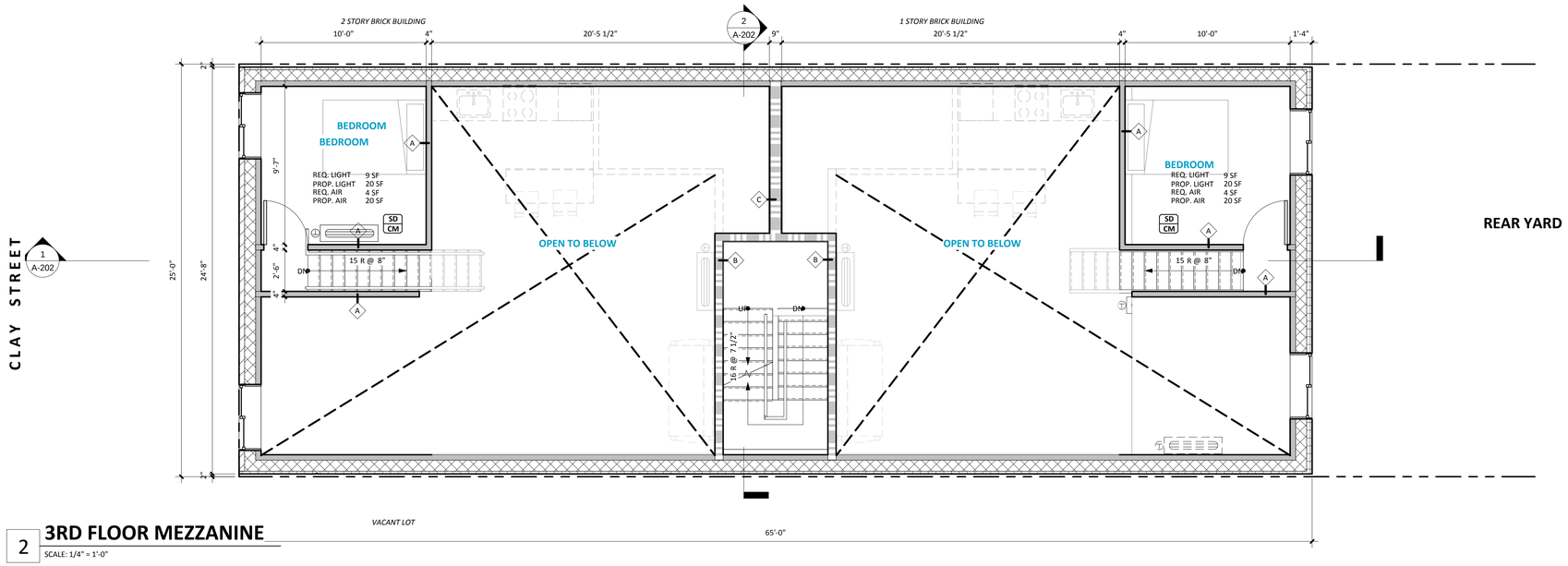
#.....

DOB BSCAN :

SEAL AND SIGNATURE

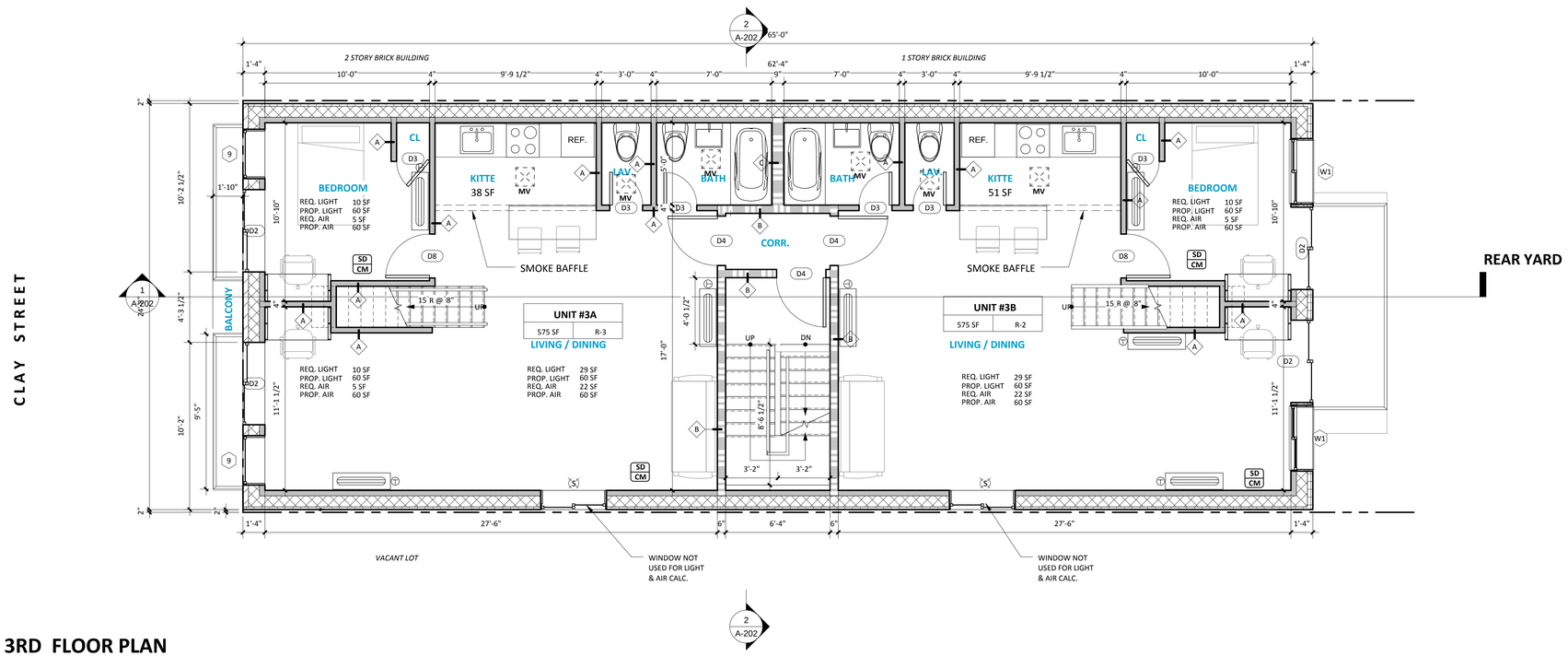
DATE: 8/27/2014 12:44:33 PM
SCALE: 1/4" = 1'-0"
DRAWING BY: SW
DRAWING No.:

A-101 .00



2 3RD FLOOR MEZZANINE

SCALE: 1/4" = 1'-0"



1 3RD FLOOR PLAN

SCALE: 1/4" = 1'-0"

DIEGO AGUILERA ARCHITECTS, P.C.
DESIGN & ARCHITECTURE

DIEGO AGUILERA ARCHITECTS P.C.
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BROOKLYN NY, 11205
T. 718.484.3201

STRUCTURAL ENGINEER:

MEP ENGINEER:

MUNICIPAL CONSULTANT:

OWNER:

MOSHE SILBERSTIEN
917-488-4651
SILBER175@GMAIL.COM

LOCATION:

77 CLAY STREET
BROOKLYN NY 11222

SITE MAP

PROJECT:

NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:

3RD FLOOR & MEZZ. FLOOR PLANS

DOB APPLICATION # :

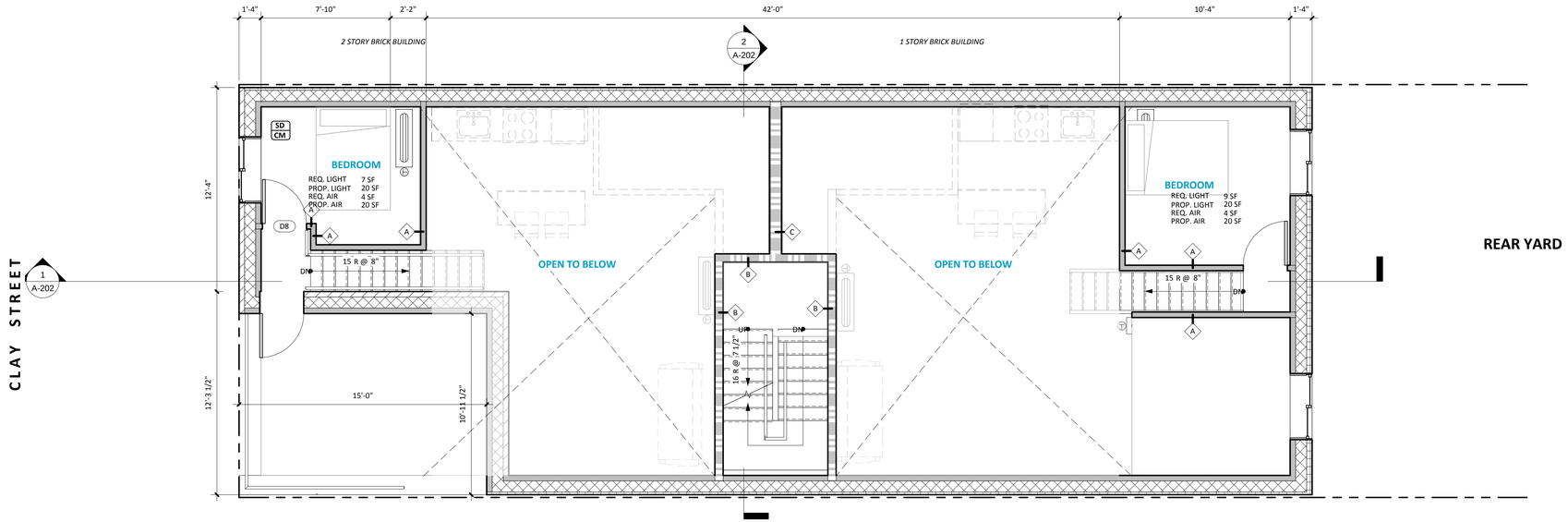
#.....

DOB BSCAN :

SEAL AND SIGNATURE

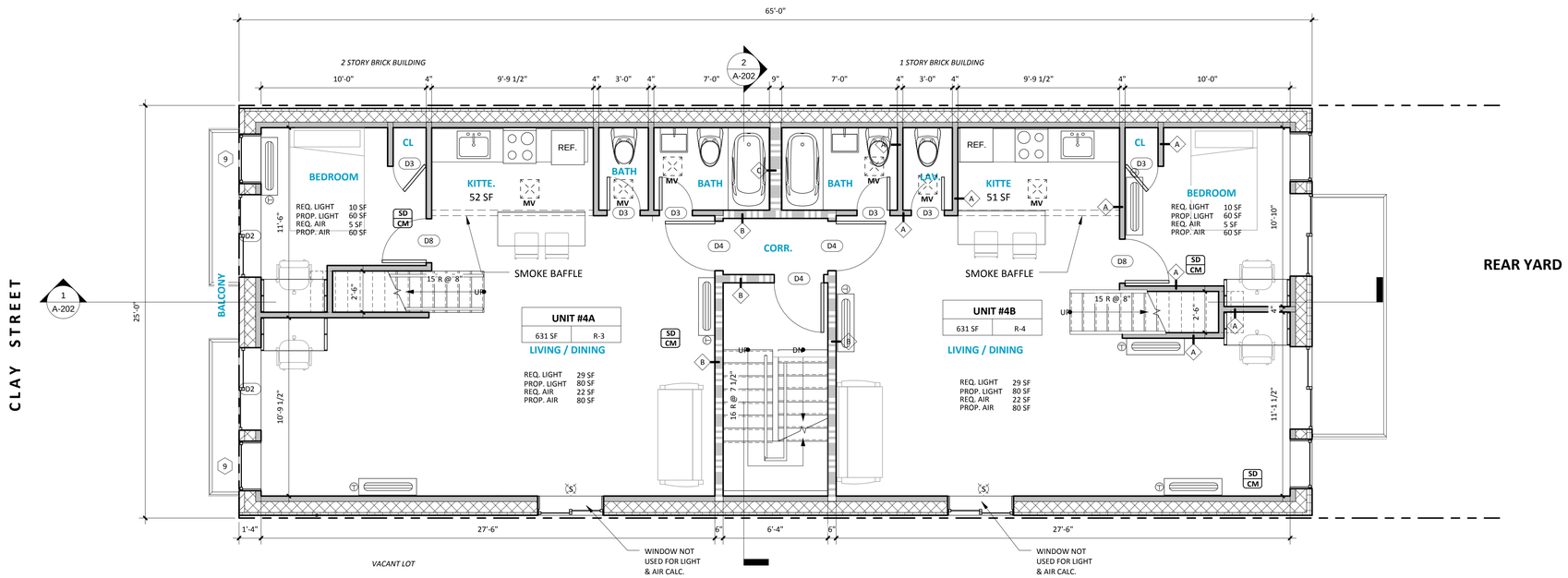
DATE: 8/27/2014 12:44:35 PM
SCALE: 1/4" = 1'-0"
DRAWING BY: SW
DRAWING No.:

A-102 .00



2 4TH FLOOR MEZZANINE

SCALE: 1/4" = 1'-0"



1 4TH FLOOR PLAN

SCALE: 1/4" = 1'-0"

DIEGO AGUILERA ARCHITECTS, P.C.
DESIGN & ARCHITECTURE

DIEGO AGUILERA ARCHITECTS P.C.
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DBAGUILERA@AOL.COM
LICENSE #: 032873

DESIGN CONSULTANT:

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BROOKLYN NY, 11205
T. 718.484.3201

STRUCTURAL ENGINEER:

MEP ENGINEER:

MUNICIPAL CONSULTANT:

OWNER:

MOSHE SILBERSTIEN
917-488-4651
SILBER175@GMAIL.COM

LOCATION:

77 CLAY STREET
BROOKLYN NY 11222

SITE MAP

PROJECT:

NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:

4TH FLOOR & MEZZ. FLOOR PLANS

DOB APPLICATION # :

#.....

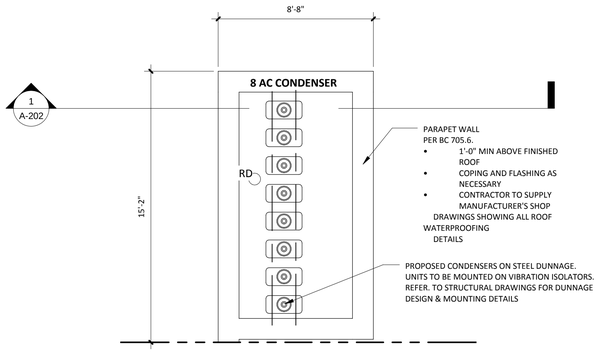
DOB BSCAN :

SEAL AND SIGNATURE

DATE: 8/27/2014 12:44:36 PM
SCALE: 1/4" = 1'-0"
DRAWING BY: SW
DRAWING No.:

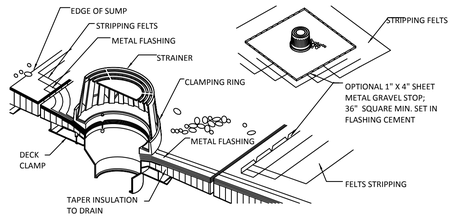
A-103 .00

SHEET 12 OF 17



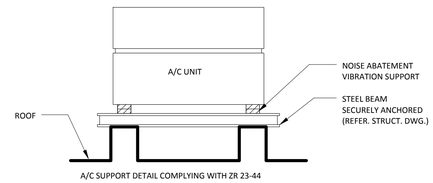
2 BULKHEAD PLAN

SCALE: 1/4" = 1'-0"



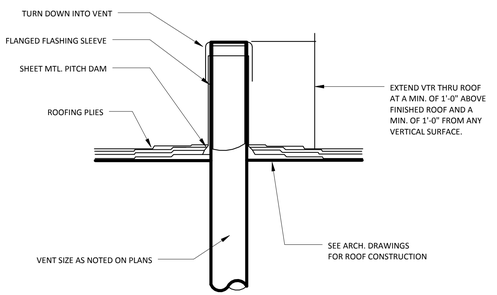
3 ROOF DRAIN DETAIL

SCALE: 1" = 1'-0"



4 HVAC ROOF DETAIL

SCALE: 3/8" = 1'-0"



5 VENT THRU ROOF DETAIL

SCALE: 1 1/2" = 1'-0"

1 ROOF PLAN

SCALE: 1/4" = 1'-0"

DIEGO AGUILERA ARCHITECTS, P.C.
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DBAGUILERA@AOL.COM
LICENSE #: 032873

DESIGN CONSULTANT:

SAMUEL WIEDER + ASSOCIATES
146 SPENCER STREET, SUITE #3006
BROOKLYN NY, 11205
T. 718.484.3201

STRUCTURAL ENGINEER:

MEP ENGINEER:

MUNICIPAL CONSULTANT:

OWNER:

MOSHE SILBERSTIEN
917-488-4651
SILBER175@GMAIL.COM

LOCATION:

77 CLAY STREET
BROOKLYN NY 11222

SITE MAP

PROJECT:

NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:

ROOF & BULKHEAD PLAN

DOB APPLICATION # :

#.....

DOB BSCAN :

SEAL AND SIGNATURE

DATE: 8/27/2014 12:44:37 PM
SCALE: As indicated
DRAWING BY: SW
DRAWING No.:

A-104 .00

SHEET 13 OF 17

2 **REAR ELEVATION**

SCALE: 3/16" = 1'-0"

NOTE:
ALL EXTERIOR LIGHTING SHALL HAVEPHOTOSENSOR ,TIME OR ASTRONOMICAL CONTROLS

3 **CLAY STREET ELEVATION**

SCALE: 3/16" = 1'-0"

DIEGO AGUILERA ARCHITECTS, P.C.
DESIGN & ARCHITECTURE

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(718) 606 6008 - (718) 896 9432
DBAGUILERA@AOL.COM
LICENSE #: 032873

DESIGN CONSULTANT:

SAMUEL WIEDER + ASSOCIATES
146 SPENCER STREET, SUITE #3006
BROOKLYN NY, 11205
T. 718.484.3201

STRUCTURAL ENGINEER:

MEP ENGINEER:

MUNICIPAL CONSULTANT:

OWNER:

MOSHE SILBERSTIEN
917-488-4651
SILBER175@GMAIL.COM

LOCATION:

77 CLAY STREET
BROOKLYN NY 11222

SITE MAP

PROJECT:

NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:

ELEVATIONS

DOB APPLICATION # :

#.....

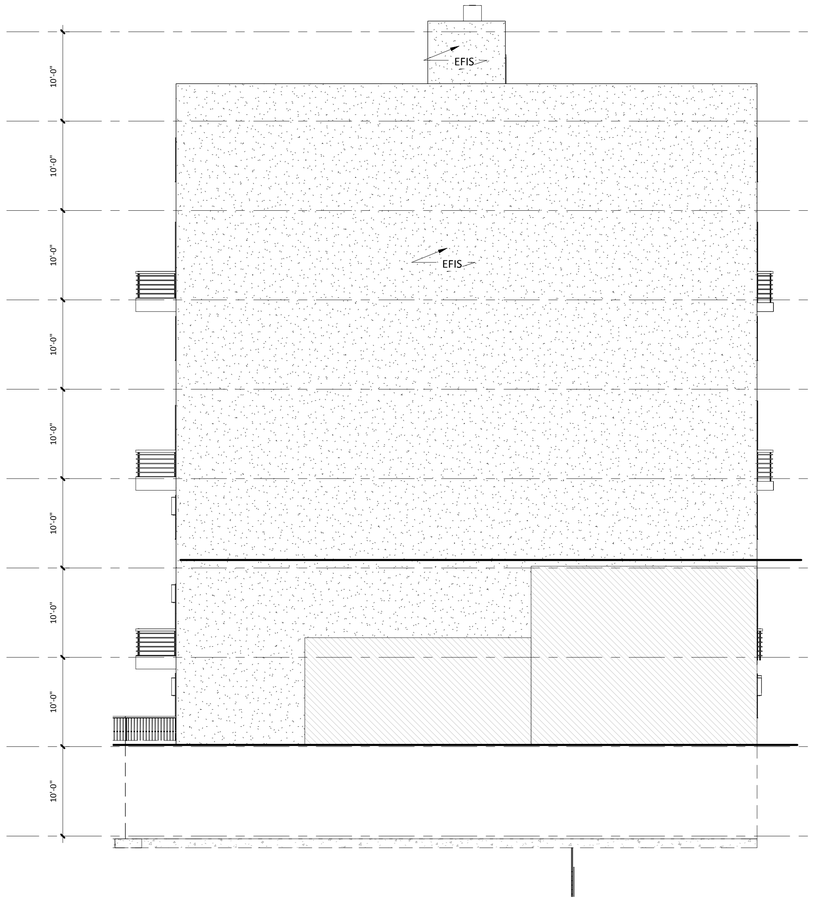
DOB BSCAN :

SEAL AND SIGNATURE

DATE: 8/27/2014 12:44:41 PM
SCALE: 3/16" = 1'-0"
DRAWING BY: SW
DRAWING No.:

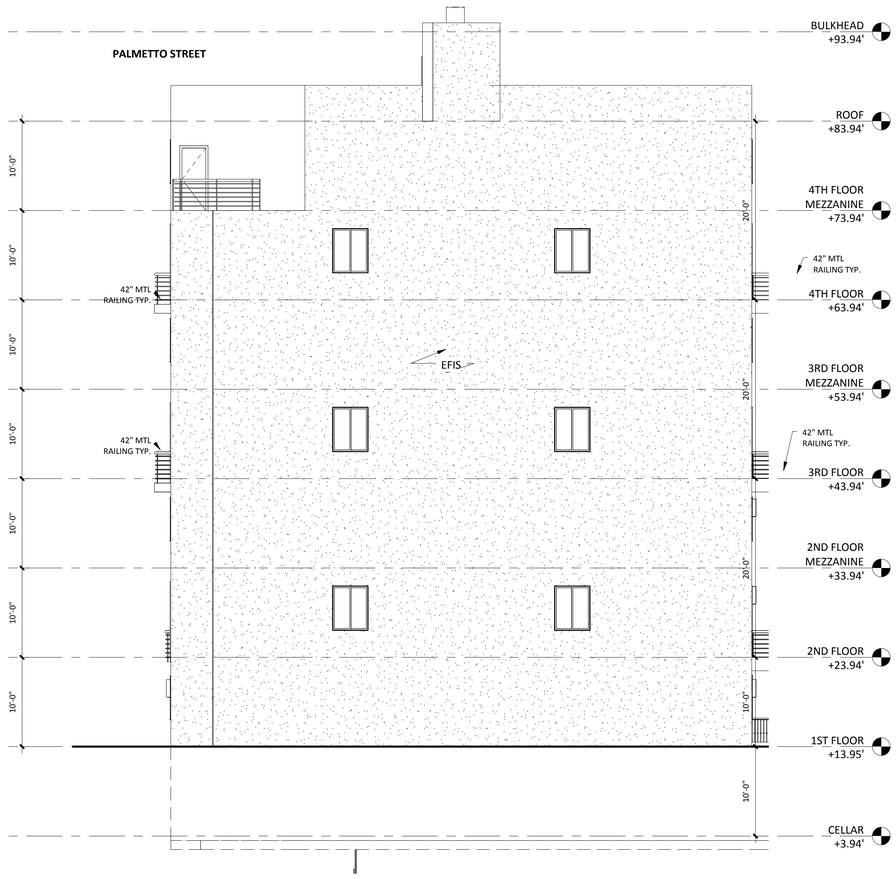
A-200 .00

SHEET 14OF 17



2 SIDE 1 ELEVATION

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



1 SIDE 2 ELEVATION

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

DIEGO AGUILERA ARCHITECTS, P.C.
DESIGN & ARCHITECTURE

DIEGO AGUILERA ARCHITECTS P.C.
97-40 62ND DRIVE. SUITE 4L
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DBAGUILERA@AOL.COM
LICENSE #: 032873

DESIGN CONSULTANT:

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BROOKLYN NY, 11205
T. 718.484.3201

STRUCTURAL ENGINEER:

MEP ENGINEER:

MUNICIPAL CONSULTANT:

OWNER:

MOSHE SILBERSTIEN
917-488-4651
SILBER175@GMAIL.COM

LOCATION:

77 CLAY STREET
BROOKLYN NY 11222

SITE MAP

PROJECT:

NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:

ELEVATIONS

DOB APPLICATION # :

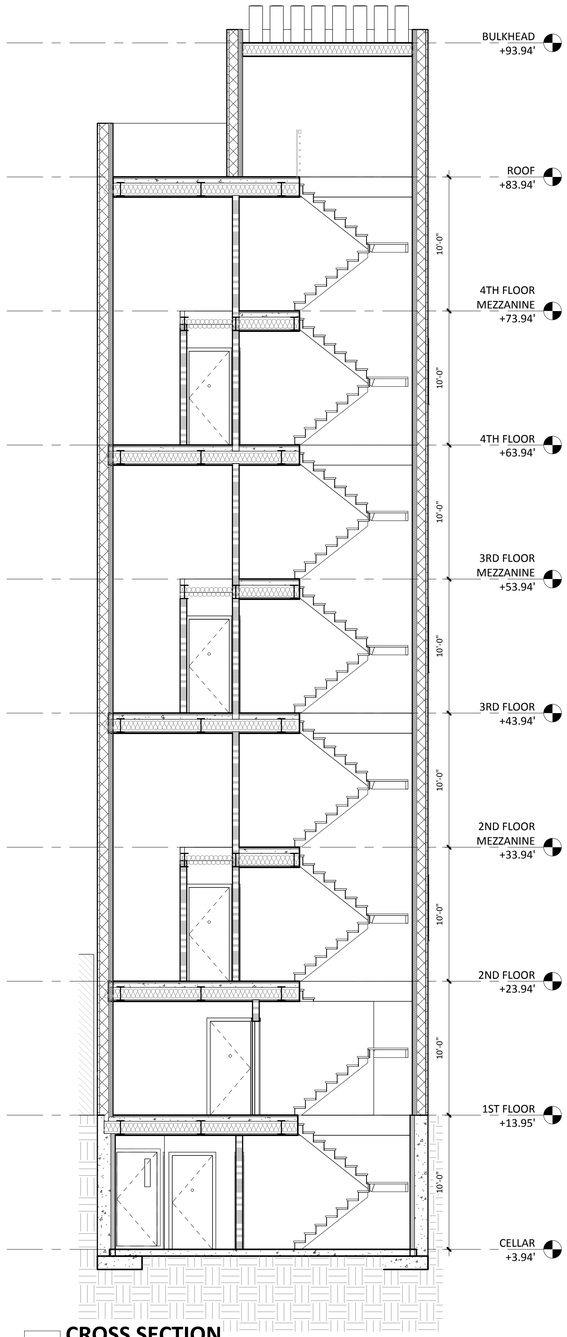
#.....

