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1353 FLATBUSH AVENUE

BROOKLYN, NEW YORK

Remedial Action Work Plan & STIP List (4/26/2016)

E-Designation Site Number: E-233
OER Project Number: 16EHAZ157K
NYC VCP Project Number 16CVCP070K

Prepared for:

Hello Living / Hello Flatbush, LLC

33 35th Street – 6th Floor

Brooklyn, NY 11232

Prepared by:

HAKS
40 Wall Street, 11th Floor
New York, New York 10005

APRIL 2016

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April 26, 2016

New York City Office of Environmental Remediation
City Voluntary Cleanup Program
c/o Shaminder Chawla
100 Gold Street, 2nd Floor
New York, NY 10038

Re: VCP # 16CVCP070K
E-Designation # 16EHAZ157K
1353 Flatbush Avenue, Brooklyn, New York
Remedial Action Work Plan (RAWP) Stipulation List

Dear Mr. Chawla:

Hydro Tech Environmental, Corp. hereby submits a Remedial Action Plan (RAWP) Stipulation List for the Site to the New York City Office of Environmental Remediation (OER) on behalf of Hello Living/Hello Flatbush, LLC. This letter serves as an addendum to the RAWP to stipulate additional content, requirements, and procedures that will be followed during the site remediation. The contents of this list are added to the RAWP and will supersede the content in the RAWP where there is a conflict in purpose or intent. The additional requirements/procedures include the following Stipulation List below:

1. The criterion attached in **Appendix 1** will be utilized if additional petroleum containing tank or vessel is identified during the remedial action or subsequent redevelopment excavation activities. All petroleum spills will be reported to the NYSDEC hotline as required by applicable laws and regulations. This contingency plan is designed for heating oil tanks and other small or moderately sized storage vessels. If larger tanks, such as gasoline storage tanks are identified, OER will be notified before this criterion is utilized.

2. A pre-construction meeting is required prior to start of remedial excavation work at the site. A pre-construction meeting will be held at the site and will be attended by OER, the developer or developer representative, the consultant, excavation/general contractor, and if applicable, the soil broker.

3. A Historic Fill Transfer and Disposal Notification Form to each disposal facility and a pre-approval letter from all disposal facilities will be provided to OER prior to any soil/fill material removal from the site. The Historic Fill Transfer and Disposal Notification Form

template is attached in **Appendix 2**. Documentation specified in the RAWP - Appendix 3 - Section 1.6 "Materials Disposal Off-Site" will be provided to OER. If a different disposal facility for the soil/fill material is selected, OER will be notified immediately.

4. Signage for the project will include a sturdy placard mounted in a publically accessible right of way to building and other permits signage will consist of the NYC VCP Information Sheet (attached **Appendix 3**) announcing the remedial action. The Information sheet will be laminated and permanently affixed to the placard.

5. If your site contains hazardous waste that will be excavated and disposed of offsite, OER can work with your development team to seek an exemption for your property from the $130/ton state Hazardous Waste Program Fee. To qualify for an exemption, your site must be enrolled in the city Voluntary Cleanup Program; hazardous waste must result from remedial action set forth in a cleanup plan approved by OER; and OER must oversee the cleanup. It is the applicant's responsibility to notify your OER Project Manager, copying supervising Project Manager and Shaminder Chawla, before hazardous waste is shipped from your site. Unless the Department of Environmental Conservation is notified before waste is shipped from your site, you may not receive an exemption from the fee. The exemption does not cover, and you remain liable for, the Special Assessment on Hazardous Waste (established by ECL§ 27-0923) which charges a fee of up to $27 per ton for hazardous waste generated that is due at the State Department of Taxation and Finance 30 days after the end of the quarter in which the waste was generated. **Appendix 4** includes additional information about the Exemption for Hazardous Waste Program Fee.

6. Collection and analysis of six end-point samples from the bottom of the excavation to evaluate the performance of the remedy with respect to attainment of Track 1 SCOs. A map indicating end-point sampling locations is attached in **Appendix 5**. Samples will be analyzed for contaminants of concern VOCs, SVOCs, Metals, PCBs, and Pesticides.

7. OER requires parties seeking City Brownfield Incentive Grants to carry insurance. For a cleanup grant, both the excavator and the trucking firm(s) that handle removal of soil must carry or be covered under a commercial general liability (CGL) policy that provides $1 million per claim in coverage. OER recommends that excavators and truckers also carry contractors pollution liability (CPL) coverage, also providing $1 million per claim in coverage. The CGL policy, and the CPL policy if obtained, must name the City of New York, the NYC Economic Development Corporation, and Brownfield Redevelopment Solutions as additional insured. For an investigation grant, an environmental consultant must be a qualified vendor in the BIG program and carry $1 million of professional liability (PL) coverage. A fact sheet regarding insurance is attached as **Appendix 6**.

8. Daily reports will be provided during active excavation work. If no work is performed for extended time period, daily report frequency will be reduced to weekly basis. Daily report template is attached in **Appendix 7.**

9. Monthly reports will be provided by the owner/developer after excavation work is completed for the duration of the construction period. Monthly report template is attached in **Appendix 8**.

10. Trucking log sheets will be utilized as trucks are transported from sites, and completed logs should be attached to the Remedial Action Report (RAR) as an appendix. The goal of this log is to clearly document the destination of material leaving the site, the parties responsible for its transfer, and other pertinent details. The trucking log template is provided in **Appendix 9**.

11. A 20-mil vapor barrier will be installed beneath the structure's slab and along foundation sidewalls. The barrier chosen for this project is Husky® Yellow Guard®, manufactured by Poly-America. **Appendix 10** provides manufactures specifications.

12. Truck route is included in **Appendix 11**

13. If the Site does not achieve an overall Track 1 Unrestricted Use cleanup, a demarcation layer will be placed between the residual soil/fill and clean soil cover in the rear landscaped areas.

Sincerely,

Hydro Tech Environmental, Corp.

A.J. Infante
Project Geologist

Cc: Sarah Pong, NYCOER
Eli Karp, Hello Living LLC

Appendix 1
Generic Procedures for Management of Underground Storage Tanks
Identified under the NYC VCP

Prior to Tank removal, the following procedures should be followed:

- Remove all fluid to its lowest draw-off point.
- Drain and flush piping into the tank.
- Vacuum out the "tank bottom" consisting of water product and sludge.
- Dig down to the top of the tank and expose the upper half.
- Remove the fill tube and disconnect the fill, gauge, product, vent lines and pumps. Cap and plug open ends of lines.
- Temporarily plug all tank openings, complete the excavation, remove the tank and place it in a secure location.
- Render the tank safe and check the tank atmosphere to ensure that petroleum vapors have been satisfactorily purged from the tank.
- Clean tank or remove to storage yard for cleaning.
- If the tank is to be moved, it must be transported by licensed waste transporter. Plug and cap all holes prior to transport leaving a 1/8 inch vent hole located at the top of the tank during transport.
- After cleaning, the tank must be made acceptable for disposal at a scrap yard, cleaning the tanks interior with a high pressure rinse and cutting the tank in several pieces.