DOB BSCAN :

SEAL AND SIGNATURE

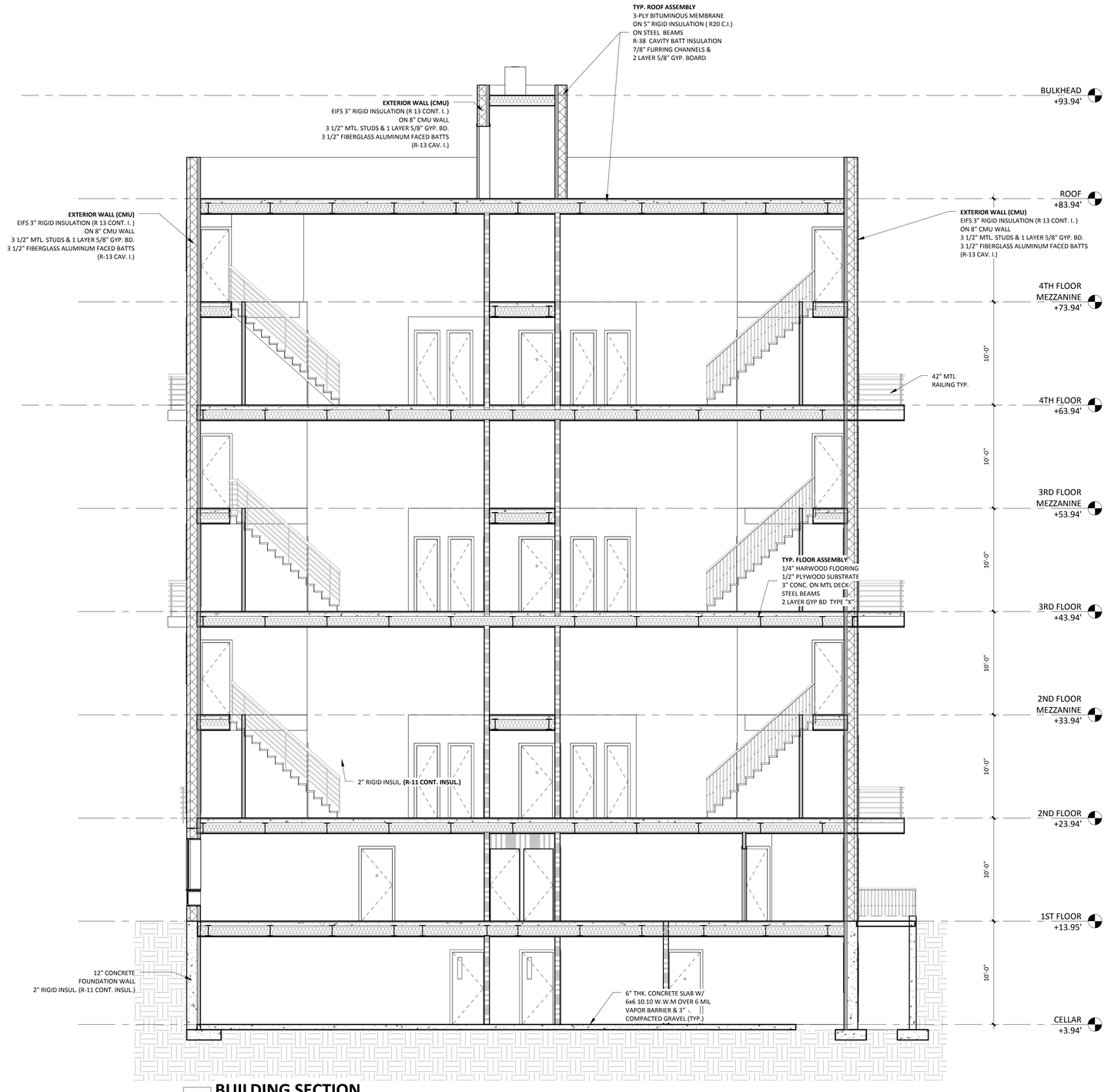
DATE: 8/27/2014 12:44:44 PM
SCALE: 1/8" = 1'-0"
DRAWING BY: SW
DRAWING No.:

A-201 .00



2 CROSS SECTION

SCALE: 3/16" = 1'-0"



1 BUILDING SECTION

SCALE: 3/16" = 1'-0"

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DESIGN & ARCHITECTURE

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MUNICIPAL CONSULTANT:

OWNER:

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SILBER175@GMAIL.COM

LOCATION:

77 CLAY STREET
BROOKLYN NY 11222

SITE MAP

PROJECT:

NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:

SECTIONS

DOB APPLICATION # :

#.....

DOB BSCAN :

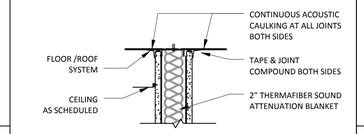
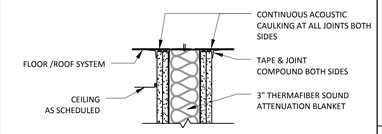
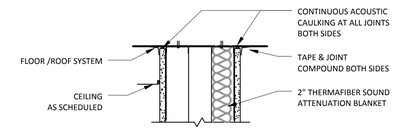
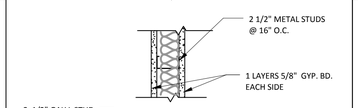
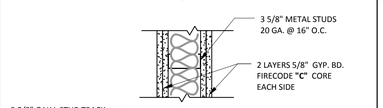
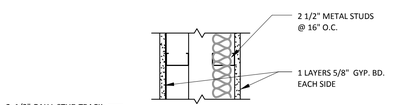
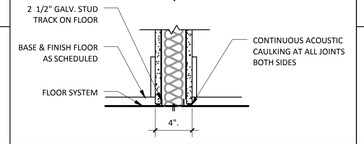
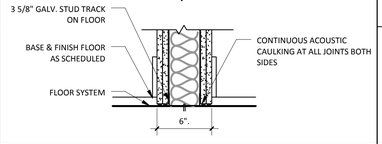
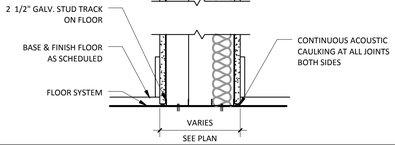
SEAL AND SIGNATURE

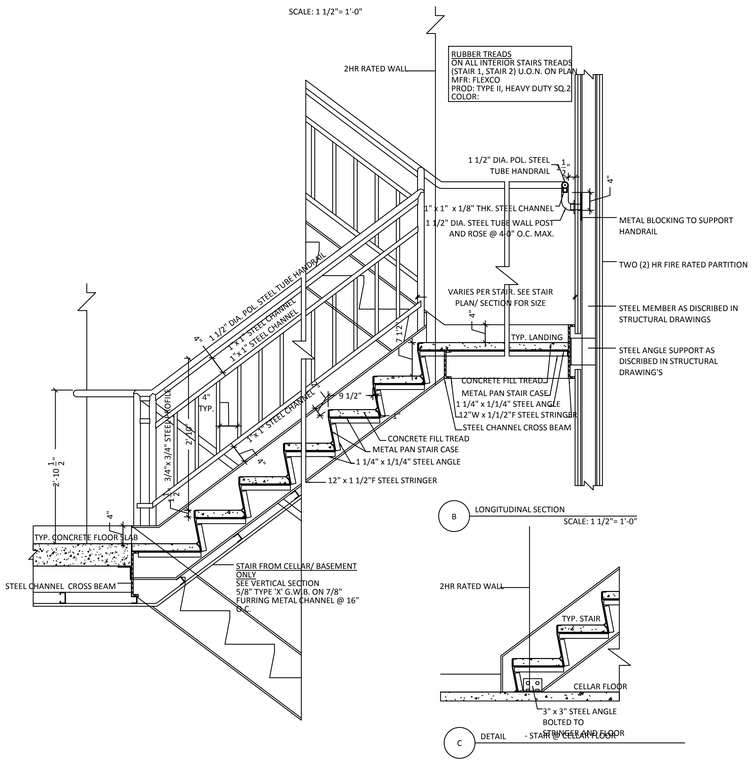
DATE: 8/27/2014 12:44:47 PM
SCALE: 3/16" = 1'-0"
DRAWING BY: SW
DRAWING No.:

A-202 .00

SHEET 16OF 17

PARTITION TYPES

	A	B	C
HEAD			
PLAN			
BASE			
UL DESIGN:	U419	U419	U493
STC:	44	51	59
NOTES:	AT BATHS. & PWD. RMS. : USE 1 LAYER 5/8" W.R. GYP BD. WITH CERAMIC TILE INSTALL CEMENT BD. INSTEAD OF GYP. BD. AT TUB LOCATION. WATERPROOFING MEMBRANE TURN UP 4" ABOVE FIN. FLR. AT KITCHEN CABINETS USE 3-5/8" METAL STUDS @ 12" O.C.	AT BATHS. & PWD. RMS. : USE 1 LAYER 5/8" W.R. GYP BD. & 1 LAYER 5/8" GYP BD. WITH CERAMIC TILE INSTALL CEMENT BD. INSTEAD OF GYP. BD. AT TUB LOCATION. WATERPROOFING MEMBRANE TURN UP 4" ABOVE FIN. FLR. AT KITCHEN CABINETS USE 3-5/8" METAL STUDS @ 12" O.C.	AT BATHS. & PWD. RMS. : USE 1 LAYER 5/8" W.R. GYP BD. & 1 LAYER 5/8" GYP BD. WITH CERAMIC TILE INSTALL CEMENT BD. INSTEAD OF GYP. BD. AT TUB LOCATION. WATERPROOFING MEMBRANE TURN UP 4" ABOVE FIN. FLR. AT KITCHEN CABINETS USE 3-5/8" METAL STUDS @ 12" O.C.
LOCATION:	WITHIN APARTMENTS	PUBLIC HALLWAYS BETWEEN APARTMENTS	AT KITCHEN & BATHROOMS WITHIN APARTMENTS
	INTERIOR WALL	2 HOUR INTERIOR WALL	CHASE WALL

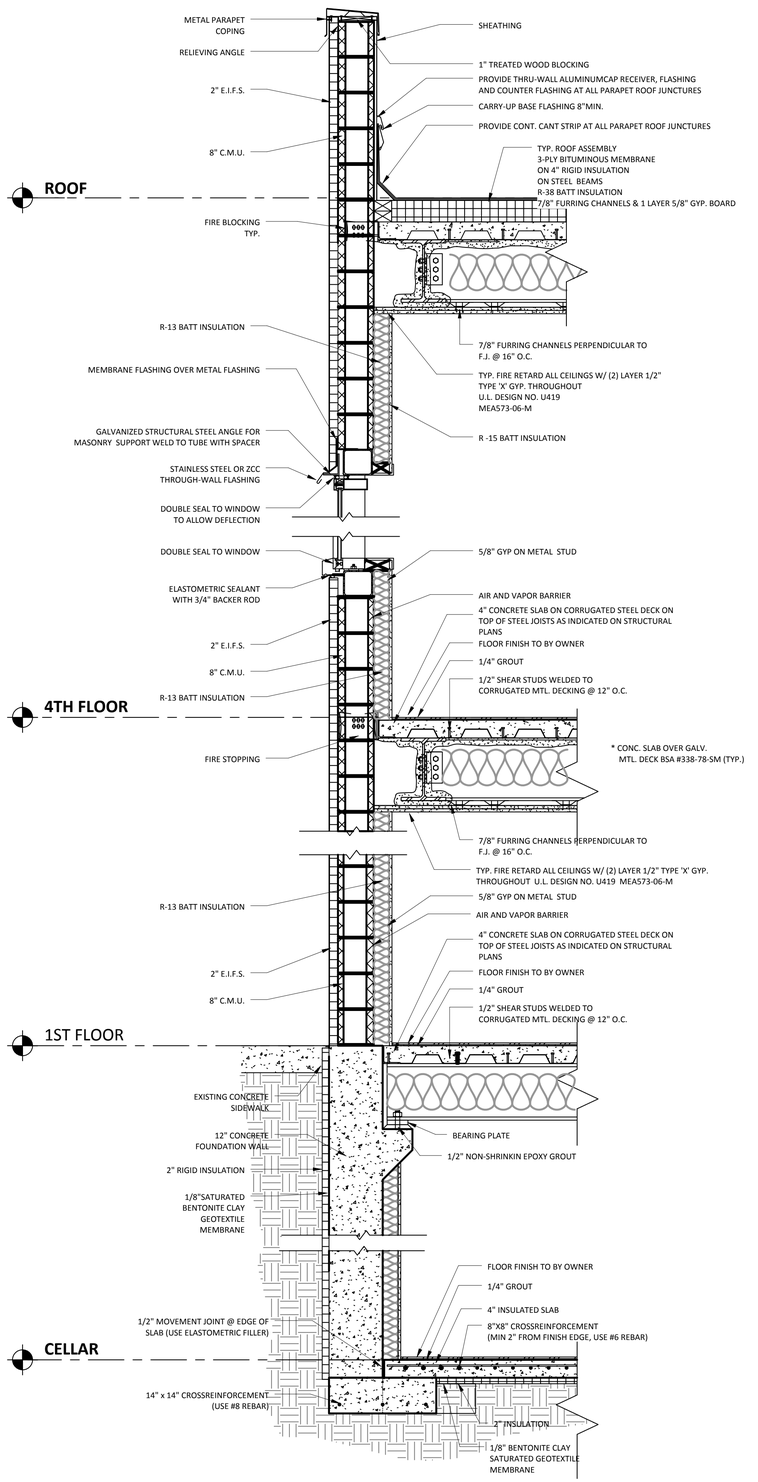


2 STAIR DETAIL

SCALE: 3/4" = 1'-0"

ROOF ASSEMBLY DETAIL
U.L. DESIGN NO. U419 MEA# 408-89-M (APP)

FLOOR/CEILING ASSEMBLY DETAIL
BSA #338-78-SM (TYP.)



3 WALL SECTION DETAIL

SCALE: 3/4" = 1'-0"

DIEGO AGUILERA ARCHITECTS P.C.
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LICENSE #: 032873

DESIGN CONSULTANT:

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BROOKLYN NY, 11205
T. 718.484.3201

STRUCTURAL ENGINEER:

MEP ENGINEER:

MUNICIPAL CONSULTANT:

OWNER:

MOSHE SILBERSTIEN
917-488-4651
SILBER175@GMAIL.COM

LOCATION:

77 CLAY STREET
BROOKLYN NY 11222

SITE MAP

PROJECT:

NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:

DETAILS

DOB APPLICATION # :

#.....

DOB BSCAN :

SEAL AND SIGNATURE

DATE: 8/27/2014 12:44:49 PM
SCALE: As indicated
DRAWING BY: SW
DRAWING No.:

A-300 .00

SHEET 17OF 17

DOOR SCHEDULE

MARK	TYPE	SIZE		QUANTITY	Fire Rating	U FACTOR / SHGC	NOTES	Function
		WIDTH	HEIGHT					
D1	SINGLE - ENTRANCE - GLASS	3'-0"	8'-0"	1	1.5 HR	.33/.34	FPSC	Exterior
D2	DOUBLE - SLIDING - GLASS	5'-0"	8'-0"	13		.33/.34		Exterior
D3	SINGLE FLUSH	2'-0"	7'-0"	23				Interior
D4	SINGLE - FLUSH - APARTMENT DOOR W PEEPHOLE	3'-0"	7'-0"	14	1.5HR	.33/.34	FPSC	Interior
D5	SINGLE - FLUSH W VISION PANEL	3'-0"	7'-0"	4	1.5HR		FPSC	Interior
D6	SINGLE FLUSH	2'-10"	7'-0"	4				Interior
D8	SINGLE FLUSH	2'-8"	7'-0"	16				Interior
D9	FLUSH - DOUBLE DOOR	2'-0"	7'-0"	2	1.5HR		FPSC	Interior

WINDOW SCHEDULE

TYPE MARK	SIZE		MANUFACTURER	U FACTOR / SHGC	AIR LEAKAGE	NOTES	COUNT
	WIDTH	HEIGHT					
9	3'-0"	6'-0"					10
W1	4'-0"	5'-0"	PELLA	.33/.34	AIR LEAKAGE 0.10 CFM/SF		25
W3	1'-6"	8'-0"	PELLA	.33/.34	AIR LEAKAGE 0.10 CFM/SF	LOW -E / DOUBLE GLAZING	1
W4	4'-0"	1'-6"	PELLA	.33/.34	AIR LEAKAGE 0.10 CFM/SF	LOW -E / DOUBLE GLAZING	2

DIEGO AGUILERA ARCHITECTS, P.C.
DESIGN & ARCHITECTURE

DIEGO AGUILERA ARCHITECTS P.C.
97-40 62ND DRIVE. SUITE 4L
REGO PARK NY 11374
(718) 606 6008 - (718) 896 9432
DBAGUILERA@AOL.COM
LICENSE #: 032873

DESIGN CONSULTANT:

SAMUEL WIEDER + ASSOCIATES
146 SPENCER STREET, SUITE #3006
BROOKLYN NY, 11205
T. 718.484.3201

STRUCTURAL ENGINEER:

MEP ENGINEER:

MUNICIPAL CONSULTANT:

OWNER:

MOSHE SILBERSTIEN
917-488-4651
SILBER175@GMAIL.COM

LOCATION:

77 CLAY STREET
BROOKLYN NY 11222

SITE MAP

PROJECT:

NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:

DOOR & WINDOW SCHEDULES

DOB APPLICATION # :

#.....

DOB BSCAN :

SEAL AND SIGNATURE

DATE: 8/27/2014 12:44:49 PM
SCALE:
DRAWING BY: SW
DRAWING No.:

A-301 .00

ACCESSIBLITY BUILDING BLOCKS

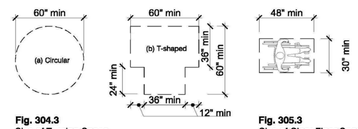


Fig. 304.3
Size of Turning Space

Fig. 305.3
Size of Clear Floor Space

1 | TURNING SPACE & CLEAR FLOOR SPACE / ICC/ANSI A11.1-2003 (P.8)

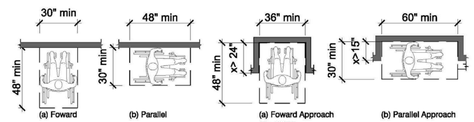


Fig. 305.5
Clear Floor Space (Position & Approach)

Fig. 305.7
Maneuvering Clearance in an Alcove

2 | FLOOR SURFACES ICC ANSI A117.1-2003 (P. 9)

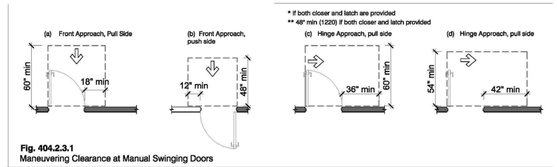


Fig. 404.2.3.1
Maneuvering Clearance at Manual Swinging Doors

10 | DOOR AND DOORWAYS ICC/ANSI A117.1 2003 (P.17-21)

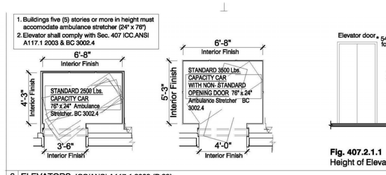


Fig. 407.2.1.1
Height of Elevator Call Buttons

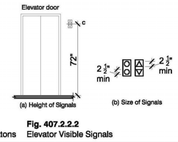


Fig. 407.2.2.2
Elevator Visible Signals

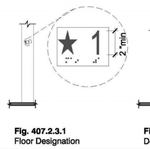


Fig. 407.2.3.1
Floor Designation

Fig. 407.2.3.2
Designation-Oriented Elevator Car Identification

6 | ELEVATORS ICC/ANSI A117.1 2003 (P.23)

ACCESSIBLE ROUTES REFERENCE

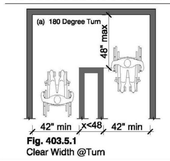
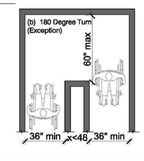


Fig. 403.5.1
Clear Width @Turn



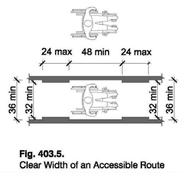
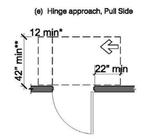
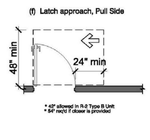


Fig. 403.5.
Clear Width of an Accessible Route

7 | CLEAR WIDTH ICC/ANSI A117.1 2003 (P.15-16)





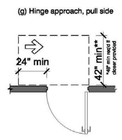


Fig. 404.2.3.1
Maneuvering Clearance @ Manual Swinging Doors

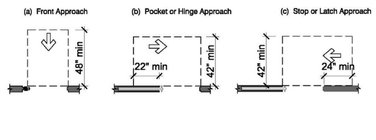


Fig. 404.2.3.2
Maneuvering Clearance @ Sliding & Folding Doors

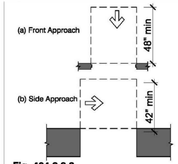


Fig. 404.2.3.3
Maneuvering Clearance at Doorways w/o Drs

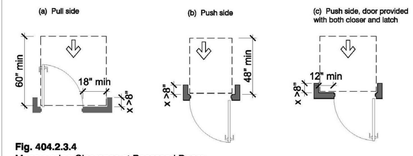


Fig. 404.2.3.4
Maneuvering Clearance at Recessed Doors

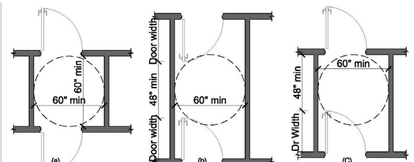
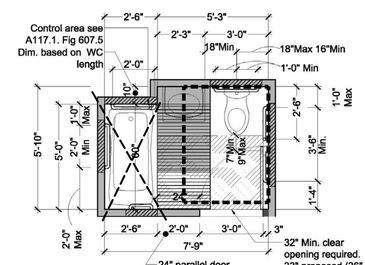


Fig. 404.2.3.5 Two Doors in a Series

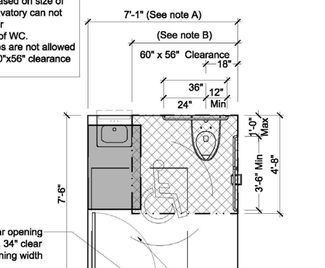
11 | CONTI. DOOR AND DOORWAYS ICC/ANSI A117.1 2003 (P.17-21)

BATHROOM / ACCESSIBLE TOILET ANALYSIS



TYP. BATHROOM PROPOSED @ APARTMENT UNITS
APPENDIX P (FRONT APPROACH)
CLEARANCE ANALYSIS & OTHER FEATURES FOR FUTURE ACCESSIBILITY

Notes
A. 7'1" value based on size of lavatory. Lavatory can not overlap clear floor space of WC.
B. Other fixtures are not allowed within the 60"x56" clearance for WC



ACCESSIBLE TOILET

Hatch Legend

- B.C. P102.6 2008 BC: Complying lavatory may overlap floor space at tub (B.C. P102.9.1) 30" x 60" (length of tub)
- 30" x 48" clear floor space for lavatory access (B.C. P102.6) also serves as 30" x 48" clear floor space beyond door swing (B.C. P.102.3)
- Reinforcement for grab bars. See dtl.
- Other fixtures are not allowed within the 60"x56" clearance for WC
- 42" min. perpendicular door manuevering clearance & 24" parallel door maneuvering clearance (B.C. P102.3)
- 66" X 48" water closet forward approach.

Notes:
1. Water Closet (WC): 28" max. length proposed for this bathroom size
2. Grab Bar: 18" future verticle grab bar. 30" from center of grab bar to rear wall. 39" min to 49" max A.F.F. (BC P102.8.3.1)
3. Toilet Paper Holder: 7" min -9" max from the outer edge of wc to the center of the toilet paper holder. 19" max from the finished floor (B.C. P102.8.6)
4. Medicine Cabinet: Bottom shelf shall not be higher that 44" A.F.F.
5. Mirror: Bottom of the mirror shall not be higher than 40" A.F.F. (B.C. P102.7)
6. Removable cabinet under Lavatory: Removable cabinet permitted under lavatory with restrictions (B.C. P 102.6)
   - -Cabinetry can be removed w/o removal or replacement of lavatory.
   - -The finish floor extends under such cabinet.
   - -The walls behind and surrounding cabinetry are finished.
   - -Max 25" knee clearance permitted (A117.1.308.3)

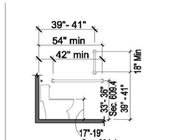


Fig. 604.2.5.1
ICC/ANSI A117.1-2003 (p.48)
Side Wall Grab Bar for Water Closet

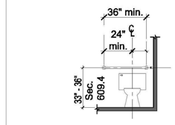


Fig. 604.2.5.2
ICC/ANSI A117.1-2003 (p. 48)
Rear Wall Grab Bar for Water Closet

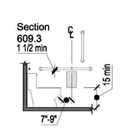
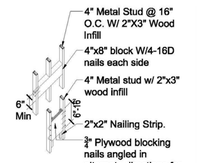


Fig. 604.7
ICC/ANSI A117.1-2003 (p. 49)
Dispenser Loc. (a) Below Grab Bar



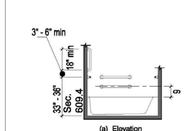
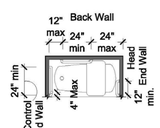


Fig. 607.4.2
ICC/ANSI A117.1-2003 (p.56)
Grab Bars for Bathtub w/o Permanent Seats



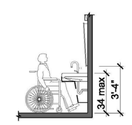


Fig. 606.3
ICC/ANSI A117.1-2003 (p. 53)
Height of Lavatories & Sinks

12 | TYP. BATHROOM PROPOSED @ APARTMENT UNITS & ACCESSIBLE TOILETS

DIEGO AGUILERA ARCHITECTS, P.C.
DESIGN & ARCHITECTURE

DIEGO AGUILERA ARCHITECTS P.C.
97-40 62ND DRIVE. SUITE 4L
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LICENSE #: 032873

DESIGN CONSULTANT:

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MEP ENGINEER:

MUNICIPAL CONSULTANT:

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LOCATION:

77 CLAY STREET
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SITE MAP

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ADA DETAILS

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A-302 .00

SHEET 8 OF 17

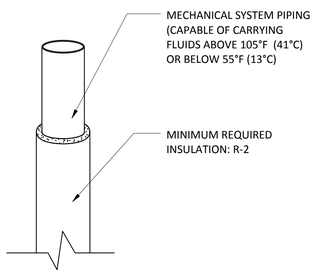
PLOT DATE: 10/13/2015 3:14 PM
AU_ACCESSIBILITY.dwg

ENERGY CODE TABULAR ANALYSIS
COMMERCIAL

NYCECC CITATION	Provision	Item Description	Proposed Design Value	Code Prescriptive Value	Supporting Documentation
CLIMATE ZONES, DESIGN CONDITIONS, MATERIALS, EQUIPMENT AND SYSTEMS					
COMMERCIAL BUILDING THERMAL ENVELOPE					
502.2	OPAQUE ASSEMBLIES				
502.1.2 or 502.2 (I)	Roof Assembly - Insulation	roof membrane and thermal insulation	General Roof and Bulkheads: 4 Ply Built-up roofing w/ 5" Min RIGID R20 INSULATION continuous insulation above deck R-38 BATT INSULATION BELOW DECK	Minimum R-38 continuous insulation	Roof Type: A-201 (BUILDING SECTION) A-300 (Details)
502.1.2 or 502.2 (I)	Walls Above Grade	EXTERIOR WALL 8" cmu walls /Solid BRICK 2" EIFS 3 1/2" METAL STUDS 5/8" GYP. BD.	EXTERIOR WALL R- 13, fiberglass batt insulation R -5, CNU MASS R-8 ,2" EIFS **R-26**	R-11.4ci	Exterior Wall: A-100, A-101, A-202, A-300
502 1.2 or 502.2 (1)	Below-grade Walls	Foundation wall: Concrete foundation wall with Thermal insualtion on ext. side	Foundation wall: 2" extruded insulation = R-8	R7.5cI	FOUNDATION WALL A-100, A-101, A-202, A-300
502 1.2 or 502.2 (1)	Slab-on-Gade Floors: Unheated Slabs	New slab on grade under proposed alteration.	Unheated slab not required to be insulated for commercial Use.	NR	N/A
502.3	**FENESTRATION**				
502.3	Vertical Fenestration, Metal Framing with or without thermal break U Value, SHGC, PF	new aluminum framed windows	window: U = 0.33, SHGC = 0.34	Window : U = 0.40, SHGC = 0.40	Vertical fenestration: A-201
502.3	glazed Doors, Metal Framing with or without thermal break U Value and SHGC	New aluminum framed glazed doors, Main entrance	Window Type : glass Doors U = 0.33, SHGC = 0.34	Window Types: Maximum U-Factor = 0.55 Maximum SHGC = 0.40	Vertical fenestration: A-200, A-201
502.4	AIR LEAKAGE				
502.4.1	window and door assemblies	aluminum framed windows	Window: Air leakage s0.10 cfm/SF	Maximum Air Leakage - 0.3 cfm/SF	Vertical fenestration: A-200 (Building Elevations)
502.4.2	Curtain wall, storefront glazing and commercial entrance doors.	New glazed entrance doors, Main Moor.	Commercial glazed swinging entrance doors and revolving doors = 1.0 cfm/sf of door area	Max Air Leakage Rates: Commercial glazed swinging entrance doors and revolving doors = 1.0 cfm/sf of door area	A-201
502.4.3	Continuous Air Barrier	Expandable spray-applied polyurethane foam sealant, continuous @ windo[At rough openings.	Expandable spray-applied polyurethane foam sealant, continuous @ window rough openings.	A continuous air barrier shall be installed: sealing all seams, openings and penetrations of the building and shall be sealed with caulking materials or closed with gasketing systems compatable with the construction materials and location.	A-201 (Building Elevations)
5024.4	Outdoor intakes and exhaust openings	New vents and air intakes.	All new vents and air intakes to be provided with class 1 motorized, leakage-rated damper with a max leakage rate of 4 cfm/sf at 1.0 in. wg.	Stair andshaft vents and other outdoor air intakes and exhaust openings Integral to the bldg envelope shall be equipped with not less than a class 1 lmotorized, leakage-rated damper with a max leakage rate of 4 cfm/sf at 1.0 in. [lg.	A-100
502.4.7	reccessed lighting.	Recessed luminaires in the thermal envelope to be weather sealed	Recessed luminaires in the roof ceiling assembly sealed to lcfm air movement	Recessed luminaires installed in the building thermal envelope shall be sealed to maximum air leakage 2cfm.	EN-100

NOTE:

TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH NEW YORK CITY ENERGY CONSTRUCTION CODE 2011 (NYCECC 2011)



2 **PIPING INSULATION DETAIL**

SCALE: 12" = 1'-0"

503.2.1 CALCULATION OF HEATING AND COOLING LOADS.

503.2.1 CALCULATION OF HEATING AND COOLING LOADS. DESIGN LOADS SHALL BE DETERMINED IN ACCORDANCE WITH THE PROCEDURES DESCRIBED IN THE ASHRAE/ACCA 183. HEATING AND COOLING LOADS SHALL BE ADJUSTED TO ACCOUNT FOR LOAD REDUCTIONS THAT ARE ACHIEVED WHEN ENERGY RECOVERY SYSTEMS ARE UTILIZED IN THE HVAC SYSTEM IN ACCORDANCE WITH THE ASHRAE HVAC SYSTEMS AND EQUIPMENT HANDBOOK.

HEATING AND COOLING EQUIPMENT AND SYSTEMS CAPACITY SHALL NOT EXCEED THE LOADS CALCULATED IN ACCORDANCE WITH SECTION 503.2.1. ECC 503.2.2& AS PER ASHRAE / ACCA 183

ENERGY CODE TABULAR ANALYSIS
COMMERCIAL

NYCECC CITATION	Provision	Item Description	Proposed Design Value	Code Prescriptive Value	Supporting Documentation
CLIMATE ZONES, DESIGN CONDITIONS, MATERIALS, EQUIPMENT AND SYSTEMS					
COMMERCIAL BUILDING MECHANICAL SYSTEMS					
503	**BUILDIING MECHANICAL SYSTEMS**				
TABLE 503.2.3(2)	PACKAGED TERMINAL AIR CONDITIONERS AND PACKAGED TERMINAL HEAT PUMPS	Split system	SEER 13.3	MINIMUM EFFICIENCY: SEER 13	P-100
503.2.4	HVAC SYSTEM CONTROLS	**503.2.4 HVAC SYSTEM CONTROLS.** EACH HEATING AND COOLING SYSTEM SHALL BE PROVIDED WITH THERMOSTATIC CONTROLS AS REQUIRED IN SECTION 503.2.4.1, 503.2.4.2, 503.2.4.3, 503.2.4.4, 503.4.1, 503.4.2, 503.4.3 OR 503.4.4. **503.2.4.1 THERMOSTATIC CONTROLS.** THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE CONTROLLED BY INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE. WHERE HUMIDIFICATION OR DEHUMIDIFICATION OR BOTH IS PROVIDED, AT LEAST ONE HUMIDITY CONTROL DEVICE SHALL BE PROVIDED FOR EACH HUMIDITY CONTROL SYSTEM. **503.2.4.1.1 HEAT PUMP SUPPLEMENTARY HEAT.** HEAT PUMPS HAVING SUPPLEMENTARY ELECTRIC RESISTANCE HEAT SHALL HAVE CONTROLS THAT, EXCEPT DURING DEFROST, PREVENT SUPPLEMENTARY HEAT OPERATION WHEN THE HEAT PUMP CAN MEET THE HEATING LOAD. **503.2.4.2 SET POINT OVERLAP RESTRICTION.** WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL PROVIDE A TEMPERATURE RANGE OR DEADBAND OF AT LEAST 5°F (2.8°C) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS CAPABLE OF BEING SHUT OFF OR REDUCED TO A MINIMUM. **503.2.4.3 OFF-HOUR CONTROLS.** EACH ZONE SHALL BE PROVIDED WITH THERMOSTATIC SETBACK CONTROLS THAT ARE CON TROLLED BY EITHER AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM. **503.2.4.3.1 THERMOSTATIC SETBACK CAPABILITIES.** THERMOSTATIC SETBACK CONTROLS SHALL HAVE THE CAPABILITY TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F (13°C) OR UP TO 85°F (29°C). **503.2.4.3.2 AUTOMATIC SETBACK AND SHUTDOWN CAPABILITIES.** AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS SHALL BE CAPABLE OF STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK AND RETAINING THEIR PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR AT LEAST 10 HOURS. ADDITIONALLY, THE CONTROLS SHALL HAVE A MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO 2 HOURS; A MANUALLY OPERATED TIMER CAPABLE OF BEING ADJUSTED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS; OR AN OCCUPANCY SENSOR. **503.2.4.4 SHUTOFF DAMPER CONTROLS**. BOTH OUTDOOR AIR SUPPLY AND EXHAUST DUCTS SHALL BE EQUIPPED WITH MOTORIZED DAMPERS THAT WILL AUTOMATICALLY SHUT WHEN THE SYSTEMS OR SPACES SERVED ARE NOT IN USE. **503.2.4.5 SNOW MELT SYSTEM CONTROLS.** SNOW- AND ICE-MELTING SYSTEMS, SUPPLIED THROUGH ENERGY SERVICE TO THE BUILDING, SHALL INCLUDE AUTOMATIC CONTROLS CAPABLE OF SHUTTING OFF THE SYSTEM WHEN THE PAVEMENT TEMPERATURE IS ABOVE 50°F (10°C) AND NO PRECIPITATION IS FALLING AND AN AUTOMATIC OR MANUAL CONTROL THAT WILL ALLOW SHUTOFF WHEN THE OUTDOOR TEMPERATURE IS ABOVE 40°F (4°C) SO THAT THE POTENTIAL FOR SNOW OR ICE ACCUMULATION IS NEGLIGIBLE		
503.2.7	DUCT AND PLENUM INSULATION AND SEALING	ALL SUPPLY AND RETURN AIR DUCTS AND PLENUMS SHALL BE INSULATED WITH A MINIMUM OF R-5 INSULATION WHEN LOCATED IN UNCONDITIONED SPACES AND WITH A MINIMUM OF R-8 INSULATION WHEN LOCATED OUTSIDE THE BUILDING. WHEN LOCATED WITHIN A BUILDING ENVELOPE ASSEMBLY, THE DUCT OR PLENUM SHALL BE SEPARATED FROM THE BUILDING EXTERIOR OR UNCONDITIONED OR EXEMPT SPACES BY A MINIMUM OF R-8 INSULATION.				
503.2.9.3	MANUALS	THE CONSTRUCTION DOCUMENTS SHALL REQUIRE THAT AN OPERATING AND MAINTENANCE MANUAL BE PROVIDED TO THE BUILDING OWNER BY THE MECHANICAL CONTRACTOR. THE MANUAL SHALL INCLUDE, AT LEAST, THE FOLLOWING: 1. EQUIPMENT CAPACITY (INPUT AND OUTPUT) AND REQUIRED MAINTENANCE ACTIONS. 2. EQUIPMENT OPERATION AND MAINTENANCE MANUALS. 3. HVAC SYSTEM CONTROL MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SEQUENCE DESCRIPTIONS. DESIRED OR FIELD-DETERMINED SET POINTS SHALL BE PERMANENTLY RECORDED ON CONTROL DRAWINGS, AT CONTROL DEVICES OR, FOR DIGITAL CONTROL SYSTEMS, IN PROGRAMMING COMMENTS. 4. A COMPLETE WRITTEN NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE.				
COMMERCIAL BUILDING SERVICE WATER HEATING					
504	**SERVICE WATER HEATING (Mandatory)**				
504.2	MINIMUM PERFORMANCE OF WATER HEATING EQUIPMENT	STORAGE WATER HEATERS,GAS	.70 EF	0.67 EF	P-100
504.3	TEMPERATURE CONTROLS.	SERVICE WATER HEATING EQUIPMENT SHALL BE PROVIDED WITH CONTROLS TO ALLOW A SET POINT OF 110°F (43°C) FOR EQUIPMENT SERVING DWELLING UNITS AND 90°F (32°C) FOR EQUIPMENT SERVING OTHER OCCUPANCIES. THE OUTLET TEMPERATURE OF LAVATORIES IN PUBLIC FACILITY REST ROOMS SHALL BE LIMITED TO 110°F (43°C).			
504.4	HEAT TRAPS.	WATER-HEATING EQUIPMENT NOT SUPPLIED WITH INTEGRAL HEAT TRAPS AND SERVING NON-CIRCULATING SYSTEMS SHALL BE PROVIDED WITH HEAT TRAPS ON THE SUPPLY AND DISCHARGE PIPING ASSOCIATED WITH THE EQUIPMENT.			
COMMERCIAL BUILDING ELECTRICAL AND POWER LIGHTING SYSTEMS					
505.2	**LIGHTING CONTROLS (MANDATORY)**				
505.2.4	Exterior lighting controls.	Daylight sensor controls provided for canopy and entry lighting. Manual overrides to be provided.	photosensors provided and programmed as per requirements	Lighting not designated for dusk-to dawn operation shall be controlled by either a combination of a photosensor and a time switch, or an astronomical time switch. Lighting designated for dusk to dawn operation shall be controlled by an astronomical time switch or photosensor. All time switches shall be capable of retaining programming and the time setting during loss of power for a period of at least 10 hrs.	see drawing A-200
505.4	Exit Signs	New LED exit signs to be provided.	N/A	Internally illuminated exit signs shall not exceed 5 watts per side.	N/A
505.5	**LIGHTING REQUIREMENTS (PRESCRIPTIVE)**				
505.5.1	Total connected interior lighting power	Total connected load of proposed interior lighting. Describe building area type, area and associated watts per square foot (w/sq.ft).	0.65 w/ sq.ft. Provided - ok (Total area -5,887 sq.ft.) (Total Watts = 3,820 W)	The total connected interior lighting power (watts) shall be the sum of the watts of all interior lighting equipment as determined in accordance with Sections 505.5.1.1 through 505.5.1.4. Multi-Family .7 (W/ft2)	EN-100
505.5.2 and 505.5.2	Interior lighting power	Interior lighting power for all building use types. 50% OF LAMPS IN PERMANENTLY INSTALLED FIXTURES MUST BE HIGH EFFICACY TYPE	3404 W 50% OF LAMPS IN PERMANENTLY INSTALLED FIXTURES MUST BE HIGH EFFICACY TYPE	The total interior lighting power (watts) is the sum of all interior lighting powers for all areas in the building covered in this permit. The interior lighting power is the floor area for each building area type listed in Table 505.5.2 times the value from Table 505.5.2 for that area.	EN -100
505.6, 505.6.2(1) and 505.6.2(2)	Exterior lighting (Mandatory).	Total connected load of proposed exterior lighting for lighting zone 2 (Main entrance door width= 3'-0")	60 W provided	total allowance calculated to 20 W /linear foot of door width as per table 505.6.2(2). 3'-0" x 20 W= 60 W allowed	A-200
505.6, 505.6.2(1) and 505.6.2(2)	Exterior building lighting power.	Exterior lighting is provided for Main Entrance at 20 W/linear foot of door width.	60 W provided	total allowance calculated to 60 W	Value provided in tabular analysis corroborated on lighting fixture tabulation.
505.7	Electrical energy consumption (Mandatory)	ELECTRICAL METERS	8 INDIVIDUAL ELECTRICAL METERS	In buildings having individual dwelling units, provisions shall be made to determine the electrical energy consumed by each tenant by separately metering individual dwelling units.	A-100

PROGRESS INSPECTIONS
FOR ENERGY CODE COMPLIANCE COMMERCIAL BUILDINGS

	INSPECTION/TEST	PERIODIC (MINIMUM)	REFERENCE STANDARD (SEE ECC CHAPTER 10) OR OTHER CRITERIA	ECC OR OTHER CITATION	COMPLIANCE
IIA	ENVELOPE INSPECTIONS				
IIA1	**Protection of exposed foundation insulation:** Insulation shall be visually inspected to verify proper protection where applied to the exterior of basement or cellar walls, crarwl-space walls and/or the perimeter of slab-on-grade floors.	As required during foundation work ond prior to backfill	Approved construction documents	303.2.1; ASHRAE 90.1 -5.8.1.1	
IIA2	**Insulation placement and R-values:** Installed insulation for each component of the conditioned space envelope and at junctions between components shall be visually inspected to ensure that the R-values are marked, that such R-values conform to the R-values identified in the construction documents and that the insulation is properly installed. Certifications for unmarked insulation shall be similarly visually inspected.	As required to verify continuous enclosure while walls, ceilings ond floors are open	Approved construction documents	303.1, 303.1.1, 303.1.2, 502.1, 502.2; ASHRAE 90.1 -5.5, 5.6 or 11; 5.8.1	
IIA3	**Fenestration thermal values and product ratings:** U-Factors and SHGC values of installed fenestration shall be visually inspected for conformance with the U-factors and SHGC values identified in the construction drawings by verifying the manufacturer's NFRC labels or, where not labeled, using the ratings in ECC Tobles 303.13(1), (2) ond (3). Where ASHRAE 90.1 is used, visible light transmittance values shall also be verified.	As required during installation	Approved construction documents; NFRC 100, NFRC 200	303.1, 303.13, 5023; ASHRAE 90.1 -5.5; 5.6 or 11; 58.2	
IIA4	**Fenestration and door assembly product ratings For air leakage:** Windows and sliding or swinging door assemblies, except site-built windows and/or doors, shall be visually inspected to verify that installed assemblies are listed and labeled by the manufacturer to the referenced standard. For curtain wall, storefront glazing, commercial entrance doors and revolving doors, the testing reports shall be reviewed to verify that the installed assembly complies with the standard cited in the approved plans.	As required during installation	NERO 400, AAMA/WDMA/CSA 101/I.S.2/A440 ASTM E283; ANSI/DASMA 105	502.4; ASHRAE 90.1 -5.43.2	
IIA5	**Fenestration areas**: Dimensions of windows, doors and skylights shall be verified by visual inspection.	Prior to final inspection	Approved construction documents	502.3; ASHRAE 90.1 -5.5.4, 5.6 or 11	
IIA6	**Sealing:** Openings and penetrations in the building envelope, including site-built fenestration and doors, shall be visually inspected to verify that a continuous air barrier around the envelope forms an air-tight enclosure. The progress inspector shall visually inspect to verify that materials and/or assemblies have been tested and meet the requirements of the respective standards, or that the building is tested ond meets the requirements of the standard, in accordance with the standard cited in the approved plans.	As required during construction	Approved construction documents	Approved construction documents; ASTM E2178, ASTM E2357 ASTM E167T, ASTM E779, ASTM E283.	
IIA9	**Building entrance vestibules:** Required entrance vestibules shall be visually inspected for proper operation.	Prior to final construction inspection	Approved construction documents		
IIB	**MECHANICAL AND SERVICE WATER HEATING INSPECTIONS - FILED UNDER SEPARATE APPLICATION**				
IIB3	HVAC & SERVICE WATER EQUIPMENT	Prior to final MECHANICAL and construction inspection	Approved construction documents	503 504	
IIB4	HVAC & SERVICE WATER SYSTEM CONTROLS	Prior to final MECHANICAL and construction inspection	Approved construction documents	503 504	
IIB5	DUCT PLENUM & PIPING INSULATION & SEALING	Prior to final MECHANICAL and construction inspection	Approved construction documents	503	
IIB6	DUCT LEAKAGE TESTING	Prior to final MECHANICAL and construction inspection	Approved construction documents	503	
IIC	**ELECTRICAL POWER AND LIGHTING SYSTEMS**				
IIC1	Electrical metering: The presence and operation of individual meters or other means of monitoring individual apartments shall be verified by visual inspection for all apartments.	Prior to final electrical and construction inspection	Approved construction documents	505.7	
IIC2	Lighting in dwelling units: Lamps in permanently installed lighting Fixtures shall be visually inspected to verify compliance with high-efficacy requirements.	Prior to final electrical and construction inspection	Approved construction documents	505.53	
IIC3	Interior lighting power: Installed lighting shall be verified for compliance with the lighting power allowonce by visual inspection of fixtures, lamps, ballasts and transformers.	Prior to final electrical and construction inspection	Approved construction documents	505.5; ASHRAE 90.1 -9.1, 9.2, 9.5, 9.6 IRCNY §101-07(c)(3)(v)(C)4	
IIC4	Exterior lighting: Installed lighting shall be verified for compliance with source efficacy and/or the lighting power allowance by visual inspection of fixtures, lamps, ballasts and relevant transformers.	Prior to final electrical and construction inspection	Approved construction documents, including control system narratives	505.6; ASHRAE 90.1 -9.4.4, 9.4.5; IRCNY §101-07(c)(3)(v) (C)4	
IIC5	Lighting controls: each type of required lighting controls, including: * occupant sensors * manual interior lighting controls *light reduction controls * automatic lighting shut-off * daylight zone controls * sleeping unit controls * exterior lighting controls shall be verified by visual inspection and tested for functionality and proper operation.	Prior to final electrical and construction inspection	Approved construction documents, including control system narratives	505.2, 505.2.2.2; ASHRAE 90.1 -9.4.1, 9.4.1.2 (AS MODIFIED BY SECTION ECC A102)	
IIC6	Exit signs: Installed exit signs shall be visually inspected to verify that the label indicates that they do not exceed maximum permitted wattage.	Prior to final electrical and construction inspection	Approved construction documents	505.4; ASHRAE 90.1 -9.4.3	
IIC7	Tandem wiring: Tandem wiring shall be tested for functionality.	Prior to final electrical and construction inspection	Approved construction documents	505.3; ASHRAE 90.1 -9.42	
ID1	MAINTENANCE INFORMATION	construction inspection	Approved construction documents		
IS2	PERMANENT CERTIFICATE	construction inspection	Approved construction documents		