During the tank and pipe line removal, the following field observations should be made and recorded:

- A description and photographic documentation of the tank and pipe line condition (pitting, holes, staining, leak points, evidence of repairs, etc.).
- Examination of the excavation floor and sidewalls for physical evidence of contamination (odor, staining, sheen, etc.).
- Periodic field screening (through bucket return) of the floor and sidewalls of the excavation, with a calibrated photoionization detector (PID).

<u>Impacted Soil Excavation Methods</u>
The excavation of the impacted soil will be performed following the removal of the existing tanks. Soil excavation will be performed in accordance with the procedures described under Section 5.5 of Draft DER-10 as follows:

- A description and photographic documentation of the excavation.
- Examination of the excavation floor and sidewalls for physical evidence of contamination (odor, staining, sheen, etc.).
- Periodic field screening (through bucket return) of the floor and sidewalls of the excavation, with calibrated photoionization detector (PID).

Final excavation depth, length, and width will be determined in the field, and will depend on the horizontal and vertical extent of contaminated soils as identified through physical examination (PID response, odor, staining, etc.). Collection of verification samples will be performed to evaluate the success of the removal action as specified in this document.
The following procedure will be used for the excavation of impacted soil (as necessary and appropriate):

- Wear appropriate health and safety equipment as outlined in the Health and Safety Plan.

- Prior to excavation, ensure that the area is clear of utility lines or other obstructions. Lay plastic sheeting on the ground next to the area to be excavated.
- Using a rubber-tired backhoe or track mounted excavator, remove overburden soils and stockpile, or dispose of, separate from the impacted soil.
- If additional UST's are discovered, the NYSDEC will be notified and the best course of action to remove the structure should be determined in the field. This may involve the continued trenching around the perimeter to minimize its disturbance.
- If physically contaminated soil is present (e.g., staining, odors, sheen, PID response, etc.) an attempt will be made to remove it, to the extent not limited by the site boundaries or the bedrock surface. If possible, physically impacted soil will be removed using the backhoe or excavator, segregated from clean soils and overburden, and staged on separated dedicated plastic sheeting or live loaded into trucks from the disposal facility. Removal of the impacted soils will continue until visibly clean material is encountered and monitoring instruments indicate that no contaminants are present.
- Excavated soils which are temporarily stockpiled on-site will be covered with tarp material while disposal options are determined. Tarp will be checked on a daily basis and replaced, repaired or adjusted as needed to provide full coverage. The sheeting will be shaped and secured in such a manner as to drain runoff and direct it toward the interior of the property.

Once the site representative and regulatory personnel are satisfied with the removal effort, verification of confirmatory samples will be collected from the excavation in accordance with DER-10.

Appendix 2

Historic Fill Transfer and Disposal Notification Form

Historic Fill & Soil Disposal Notification Form
New York City Office of Environmental Remediation

Date: April 26, 2016

To operators and representatives of disposal facilities and government regulators:

The New York City Office of Environmental Remediation (OER) operates several environmental remediation regulatory programs in New York City that manage light to moderately contaminated properties that are planned for redevelopment. These projects commonly involve the removal of historical fill and soil from properties for development and other purposes. As with any environmental regulatory program, lawful transport and disposal of historic fill and soil is mandatory. It is also our highest priority.

Disposal facilities, recycling facilities and clean fill facilities (collectively, "receiving facilities") for historic fill and soil may be located in New York or neighboring states. Our research has indicated that a wide range of facility types and a complex set of regulatory requirements and obligations for a receiving facility operation exist within each jurisdiction. Receiving facilities are required to comply with applicable laws and regulations and may operate under state and local authority via permits, licenses, registrations, agreements and other legal instruments that dictate requirements for the material they can receive. Operating requirements may include adherence to applicable chemical standards, guidance levels, criteria, policy or other bases to determine the suitability for receipt of historical fill or soil at a receiving facility. Such requirements may also specify sample frequency, location, sampling method, chemical analytes, or analytical methods. Receiving facility soil/fill sampling requirements often differ from standard remedial investigation protocol performed in the original environmental study of the property.

Given the variability of data requirements for receiving facilities, the wide range of receiving facility types, and the complexity of regulatory requirements and obligations, OER is seeking to assist government regulators and facility operators and their technical representatives to achieve compliance with regulatory requirements for disposal of historic fill and soil at receiving facilities for projects we administer. Further, we seek to ensure that all of the data and information that is developed in OER's regulatory programs (for instance, site environmental history and soil chemistry) is available to government regulators and to facility managers when making decisions on suitability for disposal to a receiving facility.

This document provides formal notification from OER of the availability of environmental information regarding the physical and chemical content of historical fill and soil that is proposed for transfer to a disposal, recycling or clean fill facility from a property located at:

1353 Flatbush Avenue, Brooklyn, New York
OER Site # 16CVCP070K

The above referenced property has undergone regulated environmental investigation and is the subject of remedial action work plan under the authority of OER. All environmental data and information generated during this regulatory process is available online in OER's Document Repository listed below. Be advised that many properties are also regulated under state environmental law, and additional data may be available from state agencies. OER reserves the right to share this information with applicable state regulators.

http://www.nyc.gov/html/oer/html/document-repository/document-repository.shtml

Note: when logged on to above URL, select the borough for the site (listed in the address above) and scroll through the list and select the address for the site (listed above). All documents are available in PDF format.

According to New York State DER-10 Technical Guidance for Site Investigation and Remediation, historical fill is non-indigenous fill material deposited on a property to raise its topographic elevation. The origin of historical fill is unknown but it is commonly known to contain ash from wood and coal combustion, slag, clinker, construction debris, dredge spoils, incinerator residue, and demolition debris. Historic fill is a regulated solid waste in the State of New York. Prior to making a determination regarding the suitability of historic fill and/or soil from this property for disposal at this receiving facility, **we strongly recommend that you review all of the data and information available for this property in our Document Repository** listed above. The repository includes:

- A Phase 1 history of use of the property;
- A Remedial Investigation Report for the property which includes:
    - Boring logs that describe physical observations of the historical fill material made by a trained environmental professional;
    - Chemical data for grab samples of historical fill collected during the remedial investigation;
- A Remedial Action Work Plan for the property.

If you have any questions, please contact Horace Zhang at (212) 788-8484 or Hzhang@dep.nyc.gov for more information.

Appendix 3
NYC VCP Signage

NYC Voluntary Cleanup Program

1353 Flatbush Avenue
Site #: 16CVCP070K

This property is enrolled in the New York City Voluntary Cleanup Program for environmental remediation. This is a voluntary program administered by the NYC Office of Environmental Remediation.

For more information,
log on to: www.nyc.gov/oer

Or scan with smart phone:

If you have questions or would like more information, please contact:

Shaminder Chawla at (212) 442-3007
or email us at brownfields@cityhall.nyc.gov

Appendix 4
Hazardous Waste Fee Exemption Fact Sheet

PlaNYC
NYC Office of Environmental Remediation

Exemption from the Hazardous Waste Program Fee

If your site is enrolled in the city Voluntary Cleanup Program and contains hazardous waste that will be excavated and disposed of offsite, OER can work with your development team to exempt your property from the $130/ton state Hazardous Waste Program fee. This exemption does not cover, and you remain liable for, the Special Assessment on Hazardous Waste (established by ECL§ 27-0923).