DIEGO AGUILERA ARCHITECTS, P.C.
DESIGN & ARCHITECTURE

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STRUCTURAL ENGINEER:

MEP ENGINEER:

MUNICIPAL CONSULTANT:

OWNER:

MOSHE SILBERSTIEN
917-488-4651
SILBER175@GMAIL.COM

LOCATION:

77 CLAY STREET
BROOKLYN NY 11222

SITE MAP

PROJECT:

NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:

ENERGY ANALYSIS

DOB APPLICATION # :

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DOB BSCAN :

SEAL AND SIGNATURE

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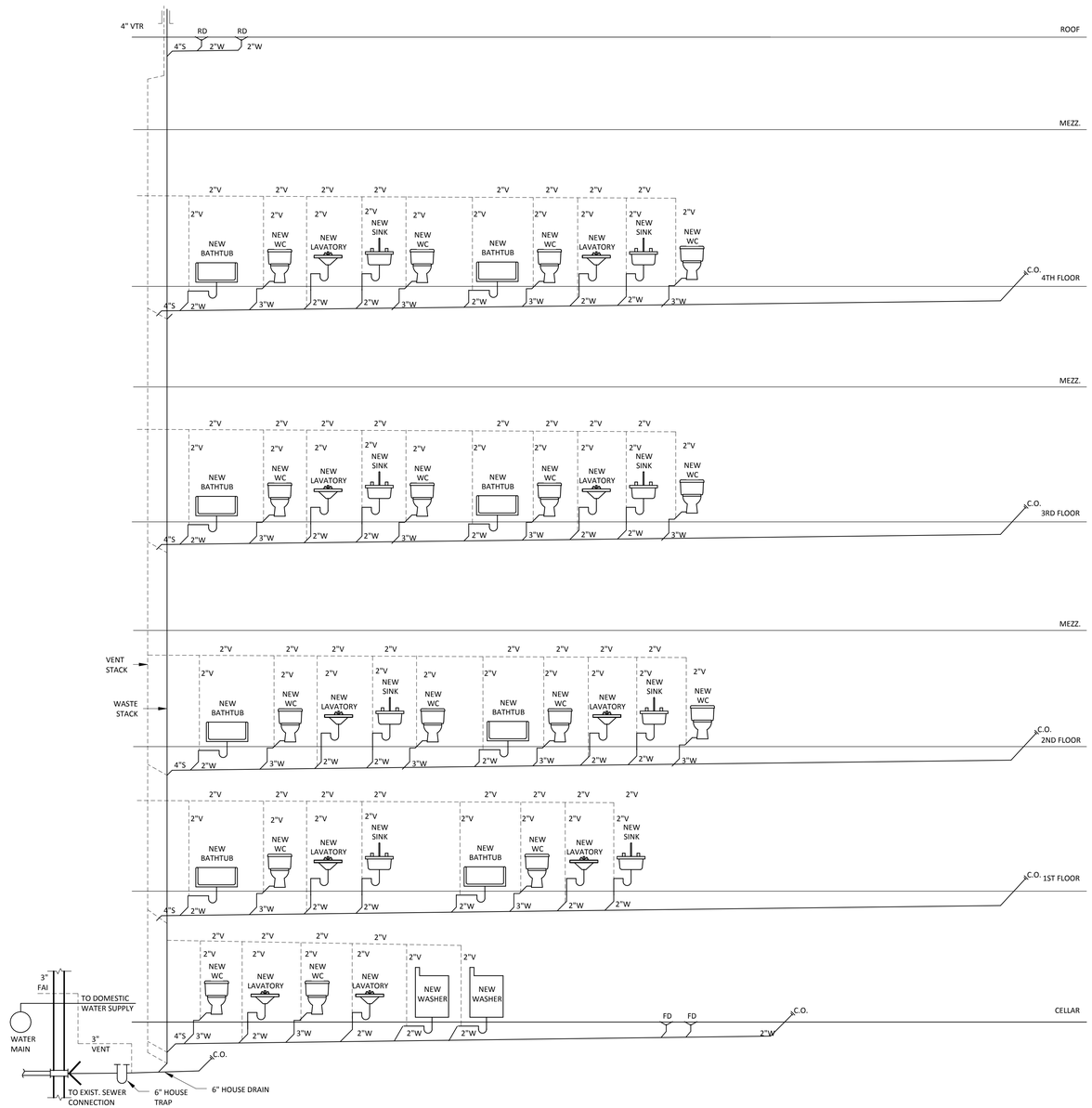

EQUIPMENT SCHEDULE							
QTY.	DESCRIPTION	MANUFACTURER	MODEL	CAPACITY	MEA #	SEER	EF.
8	ELECT. SPLIT UNIT	DAIKIN	4MXS32GVJU	32,000 BTU	384-04-E Vol.5	13	
9	GAS HWH	AO SMITH	VSX130361	50 GAL	25-05-E		

PLUMBING AND DRAINAGE NOTES

1. ALL PLUMBING AND GAS PIPING WORK SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF ARTICLE 16 AND REFERENCE STANDARD RS-16 OF THE NYC BUILDING CODE.

2. PLUMBING FIXTURES SHALL BE OF TYPE AND MANUFACTURE APPROVED FOR USE IN NEW YORK CITY, AND SHALL BEAR BS&A APPROVAL.

3. ALL GAS-FIRED EQUIPMENT TO BE A.G.A. OR M.E.A. APPROVED.

4. PLUMBING CONTRACTOR TO EXAMINE PROPOSED LAYOUT WITH REGARD TO EXISTING FIELD CONDITIONS, AND SHALL NOTIFY ARCHITECT OF ANY DISCREPANCIES BETWEEN ASSUMED FIELD CONDITIONS AND THOSE ENCOUNTERED DURING CONSTRUCTION. PLUMBING CONTRACTOR SHALL INFORM THE ARCHITECT OF ANY REVISIONS TO PLAN WHICH SHALL BE NECESSARY, BASED ON CONDITIONS UNCOVERED IN THE FIELD, IN ORDER TO INSTALL ALL FIXTURES, EQUIPMENT PIPING IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THE NYC BUILDING CODE.

5. PLUMBING CONTRACTOR SHALL ARRANGE AND OBTAIN INSPECTIONS AND REQUIRED SIGN-OFFS.

PLUMBING NOTES:
- FOLLOW ALL LOCAL & STATE PLUMBING CODES.
- PROVIDE A POSITIVE DRAIN & FLOW ON ALL PIPING & DRAINS.

1 **PLUMBING RISER DIAGRAM**
SCALE:N.T.S.

DIEGO AGUILERA ARCHITECTS, P.C.
DESIGN & ARCHITECTURE

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STRUCTURAL ENGINEER:

MEP ENGINEER:

MUNICIPAL CONSULTANT:

OWNER:

MOSHE SILBERSTIEN
917-488-4651
SILBER175@GMAIL.COM

LOCATION:

77 CLAY STREET
BROOKLYN NY 11222

SITE MAP

PROJECT:

NEW 4 STORY RESIDENTIAL BUILDING

DRAWING TITLE:

PLUMBING RISER DIAGRAM

DOB APPLICATION # :

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DOB BSCAN :

SEAL AND SIGNATURE

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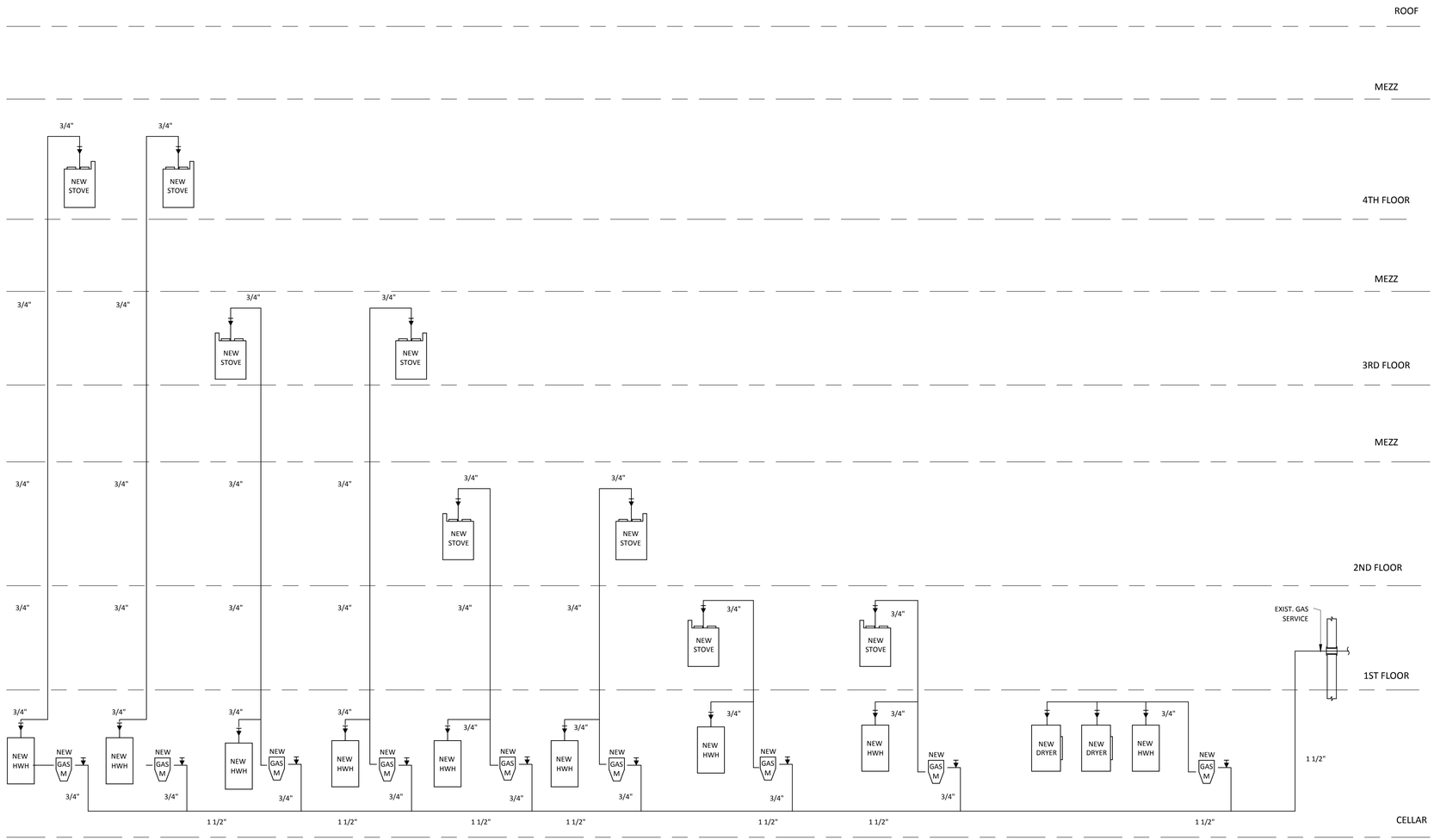

**** ALL FIXTURES ARE NEW UNLESS NOTED OTHERWISE .***

GAS PIPING NOTES

1. GAS APPLIANCES SHALL COMPLY WITH THE BOARD OF STANDARD & APPEALS RULES AND REGULATIONS .

2. SHUT - OFF VALVES SHALL BE PROVIDED AT EACH GAS FIXTURE.

3. THE GAS PIPING SYSTEM, SYSTEM TESTING AND APPLIANCE INSTALLATION SHALL BE REQUIRED AS PER P. 115.0 AND SECTION 26--1601.1 AND SECTION 26-1606.4.

4. ALL GAS SERVICE PIPING SHALL BE FITTED WITH A SERVICE LINE VALVE, THE VALVE LOCATED ON THE SUPPLY SIDE OF THE METER AND SERVICE REGULATOR, IF A SERVICE REGULATOR IS REQUIRED.

5. GAS SERVICE LINE LOCATED INSIDE OF THE BUILDING SHALL BE IN AN ACCESSIBLE LOCATION WITHIN TWO FEET OF THE POINT WHERE THE GAS SERVICE CONNECTION ENTERS THE BUILDING.

6. NO GAS SERVICE SHALL ENTER A STRUCTURE AT A HORIZONTAL DISTANCE OF LESS THAN 10 FEET FROM THE CELLAR TERMINATION OF A STAIRWAY, UNLESS SUCH SERVICE, METERS AND REGULATORS ARE SEPERATED FROM THE STAIRWAY TERMINATION BY A PERMANENT PARTITION HAVING A FIRE-RESISTANCE RATING OF AT LEAST ONE HOUR.

7. WHEN A STRUCTURE IS ERECTED ON FILL OR PILES, PROVISIONS SHALL BE MADE TO PREVENT POSSIBLE DAMAGE TO GAS SERVICE PIPING, CAUSED BY SETTLEMENT.

8. AN OUTSIDE GAS SERVICE LINE VALVE OR OTHER EMERGENCY SHUT-OFF DEVICE OR METHOD ACCEPTABLE TO THE COMMISSIONER OR FIRE COMMISSIONER SHALL BE INSTALLED IN EVERY GAS SERVICE PIPE OUTSIDE THE BUILDING.

9. THE INSTALLATION OF GAS SERVICE PIPING SHALL BE MADE IN ACCORDANCE WITH THE REQUIREMENT OF THE UTILITY CORPORATION PROVIDING SERVICE AS REGULATED BY PART 255, OF TITLE 16 OF THE OFFICIAL COMPILATION OF CODES, RULES AND REGULATIONS OF THE STATE OF NEW YORK. SUCH INSTALLATION SHALL ALSO MEET THE REQUIREMENT OF THE DEPARTMENT OF BUILDINGS.

10. GAS SERVICE PIPING OUTSIDE OF A STRUCTURE SHALL BE INSTALLED NOT LESS THAN 24 INCHES BELOW GRADE, EXCEPT THAT A LESSER DISTANCE NOT LESS THAN 18" INCHES MAY BE PERMITTED, PROVIDED THE PIPING IS ADEQUATELY PROTECTED IN ACCORDANCE WITH THE N.Y.C. BUILDING CODE. ANY PIPING THAT IS EXPOSED TO THE OUTDOOR TEMPERATURE OR INSTALLED UNDERGROUND LESS THAN TWO FEET SHALL BE PROTECTED AGAINST FROST, UNLESS THE UTILITY COMPANY CERTIFIES THAT DRY GAS IS BEING DISTRIBUTED.

11. GAS PIPE SHAFTS SHALL NOT BE LOCATED IN STAIRWAYS AND SHALL BE SEALED TO PREVENT ANY GAS LEAKAGE FROM THE SHAFT. THE SHAFT SHALL CONFORM TO HIGH HAZARD REQUIREMENTS, AND SHALL BE VENTED TO THE OPEN AIR AT THE TOP.

12. GAS METERS SHALL BE LOCATED AS NEAR AS PRACTICABLE TO THE POINT OF ENTRANCE OF THE SERVICE, AND WHERE POSSIBLE.

13. GAS METERS SHALL BE LOCATED IN THE CELLAR OR BASEMENT, UNLESS OTHERWISE PERMITTED BY THE COMMISSIONER.

14. GAS METERS SHALL BE ADEQUATELY PROTECTED AGAINST EXTREME COLD OR HEAT AND SHALL BE READILY ACCESSIBLE FOR READING AND INSPECTION.

1 **GAS RISER DIAGRAM**
SCALE: 1/4" = 1'-0"

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DESIGN & ARCHITECTURE

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GAS RISER DIAGRAM

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DOB BSCAN :

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ATTACHMENT B
CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Superb 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, Superb 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, Eric Ilijevich, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 341-2034.

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

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1808 MIDDLE COUNTRY ROAD
RIDGE, NY 11961
PH: 631.504.6000
FAX: 631.928.2780

brownfields@cityhall.nyc.gov.

Repositories. A document repository is maintained in online. Internet access to view OER's document repositories is available at public libraries. 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.

The library nearest the Site is:

Brooklyn Public Library - Bushwick Branch
340 Bushwick Avenue, Brooklyn, NY
Telephone Number: 718-602-1348
Hours of Operation:

Mon	closed
Tue	10:00AM - 6:00PM
Wed	10:00AM - 6:00PM
Thu	1:00PM - 8:00PM
Fri	10:00AM - 6:00PM
Sat	10:00AM - 5:00PM
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

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Environmental Business Consultants
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PH: 631.504.6000
FAX: 631.928.2780

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 Department 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 by SUPERB APARTMENTS LLC, reviewed and approved by OER prior to distribution and mailed by SUPERB 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:

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- **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.

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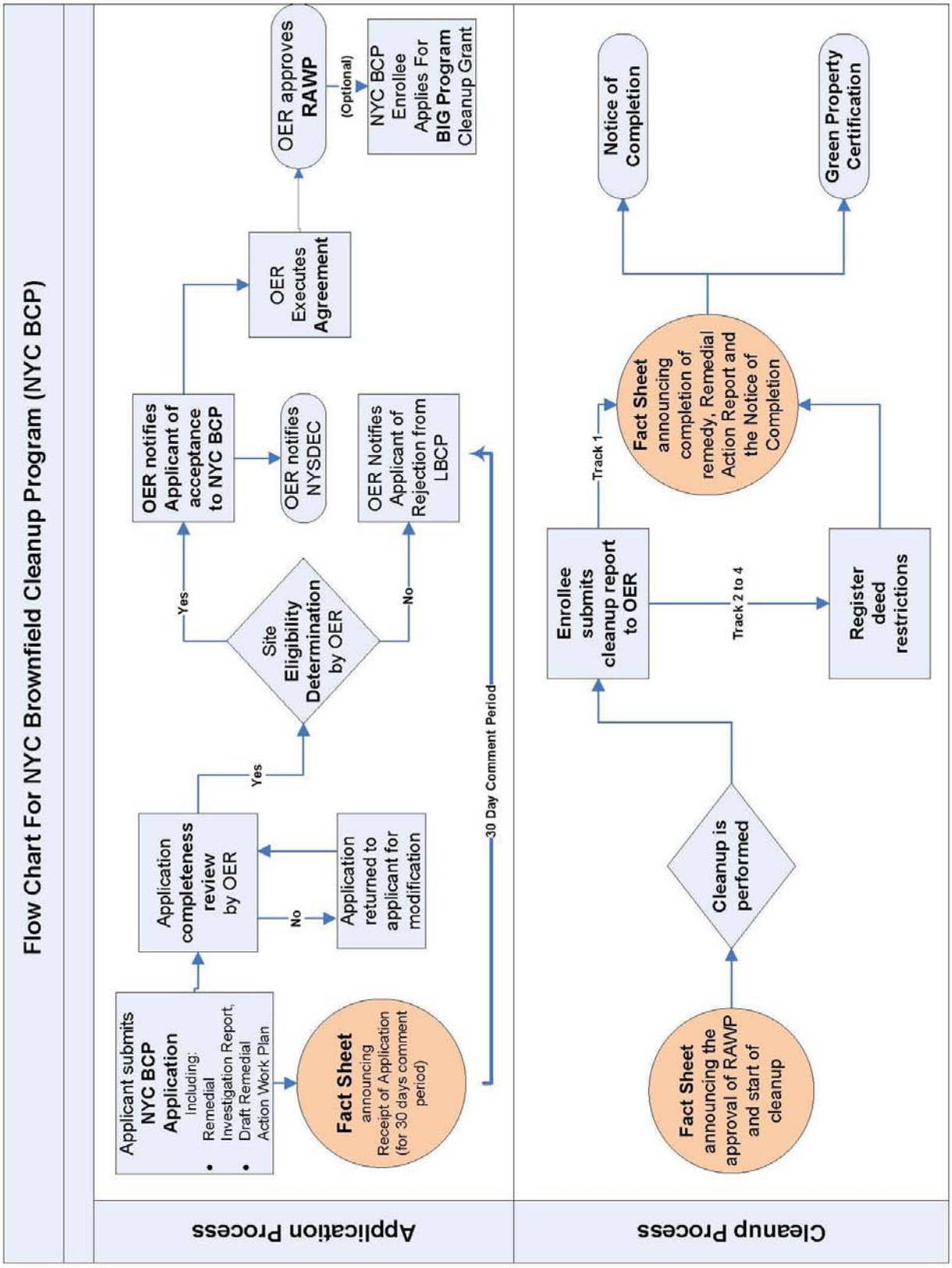

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ATTACHMENT C
SUSTAINABILITY STATEMENT

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

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be reported.

Paperless Voluntary Cleanup Program. SUPERB APARTMENTS LLC is participating in OER's Paperless Voluntary 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. SUPERB 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.

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ATTACHMENT D
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.

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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; and
- 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. The outbound truck transport route is shown on Figure 9.

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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 Brooklyn, 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).

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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 are listed in Table 1. '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.

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.

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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 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:

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- 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

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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.

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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.

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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.

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ATTACHMENT E
HEALTH AND SAFETY PLAN

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77 CLAY STREET
BROOKLYN, NEW YORK
Block 2483, Lot 62

CONSTRUCTION HEALTH AND SAFETY PLAN

MARCH 2015

Prepared By:

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961

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FIGURES

APPENDICES

STATEMENT OF COMMITMENT

This Construction Health and Safety Plan (CHASP) has been prepared to ensure that workers are not exposed to risks from hazardous materials during the Remedial Action at 77 Clay Street, Brooklyn, NY.

This CHASP, which applies to persons present at the site actually or potentially exposed to hazardous materials, describes emergency response procedures for actual and potential chemical hazards. This CHASP is also intended to inform and guide personnel entering the work area or exclusion zone. Persons are to acknowledge that they understand the potential hazards and the contents of this Health and Safety policy by signing off on receipt of their individual copy of the document. Contractors and suppliers are retained as independent contractors and are responsible for ensuring the health and safety of their own employees.

1.0 INTRODUCTION AND SITE ENTRY REQUIREMENTS

This document describes the health and safety guidelines developed by Environmental Business Consultants (EBC) for the planned Remedial Action at 77 Clay Street, New York, NY to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous materials or wastes during remedial activities. In accordance with the Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.120 Hazardous Waste Operations and Emergency Response Final rule, this CHASP, including the attachments, addresses safety and health hazards related to excavation, loading and other soil disturbance activities and is based on the best information available. The CHASP may be revised by EBC at the request of the developer and/or a regulatory agency upon receipt of new information regarding site conditions. Changes will be documented by written amendments signed by EBC's project manager, site safety officer and/or the EBC health and safety consultant.

1.1 Training Requirements

Personnel entering the exclusion zone or decontamination zone are required to be certified in health and safety practices for hazardous waste site operations as specified in the Federal OSHA Regulations CFR 1910.120e (revised 3/6/90).

Paragraph (e - 3) of the above referenced regulations requires that all on-site management personnel directly responsible for or who supervise employees engaged in hazardous waste operations, must initially receive 8 hours of supervisor training related to managing hazardous waste work.

Paragraph (e - 8) of the above referenced regulations requires that workers and supervisors receive 8 hours of refresher training annually on the items specified in Paragraph (e-1) and/or (e-3).

Additionally all on-site personnel must receive adequate site-specific training in the form of an on-site Health and Safety briefing prior to participating in field work with emphasis on the following:

- Protection of the adjacent community from hazardous vapors and / or dust which may be released during intrusive activities.
- Identification of chemicals known or suspected to be present on-site and the health effects and hazards of those substances.
- The need for vigilance in personnel protection, and the importance of attention to proper use, fit and care of personnel protective equipment.
- Decontamination procedures.
- Site control including work zones, access and security.
- Hazards and protection against heat or cold.
- The proper observance of daily health and safety practices, such as entry and exit of work zones and site. Proper hygiene during lunch, break, etc.
- Emergency procedures to be followed in case of fire, explosion and sudden release of hazardous gases.

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Health and Safety meetings will be conducted on a daily basis and will cover protective clothing and other equipment to be used that day, potential and chemical and physical hazards, emergency procedures, and conditions and activities from the previous day.

1.2 Medical Monitoring Requirements

Field personnel and visitors entering the exclusion zone or decontamination zone must have completed appropriate medical monitoring required under OSHA 29 CFR 1910.120(f) if respirators or other breathing related PPE is needed. Medical monitoring enables a physician to monitor each employee's health, physical condition, and his fitness to wear respiratory protective equipment and carry out on-site tasks.

1.3 Site Safety Plan Acceptance, Acknowledgment and Amendments

The project superintendent and the site safety officer are responsible for informing personnel (EBC employees and/or owner or owners representatives) entering the work area of the contents of this plan and ensuring that each person signs the safety plan acknowledging the on-site hazards and procedures required to minimize exposure to adverse effects of these hazards. A copy of the Acknowledgement Form is included in **Appendix A**.

Site conditions may warrant an amendment to the CHASP. Amendments to the HASP are acknowledged by completing forms included in **Appendix B**.

1.4 Key Personnel - Roles and Responsibilities

Personnel responsible for implementing this Health and Safety Plan are:

Name	Title	Address	Contact Numbers
Kimberly Somers	EBC – Project Manager	1808 Middle Country Rd Ridge, NY 11961	(631) 504-6000
Kimberly Somers	Health & Safety Manager	1808 Middle Country Rd Ridge, NY 11961	(631) 504-6000
Kevin Waters	Site Safety Officer	1808 Middle Country Rd Ridge, NY 11961	(631) 504-6000

The project manager is responsible for overall project administration and, with guidance from the site safety officer, for supervising the implementation of this CHASP. The site safety officer will conduct daily (tail gate or tool box) safety meetings at the project site and oversee daily safety issues. Each subcontractor and supplier (defined as an OSHA employer) is also responsible for the health and safety of its employees. If there is any dispute about health and safety or project activities, on-site personnel will attempt to resolve the issue. If the issue cannot be resolved at the site, then the project manager will be consulted.

The site safety officer is also responsible for coordinating health and safety activities related to hazardous material exposure on-site. The site safety officer is responsible for the following:

1. Educating personnel about information in this CHASP and other safety requirements to

be observed during site operations, including, but not limited to, decontamination procedures, designation of work zones and levels of protection, air monitoring, fit testing, and emergency procedures dealing with fire and first aid.

2. Coordinating site safety decisions with the project manager.

3. Designating exclusion, decontamination and support zones on a daily basis.

4. Monitoring the condition and status of known on-site hazards and maintaining and implementing the air quality monitoring program specified in this CHASP.

5. Maintaining the work zone entry/exit log and site entry/exit log.

6. Maintaining records of safety problems, corrective measures and documentation of chemical exposures or physical injuries (the site safety officer will document these conditions in a bound notebook and maintain a copy of the notebook on-site).

The person who observes safety concerns and potential hazards that have not been addressed in the daily safety meetings should immediately report their observations/concerns to the site safety officer or appropriate key personnel.

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2.0 SITE BACKGROUND AND SCOPE OF WORK

The Site is located at 77 Clay Street in the Greenpoint section of Brooklyn, New York, and is currently identified as Block 2483, Lot 62 on the New York City Tax Map. Figure 1 shows the Site location. Lot 62 is a rectangular shaped lot that includes of 25 feet of street frontage on Clay Street and extends100 feet deep for a total area of 2,500 sf. The Site is located on the north side of Clay Street, between Manhattan Avenue and McGuinness Boulevard. The Site is bordered by mixed-use buildings to the west; an undeveloped lot to the east; parking to the north; and Clay Street to the south. A map of the site boundary is shown on Figure 2.

The Site is improved with one three-story residential building with a full basement and rear yard. The building is currently vacant.

The proposed future use of the Site will consist of developing the lot with a new 4□story apartment building with a full cellar level. The cellar level will cover 65% of the lot, leaving a 875ft2 rear courtyard. The cellar level will consist of a mechanical room, two open cellar areas (not to be used for living or sleeping rooms), a tenant laundry room, two bathrooms, and three stairwells. Floors 1 through 4 will consist of residential apartments and tenant corridors. The cellar will require the excavation to a depth of approximately 10 feet below grade with additional excavation of approximately 1 ft for the rear at-grade courtyard. Therefore, an estimated 633 cubic yards (950 tons) of soil will require excavation for the new building's cellar.

Layout of the redevelopment plans for the cellar and first floors are presented in Figure 3. The current zoning designation is M1-2 / R6A. The proposed use is consistent with existing zoning for the property.

2.1 Previous Investigations

2.1.1 Phase II Subsurface Investigation Report (EBC January 2015)

A Phase I screening was competed by EBC in 2014. The following Site history was established based on historic Sanborn maps:

A Phase I Environmental Site Assessment was competed by EBC in September 2014. The following Site history was established based on historic Sanborn maps:

The Site was developed prior to 1887 with what appears to be the existing three-story structure. At this time it was used as a paint shop. In 1905, three storage buildings were added along the west property line with a fourth located at the rear of the property; and the main building is labeled as a store. The building continues in this configuration through 1942. By 1951, two of the west storage sheds and the rear shed appear to have been removed; the property remains labeled as a store. Sometime between 1951 and 1954, the property was converted to all residential use. Between 1965 and 1978 the remaining western shed appears to have been expanded to the entire width of the property. The property remains in this configuration through the present time.

The property was assigned an E-designation (E-138) for Hazmat during the Greenpoint-

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Williamsburg rezoning action completed by the City in May 2005.

A RIR investigation was completed for the site and consisted of:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed 3 soil borings across the Site, and collected 5 soil samples and one duplicate sample for chemical analysis from the soil borings to evaluate soil quality;
3. Installed 2 groundwater monitoring wells throughout the Site and collected 2 groundwater samples and one duplicate groundwater sample for chemical analysis to evaluate groundwater quality; and
4. Installed 3 soil gas implants (including 1 subslab) and collected 3 soil gas samples for chemical analysis.

Summary of Environmental Findings

1. The elevation of the Site is approximately 12 feet.
2. Depth to groundwater is estimated to be approximately 9 feet below sidewalk grade.
3. Groundwater flow is generally east/northeast.
4. Depth to bedrock is at the Site is greater than 100 feet.
5. The stratigraphy of the Site consists of historic fill material to depths as great as 4 feet, underlain by native brown silty sand.
6. Soil/fill samples results were compared to NYSDEC Unrestricted Use Soil Cleanup Objectives (Track 1) and Restricted Residential Use Soil Cleanup Objectives (Track 2) as presented in 6NYCRR Part 375-6.8 and CP51. Soil/fill samples detected no PCBs in any of the shallow or deep soil samples. VOCs were detected in both shallow and deep soil samples, but at concentrations below Unrestricted Use SCOs and Restricted Residential Use SCOs. SVOCs were detected in shallow soils, including benz(a)anthracene (4,500 µg/kg), benzo(a)pyrene (3,700 µg/kg), benzo(b)fluoranthene (4,600 µg/kg), chrysene (4,800 µg/kg), dibenzo(a)anthracene (650 µg/kg), and indeno(1,2,3-cd)pyrene (2,400 µg/kg) above Restricted Residential Use SCOs; and chromium (max. of 101 µg/kg), copper (max. of 157 µg/kg), nickel (30.1 µg/kg) and zinc (max. of 783 µg/kg) above Unrestricted Use SCOs. One SVOC, diethyl phthalate, was detected in one deeper soil sample, below both the Restricted Residential Use SCO and Unrestricted Use SCO. Several metals were detected in shallow soils, including arsenic (22.6 mg/kg), barium (386 mg/kg), cadmium (2.64 mg/kg), lead (916 mg/kg) and mercury (2.33 mg/kg) above Restricted Residential Use SCOs; and chromium (40.3 µg/kg), copper (max. of 157 µg/kg), nickel (30.1 µg/kg) and zinc (max. of 783 µg/kg) above Unrestricted Use SCOs. One metal, chromium (101 µg/kg) was detected in one deeper soil sample above Unrestricted Use SCO. Pesticides including 4,4-DDE (13 µg/kg) and 4,4-DDT (20 µg/kg) were detected above Restricted Residential Use SCO in one shallow soils sample. Pesticides detected in deeper soils include 4,4-DDE (490 µg/kg) and 4,4-DDT (20 µg/kg), 4,4-DDD (14 µg/kg) and dieldrin (27 µg/kg) at levels exceeding Unrestricted Use SCOs. Overall, the soil results were consistent with data identified at sites with historic

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fill material in NYC. Deeper soils were found to contain elevated levels of chromium and pesticides.

7. Groundwater samples results were compared to New York State 6NYCRR Part 703.5 Class GA groundwater quality standards (GQS). Groundwater samples showed no Pesticides or PCBs at detectable concentrations. One VOC, acetone, was detected above GQS in both groundwater samples. Several SVOCs were detected above GQS, including benzo(a)anthracene (max. of 0.08 µg/L), benzo(a)pyrene (0.06 µg/L), benzo(b)fluoranthene (0.08 µg/L), benzo(k)fluoranthene (0.04 µg/L), chrysene (0.07 µg/L), and indeo(1,2,3-cd)pyrene (0.03 µg/L). Several metals were identified, but only magnesium (35.2 mg/L), manganese (max of 0.862 mg/L) and sodium (32.8 mg/L) exceeded their respective GQS in groundwater samples.
8. Soil vapor results collected during the RI were compared to the compounds listed in Vapor Intrusion Matrices in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion, dated October 2006. Total concentrations of petroleum-related VOCs (BTEX) ranged from 25.17 µg/m3 to 82.99 µg/m3. The CVOC trichloroethylene (TCE) was not detected in any of the soil gas samples. Tetrachloroethylene (PCE) was detected in all three soil gas samples ranging in concentration from 0.271 µg/m3 to 0.678 µg/m3. Carbon tetrachloride was detected in one soil gas sample at a concentration of 0.629 µg/m3. 1,1,1-trichloroethane was not detected in any of the three soil gas samples. The PCE concentrations are below the monitoring level ranges established within the State NYSDOH soil vapor guidance matrix.

The report recommended specific management and handling of soils excavated during construction and proper off-site disposal of this material including:

- Visual separation of the historic fill and native soil layer while excavating for the new building(s).
- Proper disposal of excavated fill materials at a permitted disposal facility.
- Pre-classified in-situ sampling or excavated stockpile sampling as required to properly classify the materials and at intervals specified by the disposal facility.
- Installation of a vapor barrier beneath the proposed building's slab unless this portion of the Site were to remain open or if it were to be used for parking.

2.2 Redevelopment Plans

The proposed future use of the Site will consist of developing the lot with a new 4□story apartment building with a full cellar level. The cellar level will cover 65% of the lot, leaving a 875ft2 rear courtyard. The cellar level will consist of a mechanical room, two open cellar areas (not to be used for living or sleeping rooms), a tenant laundry room, two bathrooms, and three stairwells. Floors 1 through 4 will consist of residential apartments and tenant corridors. The cellar will require the excavation to a depth of approximately 10 feet below grade with additional excavation of approximately 1 ft for the rear at-grade courtyard. Therefore, an estimated 633 cubic yards (950 tons) of soil will require excavation for the new building's cellar.

The current zoning designation is M1-2 / R6A. The proposed use is consistent with existing

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zoning for the property.

The building will cover the front 65 feet of the lot and will have a full height basement level beneath the entire building footprint and will require excavation of the 65 % of the lot to a depth of at least 10 feet below grade. A rear yard is planned for the Site and will be approximately 35 x 25 feet. The rear yard will be excavated to a depth of 1 feet. Therefore, an estimated 633 cubic yards (950 tons) of soil will require excavation for the new building's cellar. The water table is expected at approximately 9 feet below grade surface (bgs), and will be encountered during excavation.

2.3 Description of Remedial Action

Site activities included within the Remedial Action that are included within the scope of this HASP include the following:

- Visual separation of the historic fill and native soil layer while excavating for the new building(s).
- Proper disposal of excavated fill materials at a permitted disposal facility.
- Pre-classified in-situ sampling or excavated stockpile sampling as required to properly classify the materials and at intervals specified by the disposal facility.

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3.0 HAZARD ASSESSMENT

This section identifies the hazards associated with the proposed scope of work, general physical hazards that can be expected at most sites; and presents a summary of documented or potential chemical hazards at the site. Every effort must be made to reduce or eliminate these hazards. Those that cannot be eliminated must be guarded against using engineering controls and/or personal protective equipment.

3.1 Physical Hazards

3.1.1 Tripping Hazards

An area of risk associated with on-site activities are presented by uneven ground, concrete, curbstones or equipment which may be present at the site thereby creating a potential tripping hazard. During intrusive work, care should be taken to mark or remove any obstacles within the exclusion zone.

3.1.2 Climbing Hazards

During site activities, workers may have to work on excavating equipment by climbing. The excavating contractor will conform with any applicable NIOSH and OSHA requirements or climbing activities.

3.1.3 Cuts and Lacerations

Field activities that involve excavating activities usually involve contact with various types of machinery. A first aid kit approved by the American Red Cross will be available during all intrusive activities.

3.1.4 Lifting Hazards

Improper lifting by workers is one of the leading causes of industrial injuries. Field workers in the excavation program may be required to lift heavy objects. Therefore, all members of the field crew should be trained in the proper methods of lifting heavy objects. All workers should be cautioned against lifting objects too heavy for one person.

3.1.5 Utility Hazards

Before conducting any excavation, the excavation contractor will be responsible for locating and verifying all existing utilities at each excavation.

3.1.6 Traffic Hazards

All traffic, vehicular and pedestrian, shall be maintained and protected at all times consistent with local, state and federal agency regulations regarding such traffic and in accordance with NYCDOT guidelines. The excavation contractor shall carry on his operations without undue interference or delays to traffic. The excavation contractor shall furnish all labor, materials, guards, barricades, signs, lights, and anything else necessary to maintain traffic and to protect his work and the public, during operations.

3.2 Work in Extreme Temperatures

Work under extremely hot or cold weather conditions requires special protocols to minimize the chance that employees will be affected by heat or cold stress.

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3.2.1 Heat Stress

The combination of high ambient temperature, high humidity, physical exertion, and personal protective apparel, which limits the dissipation of body heat and moisture, can cause heat stress.

The following prevention, recognition and treatment strategies will be implemented to protect personnel from heat stress. Personnel will be trained to recognize the symptoms of heat stress and to apply the appropriate treatment.

1. Prevention
    a. Provide plenty of fluids. Available in the support zone will be a 50% solution of fruit punch and water or plain water.
    b. Work in Pairs. Individuals should avoid undertaking any activity alone.
    c. Provide cooling devices. A spray hose and a source of water will be provided to reduce body temperature, cool protective clothing and/or act as a quick-drench shower in case of an exposure incident.
    d. Adjustment of the work schedule. As is practical, the most labor-intensive tasks should be carried out during the coolest part of the day.

2. Recognition and Treatment
    a Heat Rash (or prickly heat):
        Cause: Continuous exposure to hot and humid air, aggravated by chafing clothing.
        Symptoms: Eruption of red pimples around sweat ducts accompanied by intense itching and tingling.
        Treatment: Remove source or irritation and cool skin with water or wet cloths.

    b. Heat Cramps (or heat prostration)
        Cause: Profuse perspiration accompanied by inadequate replenishment of body water and electrolytes.
        Symptoms: Muscular weakness, staggering gait, nausea, dizziness, shallow breathing, pale and clammy skin, approximately normal body temperature.
        Treatment: Perform the following while making arrangement for transport to a medical facility. Remove the worker to a contamination reduction zone. Remove protective clothing. Lie worker down on back in a cool place and raise feet 6 to 12 inches. Keep warm, but loosen all clothing. If conscious, provide sips of salt-water solution, using one teaspoon of salt in 12 ounces of water. Transport to a medical facility.
    c. Heat Stroke
        Cause: Same as heat exhaustion. This is also an extremely serious condition.
        Symptoms: Dry hot skin, dry mouth, dizziness, nausea, headache, rapid pulse.
        Treatment: Cool worker immediately by immersing or spraying with cool water or sponge bare skin after removing protective clothing. Transport to hospital.

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3.2.2 Cold Exposure

Exposure to cold weather, wet conditions and extreme wind-chill factors may result in excessive loss of body heat (hypothermia) and /or frostbite. To guard against cold exposure and to prevent cold injuries, appropriate warm clothing should be worn, warm shelter must be readily available, rest periods should be adjusted as needed, and the physical conditions of on-site field personnel should be closely monitored. Personnel and supervisors working on-site will be made aware of the signs and symptoms of frost bite and hypothermia such as shivering, reduced blood pressure, reduced coordination, drowsiness, impaired judgment, fatigue, pupils dilated but reactive to light and numbing of the toes and fingers.

3.3 Chemical Hazards

"Urban fill" materials, present throughout the New York City area typically contain elevated levels of semi-volatile organic compounds and metals. These "contaminants" are not related to a chemical release occurring on the site, but are inherent in the reworked fill material in the area which contains ash and bits of tar and asphalt. Considering the previous sampling results and the past and present use of the site, the following compounds are considered for the site as potential contaminants: benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, indeno(1,2,3-c,d)pyrene, cadmium, chromium, copper, lead, mercury and zinc.

The primary routes of exposure to these contaminants are inhalation, ingestion and absorption.

Appendix C includes information sheets for suspected chemicals that may be encountered at the site.

3.3.1 Respirable Dust

Dust may be generated from vehicular traffic and/or excavation activities. If visible observation detects elevated levels of dust, a program of wetting will be employed by the site safety officer. If elevated dust levels persist, the site safety office will employ dust monitoring using a particulate monitor (Miniram or equivalent). If monitoring detects concentrations greater than 150 µg/m3 over daily background, the site safety officer will take corrective actions as defined herein, including the use of water for dust suppression and if this is not effective, requiring workers to wear APRs with efficiency particulate air (HEPA) cartridges.

Absorption pathways for dust and direct contact with soils or groundwater will be mitigated with the implementation of latex gloves, hand washing and decontamination exercises when necessary.

3.3.2 Dust Control and Monitoring During Earthwork

Dust generated during excavation activities or other earthwork may contain contaminants identified in soils at the site. Dust will be controlled by wetting the working surface with water. Calcium chloride may be used if the problem cannot be controlled with water. Air monitoring and dust control techniques are specified in a site specific Dust Control Plan (if applicable). Site workers will not be required to wear APR's unless dust concentrations are consistently over 150 $\mu g/m^3$ over site-specific background in the breathing zone as measured by a dust monitor unless the site safety officer directs workers to wear APRs. The site safety officer will use visible dust as an indicator to implement the dust control plan.

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3.3.3 Organic Vapors

Elevated levels of VOCs were detected in both soil and soil vapor samples collected during previous investigations at the site. Therefore, excavation activities may cause the release of organic vapors to the atmosphere. The site safety officer will periodically monitor organic vapors with a Photoionization Detector (PID) during excavation activities to determine whether organic vapor concentrations exceed action levels shown in Section 5 and/or the Community Air Monitoring Plan.

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4.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) shall be selected in accordance with the site air monitoring program, OSHA 29 CFR 1910.120(c), (g), and 1910.132. Protective equipment shall be NIOSH approved and respiratory protection shall conform to OSHA 29 CFR Part 1910.133 and 1910.134 specifications; head protection shall conform to 1910.135; eye and face protection shall conform to 1910.133; and foot protection shall conform to 1910.136. The only true difference among the levels of protection from D thru B is the addition of the type of respiratory protection. **It is anticipated that work will be performed in Level D PPE.**

4.1 Level D

Level D PPE shall be donned when the atmosphere contains no known hazards and work functions preclude splashes, immersion, or the potential for inhalation of, or contact with, hazardous concentrations of harmful chemicals. Level D PPE consists of:

- standard work uniform, coveralls, or tyvek, as needed;
- steel toe and steel shank work boots;
- hard hat;
- gloves, as needed;
- safety glasses;
- hearing protection;
- equipment replacements are available as needed.

4.2 Level C

Level C PPE shall be donned when the concentrations of measured total organic vapors in the breathing zone exceed background concentrations (using a portable OVA, or equivalent), but are less than 5 ppm. The specifications on the APR filters used must be appropriate for contaminants identified or expected to be encountered. Level C PPE shall be donned when the identified contaminants have adequate warning properties and criteria for using APR have been met. Level C PPE consists of:

- chemical resistant or coated tyvek coveralls;
- steel-toe and steel-shank workboots;
- chemical resistant overboots or disposable boot covers;
- disposable inner gloves (surgical gloves);
- disposable outer gloves;
- full face APR fitted with organic vapor/dust and mist filters or filters appropriate for the identified or expected contaminants;
- hard hat;
- splash shield, as needed; and,
- ankles/wrists taped with duct tape.

The site safety officer will verify if Level C is appropriate by checking organic vapor concentrations using compound and/or class-specific detector tubes.

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- chemical resistant coveralls;
- steel-toe and steel-shank workboots;
- chemical resistant overboots or disposable boot covers;
- disposable inner gloves;
- disposable outer gloves;
- hard hat; and,
- ankles/wrists taped.

The exact PPE ensemble is decided on a site-by-site basis by the Site Safety Officer with the intent to provide the most protective and efficient worker PPE.

4.3 Activity-Specific Levels of Personal Protection

The required level of PPE is activity-specific and is based on air monitoring results (Section 4.0) and properties of identified or expected contaminants. **It is expected that site work will be performed in Level D.** If air monitoring results indicate the necessity to upgrade the level of protection engineering controls (i.e. Facing equipment away from the wind and placing site personnel upwind of drilling locations, active venting, etc.) will be implemented before requiring the use of respiratory protection.

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5.0 AIR MONITORING AND ACTION LEVELS

29 CFR 1910.120(h) specifies that monitoring shall be performed where there may be a question of employee exposure to hazardous concentrations of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment so that employees are not exposed to levels which exceed permissible exposure limits, or published exposure levels if there are no permissible exposure limits, for hazardous substances.

5.1 Air Monitoring Requirements

If excavation work is performed, air will be monitored for VOCs with a portable ION Science 3000EX photoionization detector, or the equivalent. If necessary, Lower Explosive Limit (LEL) and oxygen will be monitored with a Combustible Gas Indicator (CGI). If appropriate, fugitive dust will be monitored using a MiniRam Model PDM-3 aerosol monitor. Air will be monitored when any of the following conditions apply:

- initial site entry;
- during any work where a potential IDLH condition or flammable atmosphere could develop;
- excavation work begins on another portion of the site;
- contaminants, other than those previously identified, have been discovered;
- each time a different task or activity is initiated;
- during trenching and/or excavation work.

The designated site safety officer will record air monitoring data and ensure that air monitoring instruments are calibrated and maintained in accordance with manufacturer's specifications. Instruments will be zeroed daily and checked for accuracy. Monitoring results will be recorded in a field notebook and will be transferred to instrument reading logs.

5.2 Work Stoppage Responses

The following responses will be initiated whenever one or more of the action levels necessitating a work stoppage are exceeded:

1 The SSO will be consulted immediately
2 All personnel (except as necessary for continued monitoring and contaminant migration, if applicable) will be cleared from the work area (eg from the exclusion zone).
3 Monitoring will be continued until intrusive work resumes.

5.3 Action Levels During Excavation Activities

Instrument readings will be taken in the breathing zone above the excavation pit unless otherwise noted. Each action level is independent of all other action levels in determining responses.

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Organic Vapors (PID)	LEL %	Responses
0-1 ppm above background	0%	• Continue excavating • Level D protection • Continue monitoring every 10 minutes
1-5 ppm Above Background, Sustained Reading	1-10%	• Continue excavating • Go to Level C protection or employ engineering controls • Continue monitoring every 10 minutes
5-25 ppm Above Background, Sustaineed Reading	10-20%	• Discontinue excavating, unless PID is only action level exceeded. • Level C protection or employ engineering controls • Continue monitoring for organic vapors 200 ft downwind • Continuous monitoring for LEL at excavation pit
>25 ppm Above Background, Sustained Reading	>20%	• Discontinue excavating • Withdraw from area, shut off all engine ignition sources. • Allow pit to vent • Continuous monitoring for organic vapors 200 ft downwind.

Notes: Air monitoring will occur in the breathing zone 30 inches above the excavation pit. Readings may also be taken in the excavation pit but will not be used for action levels.

If action levels for any one of the monitoring parameters are exceeded, the appropriate responses listed in the right hand column should be taken. If instrument readings do not return to acceptable levels after the excavation pit has been vented for a period of greater than one-half hour, a decision will then be made whether or not to seal the pit with suppressant foam.

If, during excavation activities, downwind monitoring PID readings are greater than 5 ppm above background for more than one-half hour, excavation will stop until sustained levels are less then 5 ppm (see Community Air Monitoring Plan).