To qualify for an exemption from the Hazardous Waste Program Fee:

1. A site must be enrolled in the city Voluntary Cleanup Program;
2. Hazardous waste must result from remedial action set forth in a cleanup plan approved by OER; and
3. OER must oversee the cleanup.

Process for obtaining a Hazardous Waste Program Fee exemption:

For each VCP site, OER will submit three certifications to the New York State Department of Environmental Conservation (DEC):

1. OER will prepare a Notice of Potential Generation after a soil test shows a site contains hazardous waste. To prepare this Notice, you must provide your OER project manager with:

   - the site's EPA generator ID number;
   - the date of the soil test confirming hazardous waste;
   - the amount of hazardous waste in tons that you anticipate shipping offsite; and
   - the anticipated dates for the start and completion of remediation.

DEC must receive this form **before** hazardous waste is shipped from your site. Otherwise your claim for an exemption may be denied.

2. After hazardous waste has been removed from the site, OER will distribute a Certification of Hazardous Waste Generation to your project team which when filled out documents how the hazardous waste was managed. Once completed, it must be signed by the generator (or site owner) and the site's Qualified Environmental Professional and returned to your OER project manager with a copy to Shana Holberston sholbertson@dep.nyc.gov and Mark McIntyre mmcintyre@cityhall.nyc.gov.

3. OER will then issue a Certification of Remedial Action that Generated Hazardous Waste to DEC representing OER's approval of how a site managed its hazardous waste.

Upon OER's submission of the last two certifications to DEC, the agency will issue a written statement exempting an individual site from the Hazardous Waste Program Fee. OER will then notify the project of the exemption.

For further information, please contact:

Shana Holberton
Program Manager
(212) 788-3220
SHolberton@dep.nyc.gov

or

Mark McIntyre
General Counsel
(212) 788-3015
MMcintyre@cityhall.nyc.gov

Exemption from the Hazardous Waste Program Fee

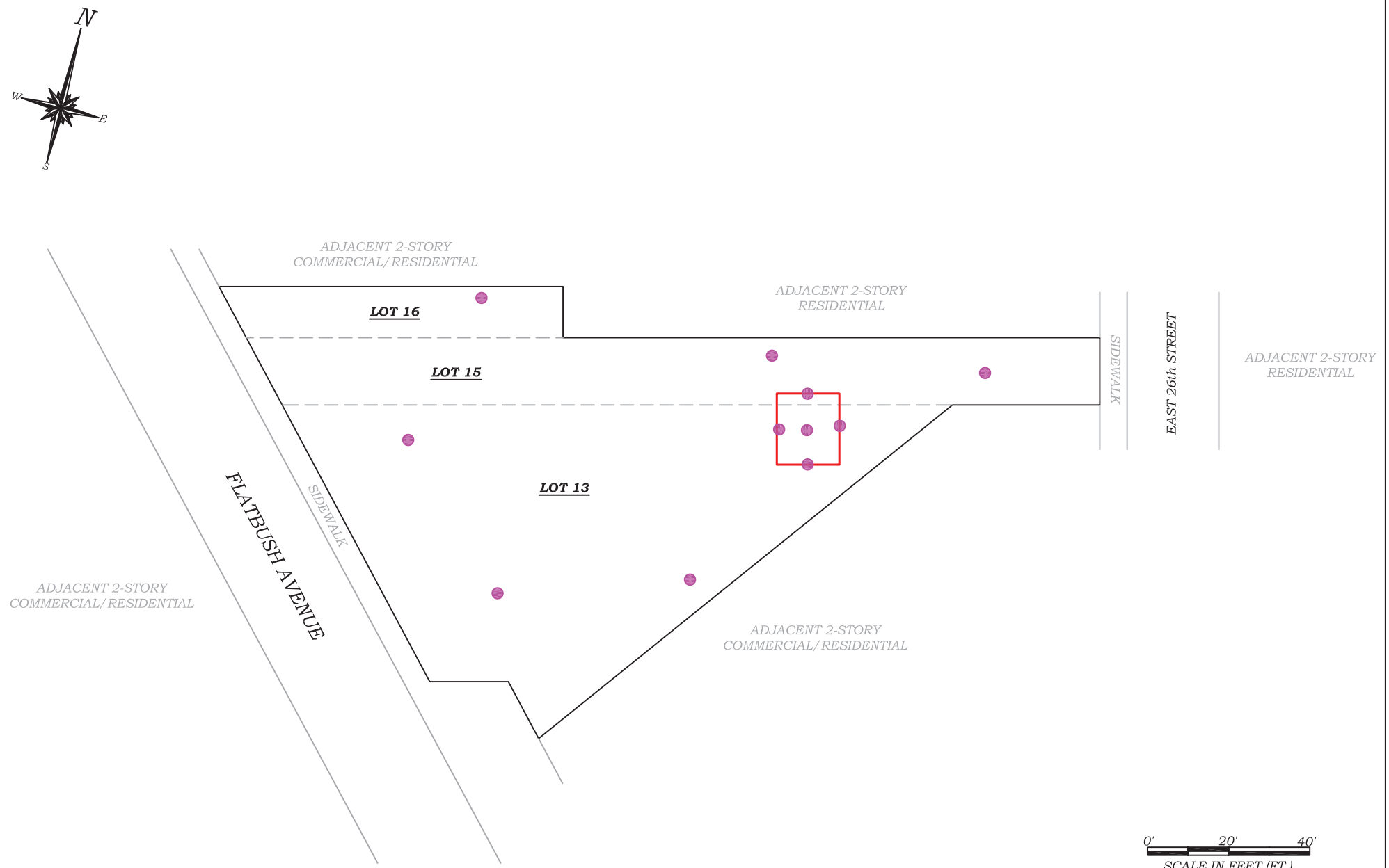
Ongoing Obligations:

Regardless of the Hazardous Waste Program Fee exemption, parties must:

- File a Hazardous Waste Annual Report with DEC by March 1 of each year if your site generated 15 tons of hazardous waste or more in the relevant calendar year. For details, see http://www.dec.ny.gov/chemical/8770.html To set forth the basis for an exemption from the Hazardous Waste Program Fee, put an X in the Exempt Remedial box in Box H of Section 1 of the Waste Generation and Management (GM) form and in the Comments Box (at the bottom of the form) include "New York City Voluntary Cleanup Program, VCP Site Number_____)"; and

- Make quarterly payments of the Special Assessment on Hazardous Waste to the state Department of Taxation and Finance. For details see: http://www.tax.ny.gov/bus/haz/hzrdwste.htm

Appendix 5
End-Point Sampling Map



LEGEND:

END POINT SAMPLING LOCATIONS

HYDRO TECH ENVIRONMENTAL CORP.