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6.0 SITE CONTROL

6.1 Work Zones

The primary purpose of site controls is to establish the perimeter of a hazardous area, to reduce the migration of contaminants into clean areas, and to prevent access or exposure to hazardous materials by unauthorized persons. When operations are to take place involving hazardous materials, the site safety officer will establish an exclusion zone, a decontamination zone, and a support zone. These zones "float" (move around the site) depending on the tasks being performed on any given day. The site safety officer will outline these locations before work begins and when zones change. The site safety officer records this information in the site log book.

Due to the dimensions of the Site and the work area, it is expected that an exclusion zone will include the entire fenced area with the exception of the construction entrance area, which will serve as the decontamination zone. A support zone if needed will be located outside of the fenced area. All onsite workers engaged in the excavation of hazardous or contaminated materials must provide evidence of OSHA 24 or 40-hour Hazardous Waste Operations and Emergency Response Operations training to conduct work within the exclusion zone established by the site safety officer. Gross decontamination (as determined by the site Health and Safety Officer) is conducted in the exclusion zone; all other decontamination is performed in the decontamination zone or trailer.

Protective equipment is removed in the decontamination zone. Disposable protective equipment is stored in receptacles staged in the decontamination zone, and non-disposable equipment is decontaminated. All personnel and equipment exit the exclusion zone through the decontamination zone. If a decontamination trailer is provided the first aid equipment, an eye wash unit, and drinking water are kept in the decontamination trailer.

The support zone is used for vehicle parking, daily safety meetings, and supply storage. Eating, drinking, and smoking are permitted only in the support zone. When a decontamination trailer is not provided, the eye wash unit, first aid equipment, and drinking water are kept at a central location designated by the site safety officer.

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7.0 CONTINGENCY PLAN/EMERGENCY RESPONSE PLAN

Site personnel must be prepared in the event of an emergency. Emergencies can take many forms: illnesses, injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather.

Emergency telephone numbers and a map to the hospital will be posted in the command post. Site personnel should be familiar with the emergency procedures, and the locations of site safety, first aid, and communication equipment.

7.1 Emergency Equipment On-site

Private telephones:	Site personnel.
Two-way radios:	Site personnel where necessary.
Emergency Alarms:	On-site vehicle horns*.
First aid kits:	On-site, in vehicles or office.
Fire extinguisher:	On-site, in office or on equipment.

* Horns: Air horns will be supplied to personnel at the discretion of the project superintendent or site safety officer.

7.2 Emergency Telephone Numbers

General Emergencies	911
New York City Police	911
Health Professionals NYC	1-718-218-7352
NYSDEC Spills Division	1-800-457-7362
NYSDEC Hazardous Waste Division	1-718-482-4994
NYCDEP	1-718-699-9811
NYC Department of Health	1-212-788-4711
NYC Fire Department	911
National Response Center	1-800-424-8802
Poison Control	1-212-340-4494
Site Safety Officer	1-631-504-6000
Alternate Site Safety Officer	1-631-504-6000

7.3 Personnel Responsibilities During an Emergency

The project manager is primarily responsible for responding to and correcting any emergency situations. However, in the absence of the project manager, the site safety officer shall act as the project manager's on-site designee and perform the following tasks:

- Take appropriate measures to protect personnel including: withdrawal from the exclusion zone, evacuate and secure the site, or upgrade/downgrade the level of protective clothing and respiratory protection;

- Ensure that appropriate federal, state, and local agencies are informed and emergency response plans are coordinated. In the event of fire or explosion, the local fire department

should be summoned immediately. If toxic materials are released to the air, the local authorities should be informed in order to assess the need for evacuation;

- Ensure appropriate decontamination, treatment, or testing for exposed or injured personnel;

- Determine the cause of incidents and make recommendations to prevent recurrence; and,

- Ensure that all required reports have been prepared.

The following key personnel are planned for this project:

- Project Manager — Mrs. Chawinie Miller (631) 504-6000
- Construction Superintendent — To be added
- Site Safety Officer — Mr. Kevin Waters (631) 504-6000

7.4 Medical Emergencies

A person who becomes ill or injured in the exclusion zone will be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination will be completed and first aid administered prior to transport. First aid will be administered while waiting for an ambulance or paramedics. A Field Accident Report (**Appendix D**) must be filled out for any injury.

A person transporting an injured/exposed person to a clinic or hospital for treatment will take the directions to the hospital (**Appendix D**).and information on the chemical(s) to which they may have been exposed (**Appendix C**).

7.5 Fire or Explosion

In the event of a fire or explosion, the local fire department will be summoned immediately. The site safety officer or his designated alternate will advise the fire commander of the location, nature and identification of the hazardous materials on-site. If it is safe to do so, site personnel may:

- use fire fighting equipment available on site; or,
- remove or isolate flammable or other hazardous materials that may contribute to the fire.

7.6 Evacuation Routes

Evacuation routes established by work area locations for each site will be reviewed prior to commencing site operations. As the work areas change, the evacuation routes will be altered accordingly, and the new route will be reviewed.

Under extreme emergency conditions, evacuation is to be immediate without regard for equipment. The evacuation signal will be a continuous blast of a vehicle horn, if possible, and/or by verbal/radio communication. When evacuating the site, personnel will follow these instructions:

- Keep upwind of smoke, vapors, or spill location.

- Exit through the decontamination corridor if possible.

- If evacuation through the decontamination corridor is not possible, personnel should remove contaminated clothing once they are in a safe location and leave it near the exclusion zone or in a safe place.

- The site safety officer will conduct a head count to ensure that all personnel have been evacuated safely. The head count will be correlated to the site and/or exclusion zone entry/exit log.

- If emergency site evacuation is necessary, all personnel are to escape the emergency situation and decontaminate to the maximum extent practical.

7.7 Spill Control Procedures

Spills associated with site activities may be attributed to project equipment and include gasoline, diesel and hydraulic oil. In the event of a leak or a release, site personnel will inform their supervisor immediately, locate the source of spillage and stop the flow if it can be done safely. A spill containment kit including absorbent pads, booms and/or granulated speedy dry absorbent material will be available to site personnel to facilitate the immediate recovery of the spilled material. Daily inspections of site equipment components including hydraulic lines, fuel tanks, etc. will be performed by their respective operators as a preventative measure for equipment leaks and to ensure equipment soundness. In the event of a spill, site personnel will immediately notify the NYSDEC (1-800-457-7362), and a spill number will be generated.

7.8 Vapor Release Plan

If work zone organic vapor (excluding methane) exceeds 5 ppm, then a downwind reading will be made either 200 feet from the work zone or at the property line, whichever is closer. If readings at this location exceed 5 ppm over background, the work will be stopped.

If 5 ppm of VOCs are recorded over background on a PID at the property line, then an off-site reading will be taken within 20 feet of the nearest residential or commercial property, whichever is closer. If efforts to mitigate the emission source are unsuccessful for 30 minutes, then the designated site safety officer will:

- contact the local police;
- continue to monitor air every 30 minutes, 20 feet from the closest off-site property. If two successive readings are below 5 ppm (non-methane), off-site air monitoring will be halted.
- All property line and off site air monitoring locations and results associated with vapor releases will be recorded in the site safety log book.

APPENDIX A

SITE SAFETY ACKNOWLEDGEMENT FORM

DAILY BREIFING SIGN-IN SHEET

Date:_____ Person Conducting Briefing:_____

Project Name and Location:_____

1. AWARENESS (topics discussed, special safety concerns, recent incidents, etc…):

_____

_____

_____

_____

2. OTHER ISSUES (HASP changes, attendee comments, etc…):

_____

_____

_____

3. ATTENDEES (Print Name):

1.	11.
2.	12.
3.	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

APPENDIX B

SITE SAFETY PLAN AMENDMENTS

SITE SAFETY PLAN AMENDMENT FORM

Site Safety Plan Amendment #: _____

Site Name: _____

Reason for Amendment: _____

_____

_____

_____

Alternative Procedures: _____

_____

_____

_____

Required Changes in PPE: _____

_____

_____

_____

_____ _____

Project Superintendent (signature) **Date**

_____ _____

Health and Safety Consultant (signature) **Date**

_____ _____

Site Safety Officer (signature) **Date**

APPENDIX C

CHEMICAL HAZARDS

CHEMICAL HAZARDS

The attached International Chemical Safety Cards are provided for contaminants of concern that have been identified in soils and/or groundwater at the site.

International Chemical Safety Cards

BENZ(a)ANTHRACENE

ICSC: 0385

1,2-Benzoanthracene
Benzo(a)anthracene
2,3-Benzphenanthrene
Naphthanthracene
$C_{18}H_{12}$
Molecular mass: 228.3

ICSC # 0385
CAS # 56-55-3
RTECS # CV9275000
EC # 601-033-00-9
October 23, 1995 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.		Water spray, powder. In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety goggles face shield or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Personal protection: complete protective clothing including self-contained breathing apparatus.	Well closed.	T symbol N symbol R: 45-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0385

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

ICSC: 0385

BENZ(a)ANTHRACENE

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
COLOURLESS TO YELLOW BROWN FLUORESCENT FLAKES OR POWDER.

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

CHEMICAL DANGERS:

OCCUPATIONAL EXPOSURE LIMITS:
TLV: A2 (suspected human carcinogen); (ACGIH 2004).
MAK:
Carcinogen category: 2 (as pyrolysis product of organic materials)
(DFG 2005).

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
This substance is probably carcinogenic to humans.

PHYSICAL PROPERTIES

Sublimation point: 435°C
Melting point: 162°C
Relative density (water = 1): 1.274
Solubility in water:
none

Vapour pressure, Pa at 20°C: 292
Octanol/water partition coefficient as log Pow: 5.61

ENVIRONMENTAL DATA

Bioaccumulation of this chemical may occur in seafood.

N O T E S

This substance is one of many polycyclic aromatic hydrocarbons - standards are usually established for them as mixtures, e.g., coal tar pitch volatiles. However, it may be encountered as a laboratory chemical in its pure form. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken. Do NOT take working clothes home. Tetraphene is a common name. Card has been partly updated in October 2005 and August 2006: see sections Occupational Exposure Limits, EU classification.

ADDITIONAL INFORMATION

ICSC: 0385 **BENZ(a)ANTHRACENE**

(C) IPCS, CEC, 1994

IMPORTANT LEGAL NOTICE:

Neither NIOSH, the CEC or the IPCS nor any person acting on behalf of NIOSH, the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use. The only modifications made to produce the U.S. version is inclusion of the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

BENZO(a)PYRENE

ICSC: 0104

Benz(a)pyrene
3,4-Benzopyrene
Benzo(d,e,f)chrysene
$C_{20}H_{12}$
Molecular mass: 252.3

ICSC # 0104
CAS # 50-32-8
RTECS # DJ3675000
EC # 601-032-00-3
October 17, 2005 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray, foam, powder, carbon dioxide.
EXPLOSION			
EXPOSURE	See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.	AVOID ALL CONTACT! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN	MAY BE ABSORBED!	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety goggles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place.	Separated from strong oxidants.	T symbol N symbol R: 45-46-60-61-43-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0104

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

BENZO(a)PYRENE

ICSC: 0104

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
PALE-YELLOW CRYSTALS

PHYSICAL DANGERS:

CHEMICAL DANGERS:
Reacts with strong oxidants causing fire and explosion hazard.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: Exposure by all routes should be carefully controlled to levels as low as possible A2 (suspected human carcinogen); (ACGIH 2005).
MAK:
Carcinogen category: 2; Germ cell mutagen group: 2; (DFG 2005).

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its aerosol, through the skin and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
This substance is carcinogenic to humans. May cause heritable genetic damage to human germ cells. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES

Boiling point: 496°C
Melting point: 178.1°C
Density: 1.4
g/cm³

Solubility in water: none (<0.1 g/100 ml)
Vapour pressure :
negligible
Octanol/water partition coefficient as log Pow: 6.04

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms. Bioaccumulation of this chemical may occur in fish, in plants and in molluscs. The substance may cause long-term effects in the aquatic environment.

NOTES

Do NOT take working clothes home. Benzo(a)pyrene is present as a component of polycyclic aromatic hydrocarbons (PAHs) in the environment, usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco.

ADDITIONAL INFORMATION

(C) IPCS, CEC, 1994

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International Chemical Safety Cards

BENZO(b)FLUORANTHENE

ICSC: 0720

Benz(e)acephenanthrylene
2,3-Benzofluoroanthene
Benzo(e)fluoranthene
3,4-Benzofluoranthene
$C_{20}H_{12}$
Molecular mass: 252.3

ICSC # 0720
CAS # 205-99-2
RTECS # CU1400000
EC # 601-034-00-4
March 25, 1999 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE			In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety spectacles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into covered containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	Provision to contain effluent from fire extinguishing. Well closed.	T symbol N symbol R: 45-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0720

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

BENZO(b)FLUORANTHENE

ICSC: 0720

I	**PHYSICAL STATE; APPEARANCE:** COLOURLESS CRYSTALS	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation

IMPORTANT DATA	**PHYSICAL DANGERS:** **CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: A2 (suspected human carcinogen); (ACGIH 2004). MAK: Carcinogen category: 2; (DFG 2004). of its aerosol and through the skin. **INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** This substance is possibly carcinogenic to humans. May cause genetic damage in humans.
PHYSICAL PROPERTIES	Boiling point: 481°C Melting point: 168°C Solubility in water: none Octanol/water partition coefficient as log Pow: 6.12
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to air quality and water quality. 

N O T E S

Benzo(b)fluoranthene is present as a component of polycyclic aromatic hydrocarbons (PAH) content in the environment usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco.ACGIH recommends environment containing benzo(b)fluoranthene should be evaluated in terms of the TLV-TWA for coal tar pitch volatile, as benzene soluble 0.2 mg/m^3. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken.

ADDITIONAL INFORMATION

ICSC: 0720 **BENZO(b)FLUORANTHENE**

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International Chemical Safety Cards

BENZO(k)FLUORANTHENE

ICSC: 0721

Dibenzo(b,jk)fluorene
8,9-Benzofluoranthene
11,12-Benzofluoranthene
$C_{20}H_{12}$
Molecular mass: 252.3

ICSC # 0721
CAS # 207-08-9
RTECS # DF6350000
EC # 601-036-00-5
March 25, 1999 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE			In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety spectacles or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into covered containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	Provision to contain effluent from fire extinguishing. Well closed.	T symbol N symbol R: 45-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0721

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

BENZO(k)FLUORANTHENE

ICSC: 0721

I **M**	**PHYSICAL STATE; APPEARANCE:** YELLOW CRYSTALS	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation of its aerosol and through the skin.

P O R T A N T D A T A	**PHYSICAL DANGERS:** **CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. **OCCUPATIONAL EXPOSURE LIMITS:** TLV not established. MAK: Carcinogen category: 2; (DFG 2004). **INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** This substance is possibly carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point: 480°C Melting point: 217°C Solubility in water: none Octanol/water partition coefficient as log Pow: 6.84
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to air quality and water quality. Bioaccumulation of this chemical may occur in crustacea and in fish. 

N O T E S

Benzo(k)fluoranthene is present as a component of polycyclic aromatic hydrocarbons (PAH) content in the environment usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco.ACGIH recommends environment containing benzo(k)fluoranthene should be evaluated in terms of the TLV-TWA for coal tar pitch volatile, as benzene soluble 0.2 mg/m^3. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken.

ADDITIONAL INFORMATION

ICSC: 0721 **BENZO(k)FLUORANTHENE**

(C) IPCS, CEC, 1994

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International Chemical Safety Cards

CHRYSENE

ICSC: 1672

Benzoaphenanthrene
1,2-Benzophenanthrene
1,2,5,6-Dibenzonaphthalene
$C_{18}H_{12}$
Molecular mass: 228.3

ICSC # 1672
CAS # 218-01-9
RTECS # GC0700000
UN # 3077
EC # 601-048-00-0
October 12, 2006 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray. Dry powder. Foam. Carbon dioxide.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE	See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.	AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety goggles	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Personal protection: P3 filter respirator for toxic particles. Do NOT let this chemical enter the environment. Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place.	Separated from strong oxidants, Provision to contain effluent from fire extinguishing. Store in an area without drain or sewer access.	T symbol N symbol R: 45-68-50/53 S: 53-45-60-61 UN Hazard Class: 9 UN Packing Group: III Signal: Warning Aqua-Cancer Suspected of causing cancer Very toxic to aquatic life with long lasting effects Very toxic to aquatic life

SEE IMPORTANT INFORMATION ON BACK

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European

Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

CHRYSENE

ICSC: 1672

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS TO BEIGE CRYSTALS OR POWDER

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

CHEMICAL DANGERS:
The substance decomposes on burning producing toxic fumes Reacts violently with strong oxidants

OCCUPATIONAL EXPOSURE LIMITS:
TLV: A3 (confirmed animal carcinogen with unknown relevance to humans); (ACGIH 2006).
MAK not established.

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its aerosol, through the skin and by ingestion.

INHALATION RISK:
A harmful concentration of airborne particles can be reached quickly when dispersed

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
This substance is possibly carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 448°C
Melting point: 254 - 256°C
Density: 1.3 g/cm³

Solubility in water:
very poor
Octanol/water partition coefficient as log Pow: 5.9

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms. Bioaccumulation of this chemical may occur in seafood. It is strongly advised that this substance does not enter the environment.

NOTES

Depending on the degree of exposure, periodic medical examination is suggested. Do NOT take working clothes home. This substance does not usually occur as a pure substance but as a component of polyaromatic hydrocarbon (PAH) mixtures. Human population studies have associated PAH's exposure with cancer and cardiovascular diseases.

Transport Emergency Card: TEC (R)-90GM7-III

ADDITIONAL INFORMATION

(C) IPCS, CEC, 1994

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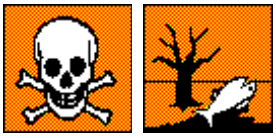
International Chemical Safety Cards

DIBENZO(a,h)ANTHRACENE

ICSC: 0431

1,25,6-Dibenzanthracene
$C_{22}H_{14}$
Molecular mass: 278.4

ICSC # 0431
CAS # 53-70-3
RTECS # HN2625000
EC # 601-041-00-2
October 23, 1995 Peer reviewed



TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray, powder.
EXPLOSION			
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN	Redness. Swelling. Itching.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness.	Face shield or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Personal protection: P3 filter respirator for toxic particles.	Well closed.	T symbol N symbol R: 45-50/53 S: 53-45-60-61

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0431

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

DIBENZO(a,h)ANTHRACENE

ICSC: 0431

I

M

P

O

PHYSICAL STATE; APPEARANCE:
COLOURLESS CRYSTALLINE POWDER.

PHYSICAL DANGERS:

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation, through the skin and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration

R T A N T D A T A	**CHEMICAL DANGERS:** **OCCUPATIONAL EXPOSURE LIMITS:** TLV not established.	of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** The substance may have effects on the skin , resulting in photosensitization. This substance is probably carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point: 524°C Melting point: 267°C Relative density (water = 1): 1.28	Solubility in water: none Octanol/water partition coefficient as log Pow: 6.5
ENVIRONMENTAL DATA	Bioaccumulation of this chemical may occur in seafood.	

N O T E S

This is one of many polycyclic aromatic hydrocarbons - standards are usually established for them as mixtures, e.g., coal tar pitch volatiles. However, it may be encountered as a laboratory chemical in its pure form. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken. Do NOT take working clothes home. DBA is a commonly used name. This substance is one of many polycyclic aromatic hydrocarbons (PAH).

ADDITIONAL INFORMATION

ICSC: 0431 **DIBENZO(a,h)ANTHRACENE**

(C) IPCS, CEC, 1994

IMPORTANT LEGAL NOTICE: Neither NIOSH, the CEC or the IPCS nor any person acting on behalf of NIOSH, the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use. The only modifications made to produce the U.S. version is inclusion of the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

Material Safety Data Sheet

Version 3.1
Revision Date 03/22/2010
Print Date 12/09/2011

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Dibenzofuran

Product Number : 236373
Brand : Aldrich

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA
Telephone : +1 800-325-5832
Fax : +1 800-325-5052
Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Toxic by ingestion

HMIS Classification
Health hazard: 2
Flammability: 1
Physical hazards: 0

NFPA Rating
Health hazard: 2
Fire: 1
Reactivity Hazard: 0

Potential Health Effects

Inhalation May be harmful if inhaled. May cause respiratory tract irritation.
Skin May be harmful if absorbed through skin. May cause skin irritation.
Eyes May cause eye irritation.
Ingestion Toxic if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : Diphenylene oxide

Formula : $C_{12}H_8O$
Molecular Weight : 168.19 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
Dibenzofuran			
132-64-9	205-071-3	-	-

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing give artificial respiration Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for fire-fighters
Wear self contained breathing apparatus for fire fighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protective equipment. Avoid dust formation. Avoid breathing dust. Ensure adequate ventilation.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a dust mask type N95 (US) or type P1 (EN 143) respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves.

Eye protection
Face shield and safety glasses

Skin and body protection
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	crystalline
Colour	white, beige

Safety data

pH	no data available
Melting point	80 - 82 °C (176 - 180 °F) - lit.
Boiling point	154 - 155 °C (309 - 311 °F) at 27 hPa (20 mmHg) - lit.
Flash point	130.0 °C (266.0 °F) - closed cup
Ignition temperature	no data available
Lower explosion limit	no data available
Upper explosion limit	no data available
Water solubility	no data available
Partition coefficient: n-octanol/water	log Pow: 3.77

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Conditions to avoid
no data available

Materials to avoid
Strong oxidizing agents

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides

11. TOXICOLOGICAL INFORMATION

Acute toxicity
no data available

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
no data available

Respiratory or skin sensitization
no data available

Germ cell mutagenicity
no data available

Carcinogenicity

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
no data available

Specific target organ toxicity - single exposure (GHS)
no data available

Specific target organ toxicity - repeated exposure (GHS)
no data available

Aspiration hazard
no data available

Potential health effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion	Toxic if swallowed.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.

Signs and Symptoms of Exposure
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Additional Information
RTECS: HP4430000

12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish	NOEC - Cyprinodon variegatus (sheepshead minnow) - 1 mg/l - 96.0 h
	LC50 - Pimephales promelas (fathead minnow) - 1.05 mg/l - 96.0 h

Persistence and degradability
no data available

Bioaccumulative potential
no data available

Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

13. DISPOSAL CONSIDERATIONS

Product
Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN-Number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (Dibenzofuran)
Reportable Quantity (RQ): 100 lbs
Marine pollutant: Marine pollutant
Poison Inhalation Hazard: No

IMDG

UN-Number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Dibenzofuran)
Marine pollutant: Marine pollutant

IATA
UN-Number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Dibenzofuran)

15. REGULATORY INFORMATION

OSHA Hazards
Toxic by ingestion

DSL Status
All components of this product are on the Canadian DSL list.

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

	CAS-No.	Revision Date
Dibenzofuran	132-64-9	2007-07-01

SARA 311/312 Hazards
Acute Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Dibenzofuran	132-64-9	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Dibenzofuran	132-64-9	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Dibenzofuran	132-64-9	2007-07-01

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Co., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

International Chemical Safety Cards

INDENO(1,2,3-cd)PYRENE

ICSC: 0730

o-Phenylenepyrene
2,3-Phenylenepyrene
$C_{22}H_{12}$
Molecular mass: 276.3

ICSC # 0730
CAS # 193-39-5
RTECS # NK9300000
March 25, 1999 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE			In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		AVOID ALL CONTACT!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety spectacles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into covered containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	Provision to contain effluent from fire extinguishing. Well closed.	R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0730

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

INDENO(1,2,3-cd)PYRENE

ICSC: 0730

I **M** **P**	**PHYSICAL STATE; APPEARANCE:** YELLOW CRYSTALS **PHYSICAL DANGERS:**	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation of its aerosol and through the skin. **INHALATION RISK:**

O R T A N T D A T A	**CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. **OCCUPATIONAL EXPOSURE LIMITS:** TLV not established. MAK: Carcinogen category: 2; (DFG 2004).	Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** This substance is possibly carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point: 536°C Melting point: 164°C Solubility in water: none	Octanol/water partition coefficient as log Pow: 6.58
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to air quality and water quality. Bioaccumulation of this chemical may occur in fish.	

N O T E S

Indeno(1,2,3-cd)pyrene is present as a component of polycyclic aromatic hydrocarbons (PAH) content in the environment usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco.ACGIH recommends environment containing Indeno(1,2,3-c,d)pyrene should be evaluated in terms of the TLV-TWA for coal tar pitch volatile, as benzene soluble 0.2 mg/m^3. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken.