MAIN OFFICE:
77 ARKAY DRIVE, SUITE G
HAUPPAUGE, NEW YORK 11788
T (631)462-5866 F (631)462-5877

NYC OFFICE:
15 OCEAN AVENUE, 2nd Floor
BROOKLYN, NEW YORK 11225
T (718)636-0800 F (718)636-0900

www.hydrotechenvironmental.com

1353 Flatbush Avenue
Brooklyn, NY
HTE Job # 150298

Drawn By:	C.Q.
Reviewed By:	C.Q.
Approved By:	M.R
Date:	11/24/15
Scale:	AS NOTED

TITLE:

FIGURE 4: MAP OF END POINT SAMPLE LOCATIONS

Appendix 6
BIG Program Insurance Fact Sheet

FACT SHEET – BIG PROGRAM INSURANCE REQUIREMENTS

Investigation Grants – for a developer or site owner to be eligible for a BIG investigation grant, its environmental consultant(s) must be:

- a Qualified Vendor in the BIG Program; and
- maintain Professional Liability (PL) insurance of $1M per claim and annual aggregate.

Cleanup Grants – for a developer or site owner to be eligible for a BIG cleanup grant:

- Its general contractor or excavation/foundation contractor hired to perform remedial work must maintain Commercial General Liability (CGL) insurance of at least $1M per occurrence and $2M in the general aggregate. It is recommended that the general contractor or excavation/foundation contractor also maintain a Contractors Pollution Liability policy (CPL) of at least $1M per occurrence.

- Its subcontractors who are hired by the general contractor etc. to perform remedial work at a site, including soil brokers and truckers, must also maintain a CGL policy in the amount and with the terms set forth above. It is recommended that subcontractors also maintain a CPL policy in the amount and with the terms set forth above.

  The CGL policy, and the CPL policy if in force, must list the city, EDC and BRS as additional insureds, include completed operations coverage and be primary and non-contributory to any other insurance the additional insureds may have.

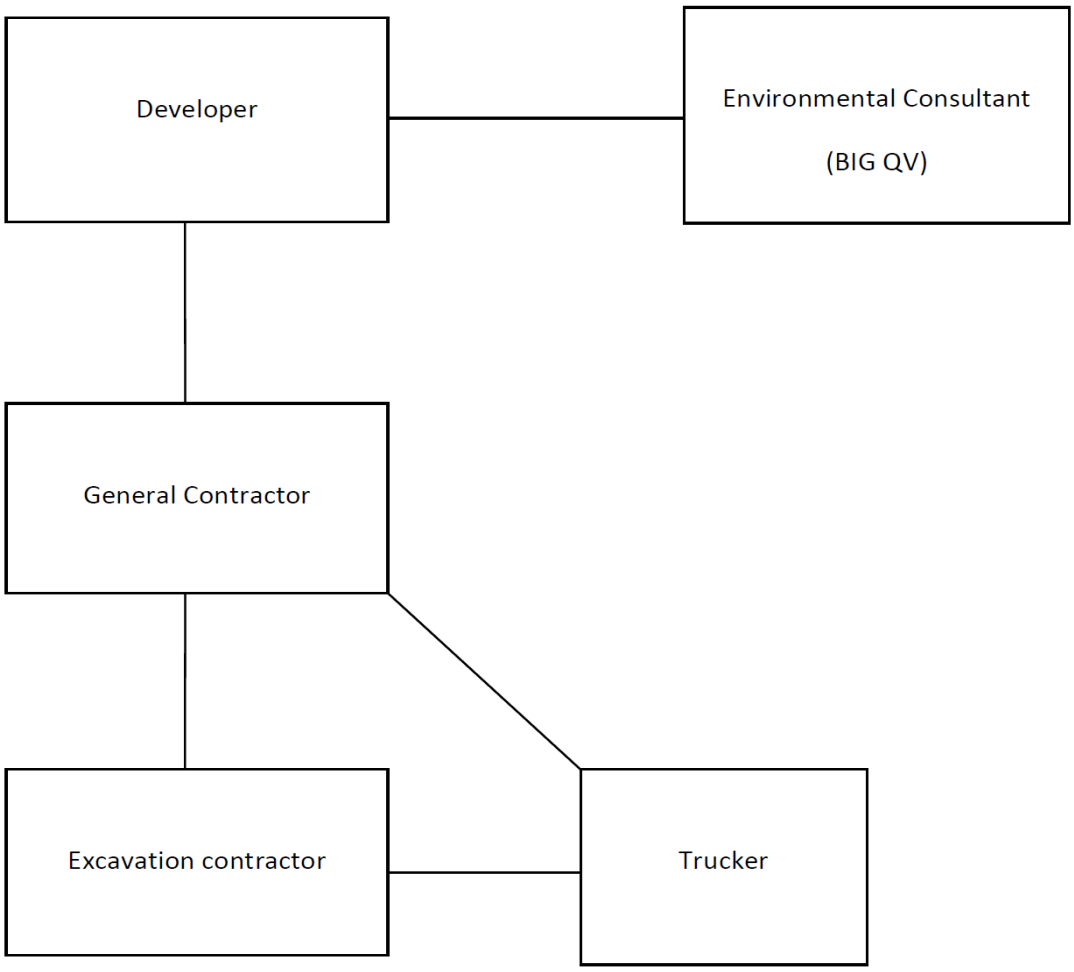
- Its environmental consultant(s) hired to oversee the cleanup must be:
  a. a BIG Qualifed Vendor; and
  b. maintain Professional Liability (PL) insurance of $1M per claim and annual aggregate.

If, in the alternative, the developer hires its environmental consultant to perform the cleanup, the environmental consultant must maintain CGL insurance in the amount and with the terms set forth above. It is recommended that the environmental consultant also maintain CPL coverage in the amount and with the terms set forth in the first two bulleted items listed above.

A schematic presenting the contractual relationships described above appears on page 2. Parties who must be named as Additional Insureds on Cleanup Grant insurance policies (CGL and CPL) are presented on page 3.

Example of Contractual Relationships for Cleanup Work

The Office of Environmental Remediation's Voluntary Cleanup Plan program requires applicants to identify the parties who are engaged in active remediation of their sites including: the General Contractor hired to remediate and/or the excavation contractor hired to excavate soil from the site and the trucking firm(s) that remove soil from the site for disposal at approved facilit(ies).



The chart above shows contractual relationships that typically exist for projects that are enrolled in the Voluntary Cleanup Program.

BIG Program Additional Insureds

The full names and addresses of the additional insureds required under the Required CGL Policy and recommended CPL Policy are as follows:

"City and its officials and employees"
New York City Mayor's Office of Environmental Remediation
253 Broadway, 14th Floor
New York, NY 10007

"NYC EDC and its officials and employees"
New York City Economic Development Corporation
110 William Street
New York, NY 10038

"BIG Grant Administrator and its officials and employees"
Brownfield Redevelopment Solutions, Inc.
739 Stokes Road, Units A & B
Medford, NJ 08055

Appendix 7
Daily Report Template

Office of Environmental Remediation

Daily Status Report Template
Version 1.3

Generic Template for Daily Status Report

Instructions

The Daily Status Report submitted to OER should adhere to the following conventions:

- Remove this cover sheet prior to editing.
- Remove all the red text and replace with site-specific information.
- Submit the final version as a Word or PDF file.

Daily Status Reports

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

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

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

DAILY STATUS REPORT

Prepared By: Enter Your Name Here

WEATHER	Snow		Rain		Overcast		Partly Cloudy	X	Bright Sun	
TEMP.	< 32		32-50		50-70	X	70-85		>85	

VCP Project No.:	14CVCP000M	E-Number Project No.:	14EHAN000M	Date:	01/01/2014
Project Name:	Name or Address				

Consultant: Person(s) Name and Company Name	Safety Officer: Person(s) Name and Company Name
General Contractor: Person(s) Name and Company Name	Site Manager/ Supervisor: Person(s) Name and Company Name

Work Activities Performed (Since Last Report):
Provide details about the work activities performed.

Working In Grid #: A1, B1, C1

Samples Collected (Since Last Report):
No samples collected or provide details

Air Monitoring (Since Last Report):
No air monitoring performed or provide details
Prestart Conditions – PID = 0.0 ppm, Dust = 0.000
High Conditions – PID = 0.0 ppm, Dust = 0.000

Problems Encountered:
No problems encountered or provide details

Planned Activities for the Next Day/ Week:
Provide details about the work activities planned for the next day/ week.

									Example:	
Facility # Name/ Location Type of Waste Solid <u>Or</u> Liquid	Facility # Name Location Type of Waste Solid *<u>Or</u>* Liquid		Facility # Name Location Type of Waste Solid *<u>Or</u>* Liquid		Facility # Name Location Type of Waste Solid *<u>Or</u>* Liquid		Facility # Name Location Type of Waste Solid *<u>Or</u>* Liquid		# # # # # # # Clean Earth Carteret, NJ petroleum soils Solid	
(Trucks, Cu.Yds. <u>Or</u> Gallons)	Trucks	Cu. Yds. *<u>Or</u>* Gallons	Trucks	Cu. Yds. *<u>Or</u>* Gallons	Trucks	Cu. Yds. *<u>Or</u>* Gallons	Trucks	Cu. Yds. *<u>Or</u>* Gallons	Trucks	Cu. Yds.
Today									5	120
Total									25	600

NYC Clean Soil Bank		Receiving Facility: Name/ Address (Approved by OER)			
Tracking No.:	13CCSB000				
Today	Trucks 5	Cu. Yds. 25	Total	Trucks 120	Cu. Yds. 600

<u>Site Grid Map</u>

Insert the site grid map here

Photo Log

Photo 1 – provide a caption	Insert Photo Here – Photo of the entire site
Photo 2 – provide a caption	Insert Photo Here – Photo of the work activities performed
Photo 3 – provide a caption	Insert Photo Here – Photo of the work activities performed

Appendix 8
Monthly Report Template

WEEKLY/MONTHLY STATUS REPORT

Prepared By: Enter Your Name Here

VCP Project No.:	14CVCP000M	E-Number Project No.:	14EHAN000M	Date:	01/01/2014

Project Name:	Name or Address

Project Updates (Since Last Report):
Provide details about the work activities performed.

Problems Encountered:
No problems encountered or provide details

Planned Activities for the Next three months:
Provide details about the future work activities.

Photo Log

Photo 1 – provide a caption	Insert Photo Here – Photo of the entire site
Photo 2 – provide a caption	Insert Photo Here – Photo of the work activities performed
Photo 3 – provide a caption	Insert Photo Here – Photo of the work activities performed

Appendix 9
Soil Disposal and Trucking Log Sheet

Shipment Date	Manifest Number	Transporter Name/Truck Name	License Plate	On-Site Location (approx. depth)	Off-Site Disposal Facility	Tonnage
8/25/2013	66357	ABC Trucking/201	NJ-AP458	WC-1(0-8')	Jones Landfill	32.90

Appendix 10
Vapor Barrier Specifications

Yellow Guard®

20 MIL VAPOR BARRIER

Husky® Yellow Guard® premium vapor barriers are waterproofing membranes manufactured using top-quality polyethylene (polyolefin) resins. Husky® Yellow Guard® vapor barriers are manufactured to be used in contact with soil and granular fill under concrete slabs, beams, and footings, and provide exceptionally low water vapor permeance. Husky® Yellow Guard® vapor barriers are manufactured by Poly-America, an industry leader in the manufacture of polyethylene films. Poly-America utilizes state-of-the-art processing equipment.

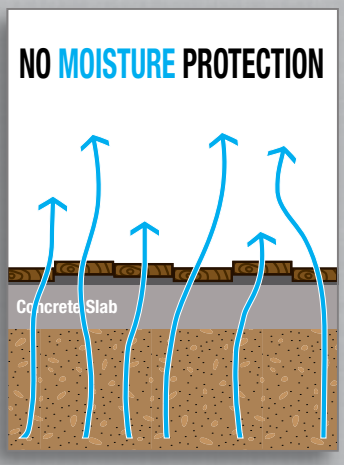
VAPOR BARRIER HIGHLIGHTS

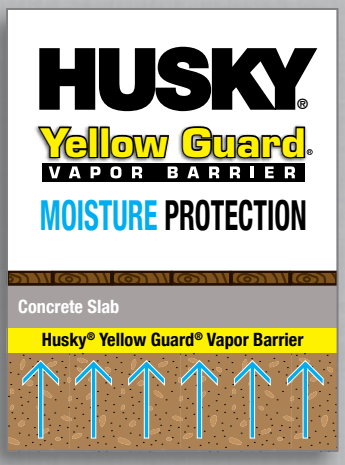
- Developed for use as a durable vapor barrier.
- Multi-layer product formulated from top-quality polyethylene (polyolefin) resins.
- Exceeds industry-standard ASTM E 1745 Class A, Class B, and Class C specifications.
- Restricts migration of soil gases such as radon and methane.
- Exceptionally low water vapor permeance, ten times lower than industry-standard ASTM E 1745 Class A requirement.
- Manufactured by Poly-America on state-of-the-art manufacturing equipment with full-time on-line quality monitoring and routine laboratory testing.
- Maintains low water vapor permeance even after exposure to severe field conditions.
- Outstanding tensile properties and puncture resistance.
- Excellent resistance to low-temperature brittleness.
- Available nationwide.

Manufacturing Quality Control & Quality Assurance

All resins, additives, and concentrates for use in Husky® Yellow Guard® vapor barrier must meet Poly-America's stringent raw material specifications. Husky® Yellow Guard® vapor barrier is manufactured with continuous process-control monitoring and is routinely tested in Poly-America's state-of-the-art laboratory during and after production.

In addition, Husky® Yellow Guard® vapor barrier has been tested by accredited, independent laboratories to ensure that it meets ASTM E 1745 Class A, Class B, and Class C specifications.