ADDITIONAL INFORMATION

ICSC: 0730 **INDENO(1,2,3-cd)PYRENE**

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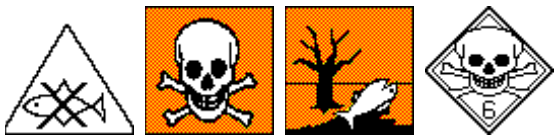
International Chemical Safety Cards

ARSENIC

ICSC: 0013

Grey arsenic
As
Atomic mass: 74.9

ICSC # 0013
CAS # 7440-38-2
RTECS # CG0525000
UN # 1558
EC # 033-001-00-X
October 18, 1999 Peer reviewed



TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames. NO contact with strong oxidizers. NO contact with hot surfaces.	Powder, water spray, foam, carbon dioxide.
EXPLOSION	Risk of fire and explosion is slight when exposed to hot surfaces or flames in the form of fine powder or dust.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST! AVOID ALL CONTACT! AVOID EXPOSURE OF (PREGNANT) WOMEN!	IN ALL CASES CONSULT A DOCTOR!
•INHALATION	Cough. Sore throat. Shortness of breath. Weakness. See Ingestion.	Closed system and ventilation.	Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.
•SKIN	Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
•EYES	Redness.	Face shield or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. Diarrhoea. Nausea. Vomiting. Burning sensation in the throat and chest. Shock or collapse. Unconsciousness.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Sweep spilled substance into sealable containers. Carefully collect remainder, then remove to safe place. Chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment.	Separated from strong oxidants, acids, halogens, food and feedstuffs. Well closed.	Do not transport with food and feedstuffs. Marine pollutant. T symbol N symbol R: 23/25-50/53 S: 1/2-20/21-28-45-60-61 UN Hazard Class: 6.1 UN Packing Group: II

SEE IMPORTANT INFORMATION ON BACK

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International Chemical Safety Cards

ARSENIC

ICSC: 0013

IMPORTANT DATA	**PHYSICAL STATE; APPEARANCE:** ODOURLESS, BRITTLE, GREY, METALLIC-LOOKING CRYSTALS. **PHYSICAL DANGERS:** **CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. Reacts violently with strong oxidants and halogens, causing fire and explosion hazard. Reacts with acids to produce **OCCUPATIONAL EXPOSURE LIMITS:** TLV: 0.01 mg/m³ as TWA A1 (confirmed human carcinogen); BEI issued (ACGIH 2004). MAK: Carcinogen category: 1; Germ cell mutagen group: 3A; (DFG 2004). OSHA PEL: 1910.1018 TWA 0.010 mg/m^3 NIOSH REL: Ca C 0.002 mg/m^3 15-minute See Appendix A NIOSH IDLH: Ca 5 mg/m^3 (as As) See: 7440382	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation of its aerosol and by ingestion. **INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly, when dispersed. **EFFECTS OF SHORT-TERM EXPOSURE:** The substance is irritating to the eyes the skin and the respiratory tract. The substance may cause effects on the gastrointestinal tract cardiovascular system central nervous system kidneys , resulting in severe gastroenteritis, loss of fluid, and electrolytes, cardiac disorders shock convulsions and kidney impairment Exposure above the OEL may result in death. The effects may be delayed. Medical observation is indicated. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the mucous membranes, skin, peripheral nervous system liver bone marrow , resulting in pigmentation disorders, hyperkeratosis, perforation of nasal septum, neuropathy, liver impairment anaemia This substance is carcinogenic to humans. Animal tests show that this substance possibly causes toxicity to human reproduction or development.
PHYSICAL PROPERTIES	Sublimation point: 613°C Density: 5.7 g/cm^3	Solubility in water: none
ENVIRONMENTAL DATA	The substance is toxic to aquatic organisms. It is strongly advised that this substance does not enter the environment.	

N O T E S

The substance is combustible but no flash point is available in literature. Depending on the degree of exposure, periodic medical examination is suggested. Do NOT take working clothes home. Refer also to cards for specific arsenic compounds, e.g., Arsenic pentoxide (ICSC 0377), Arsenic trichloride (ICSC 0221), Arsenic trioxide (ICSC 0378), Arsine (ICSC 0222).

Transport Emergency Card: TEC (R)-61GT5-II

ADDITIONAL INFORMATION

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International Chemical Safety Cards

BARIUM SULFATE

ICSC: 0827

Barium sulphate
Blanc fixe
Artificial barite
$BaSO_4$
Molecular mass: 233.43

ICSC # 0827
CAS # 7727-43-7
RTECS # CR0600000
October 20, 1999 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
•EYES		Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Personal protection: P1 filter respirator for inert particles.		R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0827

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International Chemical Safety Cards

BARIUM SULFATE

ICSC: 0827

IMPORTANT DATA	**PHYSICAL STATE; APPEARANCE:** ODOURLESS TASTELESS, WHITE OR YELLOWISH CRYSTALS OR POWDER. **PHYSICAL DANGERS:** **CHEMICAL DANGERS:** Reacts violently with aluminium powder. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: 10 mg/m³ as TWA; (ACGIH 2004). MAK: (Inhalable fraction) 4 mg/m³; (Respirable fraction) 1.5 mg/m³; (DFG 2004). OSHA PEL†: TWA 15 mg/m^3 (total) TWA 5 mg/m^3 (resp) NIOSH REL: TWA 10 mg/m^3 (total) TWA 5 mg/m^3 (resp) NIOSH IDLH: N.D. See: IDLH INDEX **ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation of its aerosol. **INHALATION RISK:** Evaporation at 20°C is negligible; a nuisance-causing concentration of airborne particles can, however, be reached quickly. **EFFECTS OF SHORT-TERM EXPOSURE:** **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Lungs may be affected by repeated or prolonged exposure to dust particles , resulting in baritosis (a form of benign pneumoconiosis).
PHYSICAL PROPERTIES	Melting point (decomposes): 1600°C Density: 4.5 g/cm³ Solubility in water: none
ENVIRONMENTAL DATA	

N O T E S

Occurs in nature as the mineral barite; also as barytes, heavy spar. Card has been partly updated in October 2005. See section Occupational Exposure Limits.

ADDITIONAL INFORMATION

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International Chemical Safety Cards

CADMIUM

ICSC: 0020

Cd
Atomic mass: 112.4

ICSC # 0020
CAS # 7440-43-9
RTECS # EU9800000
UN # 2570
EC # 048-002-00-0
April 22, 2005 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable in powder form and spontaneously combustible in pyrophoric form. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames, NO sparks, and NO smoking. NO contact with heat or acid(s).	Dry sand. Special powder. NO other agents.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST! AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
•INHALATION	Cough. Sore throat.	Local exhaust or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN		Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety goggles or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. Diarrhoea. Headache. Nausea. Vomiting.	Do not eat, drink, or smoke during work.	Rest. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Personal protection: chemical protection suit including self-contained breathing apparatus. Remove all ignition sources. Sweep spilled substance into containers. Carefully collect remainder, then remove to safe place.	Fireproof. Dry. Keep under inert gas. Separated from igntion sources, oxidants acids, food and feedstuffs	Airtight. Unbreakable packaging; put breakable packaging into closed unbreakable container. Do not transport with food and feedstuffs. Note: E T+ symbol N symbol R: 45-26-48/23/25-62-63-68-50/53 S: 53-45-60-61 UN Hazard Class: 6.1

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0020

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International Chemical Safety Cards

CADMIUM

ICSC: 0020

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
SOFT BLUE-WHITE METAL LUMPS OR GREY POWDER. MALLEABLE. TURNS BRITTLE ON EXPOSURE TO 80°C AND TARNISHES ON EXPOSURE TO MOIST AIR.

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

CHEMICAL DANGERS:
Reacts with acids forming flammable/explosive gas (hydrogen - see ICSC0001.) Dust reacts with oxidants, hydrogen azide, zinc, selenium or tellurium , causing fire and explosion hazard.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: (Total dust) 0.01 mg/m³
(Respirable fraction)
0.002 mg/m³ as TWA A2 (suspected human carcinogen); BEI issued (ACGIH 2005).
MAK: skin absorption (H);
Carcinogen category: 1; Germ cell mutagen group: 3A; (DFG 2004).
OSHA PEL*: 1910.1027 TWA 0.005 mg/m^3 *Note: The PEL applies to all Cadmium compounds (as Cd).
NIOSH REL*: Ca See Appendix A *Note: The REL applies to all Cadmium compounds (as Cd).
NIOSH IDLH: Ca 9 mg/m^3 (as Cd) See: IDLH INDEX

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

INHALATION RISK:
A harmful concentration of airborne particles can be reached quickly when dispersed, especially if powdered.

EFFECTS OF SHORT-TERM EXPOSURE:
The fume is irritating to the respiratory tract Inhalation of fume may cause lung oedema (see Notes). Inhalation of fumes may cause metal fume fever. The effects may be delayed. Medical observation is indicated.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Lungs may be affected by repeated or prolonged exposure to dust particles. The substance may have effects on the kidneys , resulting in kidney impairment This substance is carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 765°C
Melting point: 321°C
Density: 8.6
g/cm3

Solubility in water: none
Auto-ignition temperature: (cadmium metal dust) 250°C

ENVIRONMENTAL DATA

N O T E S

Reacts violently with fire extinguishing agents such as water,foam,carbon dioxideand halons. Depending on the degree of exposure, periodic medical examination is indicated. The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Do NOT take working clothes home. Cadmium also exists in a pyrophoric form (EC No. 048-011-00-X), which bears the additional EU labelling symbol F, R phrase 17, and S phrases 7/8 and 43. UN numbers and packing group will vary according to the physical form of the substance.

ADDITIONAL INFORMATION

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International Chemical Safety Cards

CHROMIUM

ICSC: 0029

Chrome
Cr
Atomic mass: 52.0
(powder)

ICSC # 0029
CAS # 7440-47-3
RTECS # GB4200000
October 27, 2004 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible under specific conditions.	No open flames if in powder form.	In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION		Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST!	
•INHALATION	Cough.	Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
•EYES	Redness.	Safety goggles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Personal protection: P2 filter respirator for harmful particles.		R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0029

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

CHROMIUM

ICSC: 0029

I

M

P

PHYSICAL STATE; APPEARANCE:
GREY POWDER

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

ROUTES OF EXPOSURE:

INHALATION RISK:
A harmful concentration of airborne particles can be reached quickly when dispersed.

O R T A N T D A T A	**CHEMICAL DANGERS:** Chromium is a catalytic substance and may cause reaction in contact with many organic and inorganic substances , causing fire and explosion hazard. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: (as Cr metal, Cr(III) compounds) 0.5 mg/m³ as TWA A4 (ACGIH 2004). MAK not established. OSHA PEL*: TWA 1 mg/m^3 See Appendix C *Note: The PEL also applies to insoluble chromium salts. NIOSH REL: TWA 0.5 mg/m^3 See Appendix C NIOSH IDLH: 250 mg/m^3 (as Cr) See: 7440473 **EFFECTS OF SHORT-TERM EXPOSURE:** May cause mechanical irritation tothe eyesandthe respiratory tract. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:**
PHYSICAL PROPERTIES	Boiling point: 2642°C Melting point: 1900°C Density: 7.15 g/cm³ Solubility in water: none
ENVIRONMENTAL DATA	

N O T E S

The surface of the chromium particles is oxidized to chromium(III)oxide in air. See ICSC 1531 Chromium(III) oxide.

ADDITIONAL INFORMATION

ICSC: 0029 **CHROMIUM**

(C) IPCS, CEC, 1994

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International Chemical Safety Cards

COPPER

ICSC: 0240

Cu
(powder)

ICSC # 0240
CAS # 7440-50-8
RTECS # GL5325000
September 24, 1993 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Special powder, dry sand, NO other agents.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST!	
•INHALATION	Cough. Headache. Shortness of breath. Sore throat.	Local exhaust or breathing protection.	Fresh air, rest. Refer for medical attention.
•SKIN	Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness. Pain.	Safety goggles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. Nausea. Vomiting.	Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers. Carefully collect remainder. Then remove to safe place. (Extra personal protection: P2 filter respirator for harmful particles).	Separated from - See Chemical Dangers.	R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0240

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

COPPER

ICSC: 0240

I

M

P

PHYSICAL STATE; APPEARANCE:
RED POWDER, TURNS GREEN ON EXPOSURE TO MOIST AIR.

PHYSICAL DANGERS:

CHEMICAL DANGERS:

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

O R T A N T D A T A	Shock-sensitive compounds are formed with acetylenic compounds, ethylene oxides and azides. Reacts with strong oxidants like chlorates, bromates and iodates, causing explosion hazard. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: 0.2 mg/m³ fume (ACGIH 1992-1993). TLV (as Cu, dusts & mists): 1 mg/m³ (ACGIH 1992-1993). Intended change 0.1 mg/m³ Inhal., A4 (not classifiable as a human carcinogen); MAK: 0.1 mg/m³ (Inhalable fraction) Peak limitation category: II(2) Pregnancy risk group: D (DFG 2005). OSHA PEL*: TWA 1 mg/m^3 *Note: The PEL also applies to other copper compounds (as Cu) except copper fume. NIOSH REL*: TWA 1 mg/m^3 *Note: The REL also applies to other copper compounds (as Cu) except Copper fume. NIOSH IDLH: 100 mg/m^3 (as Cu) See: 7440508	**EFFECTS OF SHORT-TERM EXPOSURE:** Inhalation of fumes may cause metal fume fever. See Notes. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact may cause skin sensitization.
PHYSICAL PROPERTIES	Boiling point: 2595°C Melting point: 1083°C Relative density (water = 1): 8.9	Solubility in water: none
ENVIRONMENTAL DATA		

N O T E S

The symptoms of metal fume fever do not become manifest until several hours.

ADDITIONAL INFORMATION

ICSC: 0240 **COPPER**

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International Chemical Safety Cards

LEAD

ICSC: 0052

Lead metal
Plumbum
Pb
Atomic mass: 207.2
(powder)

ICSC # 0052
CAS # 7439-92-1
RTECS # OF7525000
October 08, 2002 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE	See EFFECTS OF LONG-TERM OR REPEATED EXPOSURE.	PREVENT DISPERSION OF DUST! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
•INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. Nausea. Vomiting.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Give plenty of water to drink. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment. Personal protection: P3 filter respirator for toxic particles.	Separated from food and feedstuffs incompatible materials See Chemical Dangers.	R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0052

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International Chemical Safety Cards

LEAD

ICSC: 0052

I M P O R T A N T D A T A

PHYSICAL STATE; APPEARANCE:
BLUISH-WHITE OR SILVERY-GREY SOLID IN VARIOUS FORMS. TURNS TARNISHED ON EXPOSURE TO AIR.

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air.

CHEMICAL DANGERS:
On heating, toxic fumes are formed. Reacts with oxidants. Reacts with hot concentrated nitric acid, boiling concentrated hydrochloric acid and sulfuric acid. Attacked by pure water and by weak organic acids in the presence of oxygen.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 0.05 mg/m³ A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued (ACGIH 2004).
MAK:
Carcinogen category: 3B; Germ cell mutagen group: 3A; (DFG 2004).
EU OEL: as TWA 0.15 mg/m³ (EU 2002).
OSHA PEL*: 1910.1025 TWA 0.050 mg/m^3 See Appendix C *Note: The PEL also applies to other lead compounds (as Pb) -- see Appendix C.
NIOSH REL*: TWA 0.050 mg/m^3 See Appendix C
*Note: The REL also applies to other lead compounds (as Pb) -- see Appendix C.
NIOSH IDLH: 100 mg/m^3 (as Pb) See: 7439921

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and by ingestion.

INHALATION RISK:
A harmful concentration of airborne particles can be reached quickly when dispersed, especially if powdered.

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The substance may have effects on the blood bone marrow central nervous system peripheral nervous system kidneys , resulting in anaemia, encephalopathy (e.g., convulsions), peripheral nerve disease, abdominal cramps and kidney impairment. Causes toxicity to human reproduction or development.

PHYSICAL PROPERTIES		
	Boiling point: 1740°C	Density: 11.34 g/cm3
	Melting point: 327.5°C	Solubility in water: none

ENVIRONMENTAL DATA	
	Bioaccumulation of this chemical may occur in plants and in mammals. It is strongly advised that this substance does not enter the environment. 

N O T E S

Depending on the degree of exposure, periodic medical examination is suggested. Do NOT take working clothes home.

Transport Emergency Card: TEC (R)-51S1872

ADDITIONAL INFORMATION

ICSC: 0052 **LEAD**

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International Chemical Safety Cards

MERCURY

ICSC: 0056

Quicksilver
Liquid silver
Hg
Atomic mass: 200.6

ICSC # 0056
CAS # 7439-97-6
RTECS # OV4550000
UN # 2809
EC # 080-001-00-0
April 22, 2004 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION	Risk of fire and explosion.		In case of fire: keep drums, etc., cool by spraying with water.
EXPOSURE		STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN! AVOID EXPOSURE OF ADOLESCENTS AND CHILDREN!	IN ALL CASES CONSULT A DOCTOR!
•INHALATION	Abdominal pain. Cough. Diarrhoea. Shortness of breath. Vomiting. Fever or elevated body temperature.	Local exhaust or breathing protection.	Fresh air, rest. Artificial respiration if indicated. Refer for medical attention.
•SKIN	MAY BE ABSORBED! Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention.
•EYES		Face shield, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work. Wash hands before eating.	Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area in case of a large spill! Consult an expert! Ventilation. Collect leaking and spilled liquid in sealable non-metallic containers as far as possible. Do NOT wash away into sewer. Do NOT let this chemical enter the environment. Chemical protection suit including self-contained breathing apparatus.	Provision to contain effluent from fire extinguishing. Separated from food and feedstuffs Well closed.	Special material. Do not transport with food and feedstuffs. T symbol N symbol R: 23-33-50/53 S: 1/2-7-45-60-61 UN Hazard Class: 8 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0056

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International Chemical Safety Cards

MERCURY

ICSC: 0056

I M P O R T A N T D A T A	**PHYSICAL STATE; APPEARANCE:** ODOURLESS, HEAVY AND MOBILE SILVERY LIQUID METAL. **PHYSICAL DANGERS:** **CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. Reacts violently with ammonia and halogens causing fire and explosion hazard. Attacks aluminium and many other metals forming amalgams. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: 0.025 mg/m³ as TWA (skin) A4 BEI issued (ACGIH 2004). MAK: 0.1 mg/m³ Sh Peak limitation category: II(8) Carcinogen category: 3B (DFG 2003). OSHA PEL†: C 0.1 mg/m^3 NIOSH REL: Hg Vapor: TWA 0.05 mg/m^3 skin Other: C 0.1 mg/m^3 skin NIOSH IDLH: 10 mg/m^3 (as Hg) See: 7439976
	ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation of its vapour and through the skin , also as a vapour! **INHALATION RISK:** A harmful contamination of the air can be reached very quickly on evaporation of this substance at 20°C. **EFFECTS OF SHORT-TERM EXPOSURE:** The substance is irritating to the skin. Inhalation of the vapours may cause pneumonitis. The substance may cause effects on the central nervous systemandkidneys. The effects may be delayed. Medical observation is indicated. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** The substance may have effects on the central nervous system kidneys , resulting in irritability, emotional instability, tremor, mental and memory disturbances, speech disorders. Danger of cumulative effects. Animal tests show that this substance possibly causes toxic effects upon human reproduction.
PHYSICAL PROPERTIES	Boiling point: 357°C Melting point: -39°C Relative density (water = 1): 13.5 Solubility in water: none Vapour pressure, Pa at 20°C: 0.26 Relative vapour density (air = 1): 6.93 Relative density of the vapour/air-mixture at 20°C (air = 1): 1.009
ENVIRONMENTAL DATA	The substance is very toxic to aquatic organisms. In the food chain important to humans, bioaccumulation takes place, specifically in fish. 

N O T E S

Depending on the degree of exposure, periodic medical examination is indicated. No odour warning if toxic concentrations are present. Do NOT take working clothes home.

Transport Emergency Card: TEC (R)-80GC9-II+III

ADDITIONAL INFORMATION

ICSC: 0056 **MERCURY**

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International Chemical Safety Cards

NICKEL

ICSC: 0062

Ni
Atomic mass: 58.7
(powder)

ICSC # 0062
CAS # 7440-02-0
RTECS # QR5950000
EC # 028-002-00-7
October 17, 2001 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Flammable as dust. Toxic fumes may be released in a fire.		Dry sand. NO carbon dioxide. NO water.
EXPLOSION	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
EXPOSURE		PREVENT DISPERSION OF DUST! AVOID ALL CONTACT!	
•INHALATION	Cough. Shortness of breath.	Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES		Safety spectacles, or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Vacuum spilled material. Carefully collect remainder, then remove to safe place. Personal protection: P2 filter respirator for harmful particles.	Separated from strong acids.	Xn symbol R: 40-43 S: 2-22-36

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0062

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

NICKEL

ICSC: 0062

I	**PHYSICAL STATE; APPEARANCE:** SILVERY METALLIC SOLID IN VARIOUS FORMS. **PHYSICAL DANGERS:**

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation of the dust.

IMPORTANT DATA	Dust explosion possible if in powder or granular form, mixed with air. **CHEMICAL DANGERS:** Reacts violently, in powder form, with titanium powder and potassium perchlorate, and oxidants such as ammonium nitrate, causing fire and explosion hazard. Reacts slowly with non-oxidizing acids and more rapidly with oxidizing acids. Toxic gases and vapours (such as nickel carbonyl) may be released in a fire involving nickel. **OCCUPATIONAL EXPOSURE LIMITS:** TLV: (Inhalable fraction) 1.5 mg/m³ as TWA A5 (not suspected as a human carcinogen); (ACGIH 2004). MAK: (Inhalable fraction) sensitization of respiratory tract and skin (Sah); Carcinogen category: 1; (DFG 2004). OSHA PEL*†: TWA 1 mg/m^3 *Note: The PEL does not apply to Nickel carbonyl. NIOSH REL*: Ca TWA 0.015 mg/m^3 See Appendix A *Note: The REL does not apply to Nickel carbonyl. NIOSH IDLH: Ca 10 mg/m^3 (as Ni) See: 7440020	**INHALATION RISK:** Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed. **EFFECTS OF SHORT-TERM EXPOSURE:** May cause mechanical irritation. Inhalation of fumes may cause pneumonitis. **EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:** Repeated or prolonged contact may cause skin sensitization. Repeated or prolonged inhalation exposure may cause asthma. Lungs may be affected by repeated or prolonged exposure. This substance is possibly carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point: 2730°C Melting point: 1455°C Density: 8.9 g/cm3	Solubility in water: none
ENVIRONMENTAL DATA		

N O T E S

At high temperatures, nickel oxide fumes will be formed. Depending on the degree of exposure, periodic medical examination is suggested. The symptoms of asthma often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Anyone who has shown symptoms of asthma due to this substance should avoid all further contact with this substance.

ADDITIONAL INFORMATION

ICSC: 0062 **NICKEL**

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International Chemical Safety Cards

ZINC POWDER

ICSC: 1205

Blue powder
Merrillite
Zn
Atomic mass: 65.4
(powder)



ICSC # 1205
CAS # 7440-66-6
RTECS # ZG8600000
UN # 1436 (zinc powder or dust)
EC # 030-001-00-1
October 24, 1994 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Highly flammable. Many reactions may cause fire or explosion. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames, NO sparks, and NO smoking. NO contact with acid(s), base (s) and incompatible substances (see Chemical Dangers).	Special powder, dry sand, NO other agents. NO water.
EXPLOSION	Risk of fire and explosion on contact with acid(s), base(s), water and incompatible substances.	Closed system, ventilation, explosion-proof electrical equipment and lighting. Prevent build-up of electrostatic charges (e.g., by grounding). Prevent deposition of dust.	In case of fire: cool drums, etc., by spraying with water but avoid contact of the substance with water.
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE!	
•INHALATION	Metallic taste and metal fume fever. Symptoms may be delayed (see Notes).	Local exhaust.	Fresh air, rest. Refer for medical attention.
•SKIN	Dry skin.	Protective gloves.	Rinse and then wash skin with water and soap.
•EYES		Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Abdominal pain. Nausea. Vomiting.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Extinguish or remove all ignition sources. Do NOT wash away into sewer. Sweep spilled substance into containers. then remove to safe place. Personal protection: self-contained breathing apparatus.	Fireproof. Separated from acids, bases oxidants Dry.	Airtight. F symbol N symbol R: 15-17-50/53 S: 2-7/8-43-46-60-61 UN Hazard Class: 4.3 UN Subsidiary Risks: 4.2

SEE IMPORTANT INFORMATION ON BACK

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International Chemical Safety Cards

ZINC POWDER

ICSC: 1205

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
ODOURLESS GREY TO BLUE POWDER.