PROPERTIES OF 20 MIL HUSKY® YELLOW GUARD® VAPOR BARRIER

Properties	Test Method	ASTM E 1745 Class A Requirements	Yellow Guard® Vapor Barrier Test Result*	Measures
Permeance	ASTM F 1249	0.1 perms	0.0073 perms/**0.0033 WVTR	Resistance to water vapor
Puncture Resistance	ASTM D 1709 Method B	2200 g	3577 g	Impact energy required to cause failure
Tensile Strength	ASTM D 882	45.0 lbf/in	101.5 lbf/in	Force required to break/rupture film
Permeance After Conditioning	ASTM E 154			Resistance to water vapor after:
(ASTM F 1249)	Section 8	0.1 perms	0.0056 perms	-wetting, drying, and soaking
	Section 11	0.1 perms	0.0066 perms	-heat conditioning
	Section 12	0.1 perms	0.0068 perms	-low-temperature conditioning
	Section 13	0.1 perms	0.0073 perms	-soil organism exposure
Methane Transmission Rate	ASTM D 1434		94.27 mL (STP)/(m^2 • day)	Transmission through a membrane
Radon Permeability Coefficient			8.3 x 10^{-14} m^2/sec	
Thickness			20 mils	
Roll Dimensions			14 ft x 105 ft	
Roll Weight			142.4 lbs	

*All values are typical values and may vary within industry tolerances.
**WVTR (Water Vapor Transmission Rate) in g/(100 in^2 • day)

Perm = grains/(ft^2 • hr • inHg)

Installation

Installation of Husky® Yellow Guard® vapor barrier, including placement, lap joints, pipe penetrations, protection, repair, and suggested field check list, shall be in accordance with ASTM E 1643 standard practice and the project plans and specifications.

Availability

Husky® Yellow Guard® 20 mil vapor barriers are available nationwide. Visit www.yellowguard.com for more information.

Limited Replacement Warranty

Poly-America provides a limited replacement warranty on Husky® Yellow Guard® vapor barrier representing that the vapor barrier is free from material defects for a period of 1 year from the date of sale. The specific details of Poly-America's limited replacement warranty are available at http://www.yellowguard.com/limitedwarranty.pdf.

Poly-America

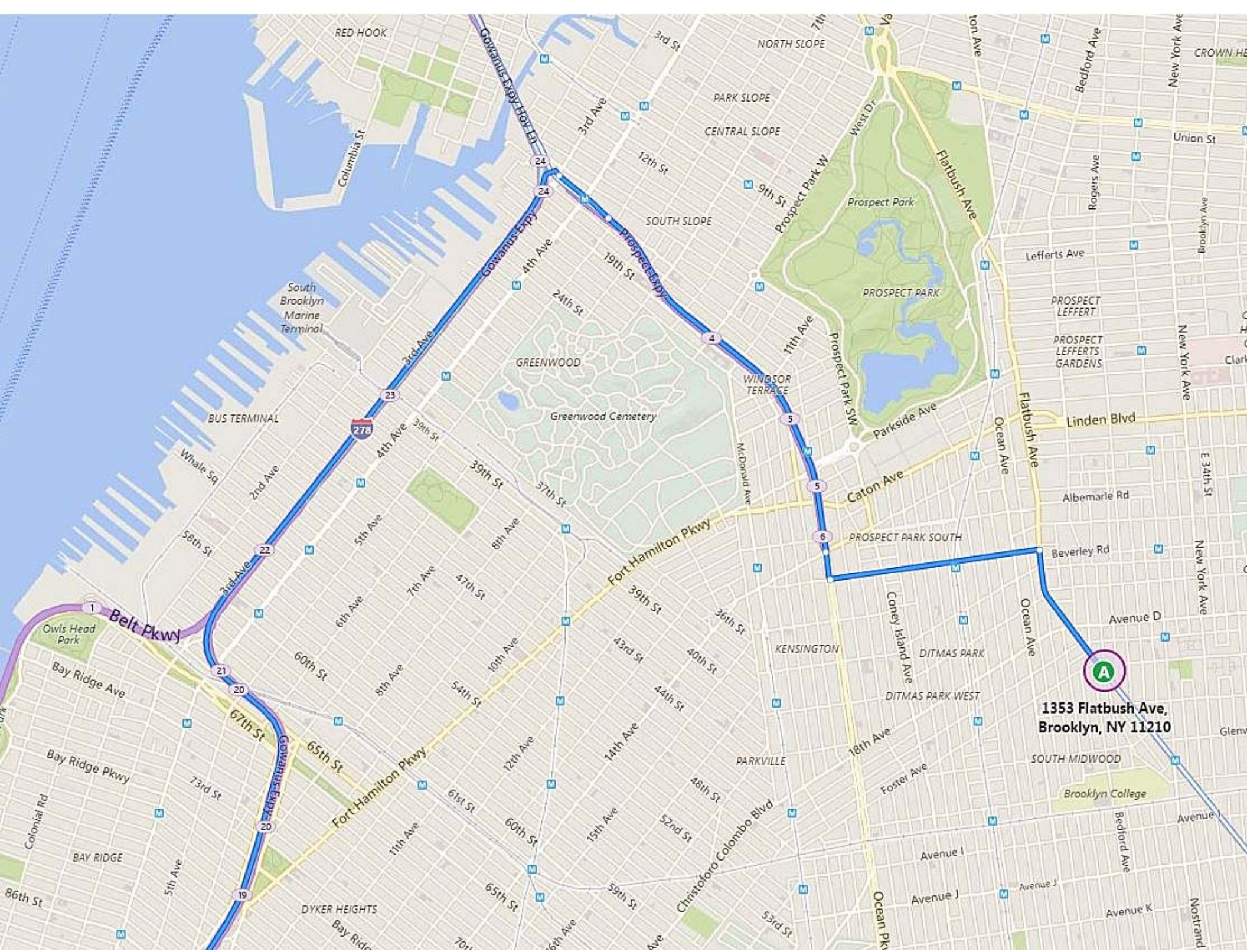
2000 W. Marshall Dr. • Grand Prairie, TX 75051

800-527-3322 • 972-337-7654 • Fax 972-337-7016 • www.yellowguard.com • yellowguard@poly-america.com

The information provided herein has been compiled by Poly-America, L.P. and to the best of our knowledge accurately represents Poly-America's Yellow Guard® vapor barriers at the time of publication. This publication is offered "as is," for preliminary planning purposes only, without any warranties of any kind. Final determination of suitability of this information or these products for the use contemplated and its manner of use is the sole responsibility of the end user. Poly-America, L.P. assumes no liability in connection with the use of this information and these products. This information is subject to change without notice.

57-023-0094 Rev 2/16

Appendix 11
Truck Route



1353 Flatbush Ave,
Brooklyn, NY 11210
A
RED HOOK
NORTH SLOPE
PARK SLOPE
CENTRAL SLOPE
SOUTH SLOPE
Prospect Park
PROSPECT PARK
PROSPECT LEFFERT
PROSPECT LEFFERTS GARDENS
GREENWOOD
Greenwood Cemetery
WINDSOR TERRACE
PROSPECT PARK SOUTH
KENSINGTON
DITMAS PARK
DITMAS PARK WEST
PARKVILLE
SOUTH MIDWOOD
Brooklyn College
South Brooklyn Marine Terminal
BUS TERMINAL
Owls Head Park
BAY RIDGE
DYKER HEIGHTS
Gowanus Expy
Prospect Expy
Belt Pkwy
Fort Hamilton Pkwy
Flatbush Ave
Linden Blvd
Caton Ave
Parkside Ave
Prospect Park W
Prospect Park SW
Coney Island Ave
Ocean Ave
Bedford Ave
New York Ave
Union St
Lefferts Ave
Albemarle Rd
Beverley Rd
Avenue D
Avenue I
Avenue J
Avenue K
Foster Ave
Bay Ridge Ave
Bay Ridge Pkwy
Whale Sq
Columbia St
Colonial Rd
Christoforo Colombo Blvd
McDonald Ave
3rd Ave
4th Ave
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1353 FLATBUSH AVENUE

BROOKLYN, NEW YORK

Remedial Action Work Plan

E-Designation Site Number: E-233
OER Project Number: 16EHAZ157K
NYC VCP Project Number 16CVCP070K

Prepared for:
Hello Living / Hello Flatbush, LLC
33 35th Street – 6th Floor
Brooklyn, NY 11232

Prepared by:
HAKS
40 Wall Street, 11th Floor
New York, New York 10005

APRIL 2016

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REMEDIAL ACTION WORK PLAN

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FIGURES

Figure 1: Site Boundary Map

Figure 2: Site Location Map

Figure 3: Surrounding Land Usage

Figure 4: Map of End-point Sample Locations

Figure 5: Site Excavation Diagram

Figure 6: Map of Soil/Fill Reuse and Backfill Placement Locations

Figure 7: Site-wide Cover System Plan

Figure 8: Cover System Detail Diagram

Figure 9: Vapor Barrier Layout Map

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APPENDICES

Appendix 1: Site Plan and Development Plans

Appendix 2: Historical Environmental Reports

Appendix 3: Citizen Participation Plan

Appendix 4: Soil/Materials Management Plan

Appendix 5: Construction Health and Safety Plan

Appendix 6: Sustainability Statement

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LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
AS/SVE	Air Sparging/Soil Vapor Extraction
BOA	Brownfield Opportunity Area
CAMP	Community Air Monitoring Plan
C/D	Construction/Demolition
COC	Certificate of Completion
CQAP	Construction Quality Assurance Plan
CSOP	Contractors Site Operation Plan
DCR	Declaration of Covenants and Restrictions
ECs/ICs	Engineering and Institutional Controls
HASP	Health and Safety Plan
IRM	Interim Remedial Measure
VCA	Voluntary Cleanup Agreement
MNA	Monitored Natural Attenuation
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 DEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYS DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
ORC	Oxygen-Release Compound

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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

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CERTIFICATION

I, Tarek Z. Khouri,P.E., am a Registered Architect/Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the 1353 Flatbush Avenue Site, site number 16EHAZ157K. I certify to the following:

- I have reviewed this document and the Stipulation List, to which my signature and seal are affixed.
- Engineering Controls developed for this remedial action were designed by me or a person under my direct supervision and designed to achieve the goals established in this Remedial Action Work Plan for this site.
- The Engineering Controls to be constructed during this remedial action are accurately reflected in the text and drawings of the Remedial Action Work Plan and are of sufficient detail to enable proper construction.
- 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.

Tarek Z. Khouri
Name

086611
PE License Number

Signature

25 April 2016
Date

I, Mark Robbins, am a Qualified Environmental Professional as defined in §43-140. I have primary direct responsibility for implementation of the remedial action for the 1353 Flatbush Avenue Site, site number 16EHAZ157K. I certify to the following:

- 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.

Mark E. Robbins
QEP Name

QEP Signature

4/25/16
Date

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EXECUTIVE SUMMARY

Hello Living / Hello Flatbush, LLC is working with the NYC Office of Environmental Remediation (OER) to investigate and remediate a 9,744-square foot site located at 1353 Flatbush Avenue in 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 Background

The Site is located at 1353 Flatbush Avenue in the Flatbush section of Brooklyn, New York and is identified as Block 5227 and Lots 13, 15 and 16 on the New York City Tax Map. A map of the site boundary is shown in Figure 1. Figure 2 shows the site location. The Site is 9,744 square feet in area and is bounded by Flatbush Avenue to the west, East 26th Street to the east, a 2-story mixed use building to the north and 2-story mixed use building to the south. Currently, the Site is a vacant lot.

Summary of Redevelopment Plan

The proposed future use of the Site will consist of a new 7-story, mixed use building with a full basement. The basement and first floor will contain retail space with the 2nd through 7th floors containing 35 residential units. The building footprint will cover 6,009 square feet, 62% of the site. The remaining portion of the site will be used for a rear yard and paved walkways.

The proposed development will involve the excavation of the building footprint to a maximum depth of 14.5 feet below grade and excavation of a minimum of 2 feet across the rear yard and walkways. Groundwater was encountered at approximately 24 feet below grade at the Site; therefore dewatering is not anticipated during excavation. Approximately 5,255 tons of soil will be excavated and removed from this Site.

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Layout of the proposed site development is presented in Appendix 1**.** The current zoning designation is C2-4/R7A. 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 Surrounding Property

The area surrounding the Site consists of a mix of residential and commercial properties. An evaluation of the United States Geological Survey (USGS) 7-½ Minute Topographic Map containing the properties and OER's *SPEED* application indicate there are two (2) sensitive receptors present within a 0.125-mile radius of the Subject Property. These sensitive receptors are The Flatbush YMCA of Greater New York located at 1401 Flatbush Avenue and Kids Etcetera Day Care Center, Inc. located approximately 300 feet northwest of the Site at 1331 Flatbush Avenue. No other sensitive receptors (such as schools, hospitals or day-care facilities) are present within a 500-foot radius of the Site. The surrounding land usages are presented in Figure 3.

Summary of Past Site Uses and Areas of Concern

Based upon the review of a Phase I Environmental Site Assessment (ESA) Report prepared by Singer Environmental Group (November 2004) for Lot 16, a Site history was established. According to Sanborn Fire Rate Insurance Maps, the Site was undeveloped from as early as 1907. The 1930 and 1950 maps show Lot 13 as a filling station with five gasoline tanks. By 1969 the tanks are no longer shown and the filing station replaced with 2 commercial buildings. By 1977 one of the commercial buildings is occupied by an auto repair shop and Lot 16 is labeled as parking. This configuration remained until 1992 when the auto repair was replaced by used auto sales.

Based on the Phase I ESA, a limited Subsurface Investigation was performed by Associated Environmental Services, LTD. (AES) in August 2005 which revealed the presence of subsurface anomalies consistent with underground storage tanks (USTs). Tank closure activities occurred from April to June 2006 and included the removal of five 550-gallon gasoline USTs and one

300-gallon fuel oil UST. Due to evidence of soil contamination in the vicinity of the tanks, NYSDEC was notified and Spill Nos. 06-00423 and 06-00910 assigned. Approximately 114.85 tons of contaminated soil was removed from the Site and properly disposed of. Eight end-point samples were collected from the sidewalls and bottom of the five gasoline USTs excavation pit and two samples from the area of the fuel oil UST. Based on the analytical results of the end-point samples, both spill cases were closed by NYSDEC on July 10, 2006.

The AOCs identified for this Site include:

1. Historical use of Site as a filling station, auto repair, and auto sales.

Summary of Work Performed under the Remedial Investigation

Based on the December 2015 Remedial Investigation Work Plan submitted by Hydro Tech to OER, the following scope of work was performed at the Site:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Conducted a Ground Penetrating Radar (GPR) survey of the Site to identify subsurface structures (i.e. tanks, building foundations, utilities, etc.);
3. Installed six (6) soil borings across the entire project Site, and collected twelve (12) soil samples for chemical analysis from the soil borings to evaluate soil quality;
4. Installed three (3) groundwater monitoring wells throughout the Site to establish groundwater flow and collected three (3) groundwater samples for chemical analysis to evaluate groundwater quality;
5. Installed four (4) soil vapor probes throughout the Site and collected four (4) samples for chemical analysis; and
6. Collected one (1) outdoor ambient air sample for chemical analysis.