PHYSICAL DANGERS:
Dust explosion possible if in powder or granular form, mixed with air. If dry, it can be charged electrostatically by swirling, pneumatic transport, pouring, etc.

CHEMICAL DANGERS:
Upon heating, toxic fumes are formed. The substance is a strong reducing agent and reacts violently with oxidants. Reacts with water and reacts violently with acids and bases forming flammable/explosive gas (hydrogen - see ICSC0001) Reacts violently with sulfur, halogenated hydrocarbons and many other substances causing fire and explosion hazard.

OCCUPATIONAL EXPOSURE LIMITS:
TLV not established.

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by inhalation and by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

EFFECTS OF SHORT-TERM EXPOSURE:
Inhalation of fumes may cause metal fume fever. The effects may be delayed.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
Repeated or prolonged contact with skin may cause dermatitis.

PHYSICAL PROPERTIES

Boiling point: 907°C
Melting point: 419°C
Relative density (water = 1): 7.14
Solubility in water: reaction
Vapour pressure, kPa at 487°C: 0.1
Auto-ignition temperature: 460°C

ENVIRONMENTAL DATA

NOTES

Zinc may contain trace amounts of arsenic, when forming hydrogen, may also form toxic gas arsine (see ICSC 0001 and ICSC 0222). Reacts violently with fire extinguishing agents such as water, halons, foam and carbon dioxide. The symptoms of metal fume fever do not become manifest until several hours later. Rinse contaminated clothes (fire hazard) with plenty of water.

Transport Emergency Card: TEC (R)-43GWS-II+III
NFPA Code: H0; F1; R1;

ADDITIONAL INFORMATION

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Material Safety Data Sheet

Version 4.0
Revision Date 03/12/2010
Print Date 12/09/2011

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	4,4'-DDD PESTANAL,250 MG (2,2-BIS(4-CHL&
Product Number	:	35486
Brand	:	Fluka
Company	:	Sigma-Aldrich 3050 Spruce Street SAINT LOUIS MO 63103 USA
Telephone	:	+1 800-325-5832
Fax	:	+1 800-325-5052
Emergency Phone #	:	(314) 776-6555

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Toxic by ingestion, Harmful by skin absorption., Possible carcinogen.

GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H301	Toxic if swallowed.
H312	Harmful in contact with skin.
H351	Suspected of causing cancer.
H400	Very toxic to aquatic life.
H413	May cause long lasting harmful effects to aquatic life.

Precautionary statement(s)

P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

HMIS Classification

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical hazards:	0

NFPA Rating

Health hazard:	2
Fire:	0
Reactivity Hazard:	0

Potential Health Effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Skin	Harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.
Ingestion	Toxic if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : 1,1-Dichloro-2,2-bis(4-chlorophenyl)ethane
4,4′-DDD
TDE

Formula : $C_{14}H_{10}Cl_4$
Molecular Weight : 320.04 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane			
72-54-8	200-783-0	-	-

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing give artificial respiration Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for fire-fighters
Wear self contained breathing apparatus for fire fighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protective equipment. Avoid dust formation. Avoid breathing dust. Ensure adequate ventilation. Evacuate personnel to safe areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves.

Eye protection
Face shield and safety glasses

Skin and body protection
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	solid

Safety data

pH	no data available
Melting point	94.0 - 96.0 °C (201.2 - 204.8 °F)
Boiling point	193.0 °C (379.4 °F) at 1.3 hPa (1.0 mmHg)
Flash point	no data available
Ignition temperature	no data available
Lower explosion limit	no data available
Upper explosion limit	no data available
Vapour pressure	< 0.00001 hPa (< 0.00001 mmHg) at 25.0 °C (77.0 °F)
Density	1.38 g/cm3
Water solubility	no data available
Partition coefficient: n-octanol/water	log Pow: 6.02

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Conditions to avoid
no data available

Materials to avoid
Strong oxidizing agents

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Hazardous decomposition products formed under fire conditions. - Nature of decomposition products not known.

11. TOXICOLOGICAL INFORMATION

Acute toxicity
LD50 Oral - Hamster - > 5,000 mg/kg

TDLo Oral - Human - 428.5 mg/kg
Remarks: Endocrine:Adrenal cortex hypoplasia.

TDLo Oral - rat - 6,000 mg/kg
Remarks: Cardiac:Other changes. Gastrointestinal:Other changes. Kidney, Ureter, Bladder:Changes in both tubules and glomeruli.

TDLo Oral - rat - 14 mg/kg
Remarks: Liver:Changes in liver weight. Endocrine:Estrogenic. Musculoskeletal:Other changes.

TDLo Oral - rat - 2,100 mg/kg
Remarks: Behavioral:Altered sleep time (including change in righting reflex).

LD50 Dermal - rabbit - 1,200 mg/kg
Remarks: Behavioral:Excitement. Behavioral:Convulsions or effect on seizure threshold. Skin irritation

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
no data available

Respiratory or skin sensitization
no data available

Germ cell mutagenicity

no data available

Carcinogenicity

This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Limited evidence of carcinogenicity in animal studies

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

no data available

Specific target organ toxicity - single exposure (GHS)
no data available

Specific target organ toxicity - repeated exposure (GHS)
no data available

Aspiration hazard
no data available

Potential health effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion	Toxic if swallowed.
Skin	Harmful if absorbed through skin. May cause skin irritation.

Eyes May cause eye irritation.

Signs and Symptoms of Exposure
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Additional Information
RTECS: KI0700000

12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish	LC50 - other fish - 1.18 - 9 mg/l - 96.0 h
	LC50 - Lepomis macrochirus (Bluegill) - 0.04 - 0.05 mg/l - 96.0 h
	LC50 - Oncorhynchus mykiss (rainbow trout) - 0.06 - 0.09 mg/l - 96.0 h
	LC50 - Pimephales promelas (fathead minnow) - 3.47 - 5.58 mg/l - 96.0 h
Toxicity to daphnia and other aquatic invertebrates.	EC50 - Daphnia pulex (Water flea) - 0.01 mg/l - 48 h

Persistence and degradability
no data available

Bioaccumulative potential
Indication of bioaccumulation.

Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

13. DISPOSAL CONSIDERATIONS

Product
Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN-Number: 2811 Class: 6.1 Packing group: III
Proper shipping name: Toxic solids, organic, n.o.s. (2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane)
Reportable Quantity (RQ): 1 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN-Number: 2811 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: TOXIC SOLID, ORGANIC, N.O.S. (2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane)
Marine pollutant: No

IATA
UN-Number: 2811 Class: 6.1 Packing group: III
Proper shipping name: Toxic solid, organic, n.o.s. (2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane)

15. REGULATORY INFORMATION

OSHA Hazards
Toxic by ingestion, Harmful by skin absorption., Possible carcinogen.

DSL Status
This product contains the following components that are not on the Canadian DSL nor NDSL lists.

	CAS-No.
2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane	72-54-8

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane	72-54-8	

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane	72-54-8	

New Jersey Right To Know Components

	CAS-No.	Revision Date
2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane	72-54-8	

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. 2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane	72-54-8	

16. OTHER INFORMATION

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Co., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

ChemCAS

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AdChoices

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Search
72-55-9 msds
GO
MSDS 250,000+

MSDS : 2,2-Bis-(4-chlorophenyl)-1,1-dichloroethylene, 99%
CAS : 72-55-9
SYNONYMS : p,p'-DDE ; ethylene,1,1-dichloro-2,2-bis-(p-chlorophenyl)- ; DDT dehydrochloride ; DDE; 1-1'-(Dichloroethenylidene)bis(4-chlorobenzene)

MSDS Safety Sheet
We Get Companys In Compliance & Keep Them There! Custom Catalogs
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AdChoices

Catalog of Chemical Suppliers, Buyers, Custom Synthesis Companies And Equipment Manufacturers
[2,2-Bis-(4-chlorophenyl)-1,1-dichloroethylene, 99% 72-55-9]

Suppliers:

Not Available

Buyers:

Not Available

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AdChoices

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

CAS#	Chemical Name	%	EINECS#
72-55-9	2,2-Bis-(4-chlorophenyl)-1,1-dichloroethylene	99	200-784-6

Hazard Symbols: XN
Risk Phrases: 22 33

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW
Harmful if swallowed. Danger of cumulative effects.Cancer suspect agent.Possible risks of irreversible effects.

Potential Health Effects
Eye:
May cause eye irritation.
Skin:
May cause skin irritation.
Ingestion:
May cause irritation of the digestive tract. May be harmful if swallowed. Ingestion of large amounts may cause liver and/or kidney damage.
Inhalation:
May cause respiratory tract irritation.
Chronic:
May cause cancer according to animal studies. Adverse reproductive effects have been reported in animals. Laboratory experiments have resulted in mutagenic effects.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:
Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin:
Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Ingestion:
If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation:
Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician:
Treat symptomatically and supportively.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Will burn if involved in a fire.
Extinguishing Media:
For large fires, use water spray, fog or regular foam. For small fires, use dry chemical, carbon dioxide, water spray or regular foam. Cool containers with flooding quantities of water until well after fire is out.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks:
Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up, then place into a suitable container for disposal. Avoid generating dusty conditions. Provide ventilation.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:
Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Do not ingest or inhale. Use with adequate ventilation.
Storage:
Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:
Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.
Exposure Limits
CAS# 72-55-9:

Personal Protective Equipment

Eyes:
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin:
Wear appropriate protective gloves to prevent skin exposure.
Clothing:
Wear appropriate protective clothing to prevent skin exposure.
Respirators:
A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Crystals
Color: white
Odor: None reported.
pH: Not available.
Vapor Pressure: 6.5106 mm Hg @ 20 C
Viscosity: Not available.
Boiling Point: 336 deg C
Freezing/Melting Point: 88.00 - 90.00 deg C
Autoignition Temperature: Not available.
Flash Point: Not available.
Explosion Limits, lower: Not available.
Explosion Limits, upper: Not available.
Decomposition Temperature:
Solubility in water: 0.010 ppm
Specific Gravity/Density:
Molecular Formula: C14H8Cl4
Molecular Weight: 318.02

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:
Stable under normal temperatures and pressures.
Conditions to Avoid:
Incompatible materials, dust generation, strong oxidants.
Incompatibilities with Other Materials:
Strong oxidizing agents - strong bases.
Hazardous Decomposition Products:
Hydrogen chloride, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 72-55-9: KV9450000
LD50/LC50:
CAS# 72-55-9: Oral, mouse: LD50 = 700 mg/kg; Oral, rat: LD50 = 880 mg/kg.
Carcinogenicity:
2,2-Bis-(4-chlorophenyl)-1,1-dichloroethylene -
California: carcinogen, initial date 1/1/89

Other:
See actual entry in RTECS for complete information.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Ecotoxicity:
Estimated BCF value = 8,300 based on water solubility. Estimated Koc value = 8,300. There was no movement of DDE reported in soil column mobility experiments.

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Dispose of in a manner consistent with federal, state, and local regulations.

**** SECTION 14 - TRANSPORT INFORMATION ****

IATA
Not regulated as a hazardous material.
IMO
Not regulated as a hazardous material.
RID/ADR
Not regulated as a hazardous material.
USA RQ: CAS# 72-55-9: 1 lb final RQ; 0.454 kg final RQ

**** SECTION 15 - REGULATORY INFORMATION ****

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols: XN
Risk Phrases:
R 22 Harmful if swallowed.
R 33 Danger of cumulative effects.
Safety Phrases:
S 24/25 Avoid contact with skin and eyes.
WGK (Water Danger/Protection)
CAS# 72-55-9: 3
Canada
None of the chemicals in this product are listed on the DSL/NDSL list.
CAS# 72-55-9 is listed on Canada's Ingredient Disclosure List.
US FEDERAL
TSCA
CAS# 72-55-9 is not listed on the TSCA inventory.
It is for research and development use only.

**** SECTION 16 - ADDITIONAL INFORMATION ****

MSDS Creation Date: 9/28/1998 Revision #3 Date: 3/18/2003

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

Search More 72-55-9 msds GO

ALL MSDS PAGES IN THIS GROUP

NAME	CAS
M-Benzyloxybenzyl Alcohol , 97%	1700-30-7
Octaphenylcyclotetrasiloxane, 98%	546-56-5
Cetylpyridinium chloride	123-03-5
3,4-Difluorophenol, 99%	2713-33-9
1-Benzyl-4-Hydroxypiperidine, 97%	4727-72-4
4-tert-Butylbenzoyl chloride	1710-98-1
Borane-morpholine complex, 97%	4856-95-5
Benzyl Ether, 99%	103-50-4
5-Amino-1-Naphtol (Pract)	83-55-6
Pyridinium-P-Toluenesulfonate 98%	24057-28-1
Pyrogallol Red, 98% (Titr.)	32638-88-3
Amberlite ira 416	9002-26-0
3-Methoxybenzonitrile, 98%	1527-89-5
1-Adamantanemethanol, 99%	770-71-8
Inosine, 99%	58-63-9
Pentafluoropropionic Acid	422-64-0
Pyruvic Acid	127-17-3
Potassium hydrogen fluoride, 99+%	7789-29-9
Aluminum Nitride, 98% Particle Size <10 Micron	24304-00-5
Nickel(II) hydroxide, c.p., 60-61% Ni	12054-48-7
1-Adamantanamine sulfate, 99%	31377-23-8
S-(Thiobenzoyl)-Thioglycolic Acid, 97%	942-91-6
N,N-Dimethyl-P-Nitroaniline	100-23-2
Benzofuroxan	480-96-6
cis-2-Aminomethyl-1-cyclohexanol hydrochloride, 99%	24947-68-0
Silver Phosphate, 98% (Titr.)	7784-09-0

4-Cyano-4-Phenylpiperidine Hydrochloride, 99% (TLC)	51304-58-6
Methanesulfonamide	3144-09-0
gamma-Octanoic lactone, 98%	104-50-7
Cis,cis,cis,cis-1,2,3,4-cyclopentane- tetracarboxylic dianhydride,	4802-47-5
Tetrachloroethylene Carbonate, 98+%	22432-68-4
Oxamic Acid, 98%	471-47-6
1O,11-Dihydro-5H-Dibenzo(A,D)-Cycloheptene, 98%	833-48-7
Thallium (I) Sulfate, 99.9+%	7446-18-6
N-(2,6-Dimethylphenylcarbamoyl-Methyl)-Iminodiacetic Acid, 99%	59160-29-1
P-(Dimethylamino)cinnamic Acid, 99%	1552-96-1
Biebrich Scarlet, 99% (UV-VIS)	4196-99-0
4-Chlorobenzenediazonium hexafluoro- phosphate	1582-27-0
Ammonium hexachloroiridate(IV), 99.99%	16940-92-4
Methylamine-d2 deuteriochloride, 98+ atom % D	593-51-1
2,2-Bis-(4-chlorophenyl)-1,1-dichloroethylene, 99%	72-55-9
Nitro red	56431-61-9
Methyl 2,3-dichlorobenzoate, 98+%	2905-54-6
Isopropyl Bromoacetate, 98% (GC)	29921-57-1
1-Iodo-4-Nitrobenzene, 99%	636-98-6
4-Ethylcyclohexanol, 99% cis/trans mixture	4534-74-1
Fluorescamine	38183-12-9
Tris(2,2,6,6-Tetramethyl-3,5-Heptanedionato)Dysprosium(III), 99+%	15522-69-7
3-Amino-2,2,5,5-Tetramethyl-1-Pyrrolidinyloxy, 99% (Titr.)	34272-83-8
3,4-Dihydroxyphenylacetic Acid,98%	102-32-9

Free MSDS Search (Providing 250，000+ Material Properties)
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International Chemical Safety Cards

DDT

ICSC: 0034

Dichlorodiphenyltrichloroethane
1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane
2,2-bis(p-Chlorophenyl)-1,1,1-trichloroethane
1,1'-(2,2,2-Trichloroethylidene)bis(4-chlorobenzene)
p,p'-DDT
$C_{14}H_9Cl_5$
Molecular mass: 354.5

ICSC # 0034
CAS # 50-29-3
RTECS # KJ3325000
UN # 2761
EC # 602-045-00-7
April 20, 2004 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible. Liquid formulations containing organic solvents may be flammable. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames.	Powder, water spray, foam, carbon dioxide.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN!	
•INHALATION	Cough.	Local exhaust or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
•EYES	Redness.	Safety goggles, or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Tremors. Diarrhoea. Dizziness. Headache. Vomiting. Numbness. Paresthesias. Hyperexcitability. Convulsions.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Give a slurry of activated charcoal in water to drink. Rest. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Do NOT let this chemical enter the environment. Sweep spilled substance into sealable non-metallic containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Personal protection: P3 filter respirator for toxic particles.	Provision to contain effluent from fire extinguishing. Separated from iron, aluminum and its salts, food and feedstuffs See Chemical Dangers.	Do not transport with food and feedstuffs. Severe marine pollutant. T symbol N symbol R: 25-40-48/25-50/53 S: 1/2-22-36/37-45-60-61 UN Hazard Class: 6.1 UN Packing Group: III

SEE IMPORTANT INFORMATION ON BACK

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

International Chemical Safety Cards

DDT

ICSC: 0034

IMPORTANT DATA

PHYSICAL STATE; APPEARANCE:
COLOURLESS CRYSTALS WHITE POWDER.
TECHNICAL PRODUCT IS WAXY SOLID.

PHYSICAL DANGERS:

CHEMICAL DANGERS:
On combustion, forms toxic and corrosive fumesincludinghydrogen chloride. Reacts with aluminium and iron.

OCCUPATIONAL EXPOSURE LIMITS:
TLV: 1 mg/m³ as TWA A3 (ACGIH 2004).
MAK: 1 mg/m³ H
Peak limitation category: II(8)
(DFG 2003).
OSHA PEL: TWA 1 mg/m^3 skin
NIOSH REL: Ca TWA 0.5 mg/m^3 See Appendix A
NIOSH IDLH: Ca 500 mg/m^3 See: 50293

ROUTES OF EXPOSURE:
The substance can be absorbed into the body by ingestion.

INHALATION RISK:
Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly especially if powdered.

EFFECTS OF SHORT-TERM EXPOSURE:
May cause mechanical irritation. The substance may cause effects on the central nervous system , resulting in convulsions and respiratory depression Exposure at high levels may result in death. Medical observation is indicated.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:
The substance may have effects on the central nervous system and liver. This substance is possibly carcinogenic to humans. Animal tests show that this substance possibly causes toxicity to human reproduction or development.

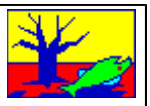
PHYSICAL PROPERTIES

Boiling point: 260°C
Melting point: 109°C
Density: 1.6
g/cm3

Solubility in water: poor
Octanol/water partition coefficient as log Pow: 6.36

ENVIRONMENTAL DATA

The substance is very toxic to aquatic organisms. This substance may be hazardous to the environment; special attention should be given to birds. Bioaccumulation of this chemical may occur along the food chain, for example in milk and aquatic organisms. This substance does enter the environment under normal use. Great care, however, should be given to avoid any additional release, e.g. through inappropriate disposal.



NOTES

Depending on the degree of exposure, periodic medical examination is indicated. Carrier solvents used in commercial formulations may change physical and toxicological properties. Do NOT take working clothes home. Consult national legislation. Agritan, Azotox, Anofex, Ixodex, Gesapon, Gesarex, Gesarol, Guesapon, Clofenotane, Zeidane, Dicophane, Neocid are trade names.

Transport Emergency Card: TEC (R)-61GT7-III

ADDITIONAL INFORMATION

(C) IPCS, CEC, 1994

IMPORTANT LEGAL NOTICE:

Neither NIOSH, the CEC or the IPCS nor any person acting on behalf of NIOSH, the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use. The only modifications made to produce the U.S. version is inclusion of the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

APPENDIX D

HOSPITAL INFORMATION AND MAP

FIELD ACCIDENT REPORT

FIELD ACCIDENT REPORT

This report is to be filled out by the designated Site Safety Officer after EVERY accident.

PROJECT NAME _____ PROJECT. NO._____

Date of Accident _____ Time _____ Report By _____

Type of Accident (Check One):

( ) Vehicular ( ) Personal ( ) Property

Name of Injured _____ DOB or Age _____

How Long Employed _____

Names of Witnesses _____

_____

Description of Accident _____

_____

_____

Action Taken _____

_____

_____

Did the Injured Lose Any Time? _____ How Much (Days/Hrs.)? _____

Was Safety Equipment in Use at the Time of the Accident (Hard Hat, Safety Glasses, Gloves, Safety Shoes, etc.)? _____

_____

(If not, it is the EMPLOYEE'S sole responsibility to process his/her claim through his/her Health and Welfare Fund.)

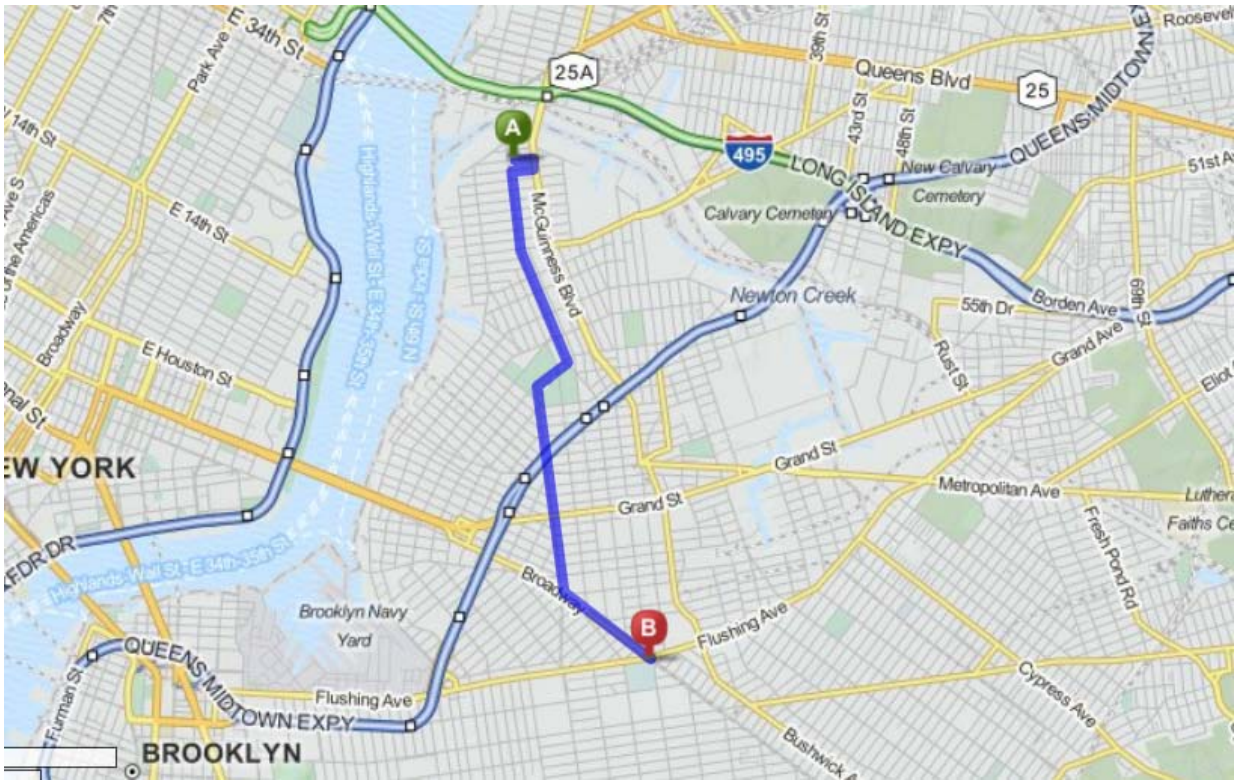
INDICATE STREET NAMES, DESCRIPTION OF VEHICLES, AND NORTH ARROW

HOSPITAL INFORMATION AND MAP

The hospital nearest the site is:

The BROOKLYN HOSPITAL CENTER

WOODHULL MEDICAL CENTER
760 Broadway Brooklyn, New York 11206
718-963-8000
3.0 Miles – About 9 Minutes



START:
A 77 Clay Street

Head east toward McGuinness Blvd

Turn right onto McGuinness Blvd

Turn right onto Dupont Street

Turn right onto Driggs Avenue

Turn left onto Union Avenue

Turn slight left onto Broadway

760 Broadway is on the right.

HOSPITAL:
B 760 Broadway, Brooklyn, NY 11206-5317