Summary of Findings of the Remedial Investigation

1. No evidence of USTs was observed at the Site.

2. Elevation of the property ranges from 27.04 to 28.89 feet.

3. Depth to groundwater ranges from 24.20 to 24.81 feet below grade at the Site.

4. Groundwater flow is generally from northeast to southwest beneath the Site.

5. Bedrock was not encountered within 35 feet below grade at the Site.

6. The stratigraphy of the site, from the surface down, consists of 2 feet of brown silty sand, underlain by approximately 2 to 4 feet of light brown sandy clay, underlain by approximately 30 feet of tan coarse-grained sand.

7. Soil/fill samples results were compared to NYSDEC Unrestricted Use Soil Cleanup Objectives and Restricted Residential Soil Cleanup Objectives (SCOs) as presented in 6NYCRR Part 375-6.8 and CP51. Soil/fill samples collected during the RI showed no detectable concentration of PCBs. Three volatile organic compounds (VOCs) including acetone (max. 0.11 milligrams per kilogram [mg/kg]), 1,2,4-trimethylbenzene (max. 4 mg/kg) and methyl ethyl ketone (max. 0.14 mg/kg) were detected in two deep soil samples at concentrations exceeding Unrestricted Use SCOs. Tetrachloroethylene was also detected at 0.026 mg/kg in one deep sample, but below Unrestricted Use SCOs. Several semi-volatile organic compounds (SVOCs) consisting of polycyclic aromatic hydrocarbon (PAH) compounds were detected in three shallow soil samples at concentrations exceeding Restricted Residential Use SCOs, including benz(a)anthracene (max. 110 mg/kg), benzo(a)pyrene (max. 99 mg/kg), benzo(b)fluoranthene (max. 100 mg/kg), benzo(k)fluoranthene (max. 73 mg/kg), chrysene (max. 120 mg/kg), dibenzo(a,h)anthracene (max. 16 mg/kg), fluoranthene (max. 270 mg/kg), indeno(1,2,3-cd)pyrene (max. 65 mg/kg), phenanthrene (max. 190 mg/kg) and pyrene (max. 220 mg/kg). One SVOC, dibenzofuran (max. 11 mg/kg), was detected in two shallow samples at a concentration exceeding Unrestricted Use SCO. The pesticide, 4,4'-DDT (max. 0.011 mg/kg), was detected in two shallow samples and two deep samples at concentrations exceeding Unrestricted Use SCO. Several metals including arsenic (max. 18.6 mg/kg), barium (max. 451 mg/kg), cadmium (max. 3.71 mg/kg), copper (max. 1,380 mg/kg), lead

(max. 2,660 mg/kg) and mercury (max. 1.21 mg/kg) were detected in three shallow soil samples at concentrations exceeding Restricted Residential Use SCOs. Nickel (max. 42.9 mg/kg) and zinc (max. 541 mg/kg) were also detected at concentrations exceeding Unrestricted Use SCOs.

8. Groundwater samples results were compared to New York State 6NYCRR Part 703.5 Class GA groundwater quality standards (GQS). Groundwater samples collected during the investigations showed no PCBs or pesticides in any sample. Three VOCs were detected above GQS including isopropylbenzene (25 µg/L) and n-propylbenzene (39 µg/L) in MW-2, and chloroform (max. 11 µg/L) in MW-3. Four SVOCs were detected above GQS in MW-3, including benz(a)anthracene (0.03 µg/L), benzo(b)fluoranthrene (0.02 µg/L), benzo(k)fluoranthrene (0.02 µg/L) and chrysene (0.02 µg/L). Several dissolved metals were identified in groundwater but only manganese (max. 1.1 µg/L) and sodium (max. 143 µg/L) exceeded their respective GQS.

9. Soil vapor results collected during the RI were compared to compounds listed in Table 3.1 Air Guideline Values Derived by the NYSDOH located in the New York State Department of Health Final Guidance for Evaluating Soil Vapor Intrusion dated October 2006. Soil vapor results collected during the RI showed relatively low-levels of petroleum related VOCs. Total concentrations of petroleum-related VOCs (BTEX) ranged from 12.83 µg/m^3 to 38.79 µg/m^3. Toluene was the highest detected petroleum-related compound with a concentration of 17.2 µg/m^3 in SV-3. Chlorinated VOCs were also detected with tetrachloroethylene (PCE) detected at a maximum of 6.05 µg/m^3, 1,1,1-trichloroethane (TCA) detected at 0.383 µg/m^3 and trichloroethylene (TCE) detected at a maximum of 0.081 µg/m^3. Carbon tetrachloride was not detected in any of the samples. Concentrations for PCE, TCE and 1,1,1-trichloroethane (TCA) were below the monitoring level ranges established within the State DOH soil vapor guidance matrix.

Summary of the Remedial Action

The proposed remedial action achieves all of the remedial action goals established for the project. The proposed remedial action is effective in both the short-term and long-term and

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reduces mobility, toxicity and volume of contaminants and uses standard 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 the Citizen Participation Plan.
2. Perform a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Selection of Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility(s).
6. Excavation and removal of soil/fill exceeding Track 1 Unrestricted Use SCOs. For development purposes, the building footprint will be excavated to a maximum depth of 14.5 feet for the new building's cellar with 2 feet of soil excavated from the rear landscaped/capped areas. An additional hot spot will be excavated to approximately 6 feet below grade in the vicinity of RI soil sample SP-6. Approximately 5,255 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 in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials.
9. Removal of all underground storage tanks that are encountered during soil/fill removal actions. Registration of tanks and reporting of any petroleum spills associated with

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UST's and appropriate closure of these petroleum spills 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 six (6) end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
12. Demarcation of residual soil/fill in landscaped areas.
13. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
15. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.
16. 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.

If Track 1 Unrestricted Use SCOs are not achieved, the following construction elements implemented as part of new development will constitute Engineering and Institutional Controls:

17. As part of development, installation of a vapor barrier system consisting of vapor barrier beneath the building slab and outside of sub-grade foundation sidewalls to mitigate soil vapor migration into the building. The vapor barrier system will consist of a minimum 20-mil vapor barrier below the slab throughout the full building area and a minimum 20-mil vapor barrier outside all sub-grade foundation sidewalls. All welds, seams and

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penetrations will be properly sealed to prevent preferential pathways for vapor migration.

18. As part of development, construction and maintenance of an engineered composite cover consisting of the 2.5-foot thick concrete building slab, 4-inch concrete paved walkways and a minimum of 2-feet of clean soil in all open space and landscaped areas to prevent human exposure to residual soil/fill remaining under the Site.

19. If Track 1 SCOs are not achieved, submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.

20. If Track 1 SCOs are not achieved, the property will continue to be registered with an E-Designation at 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.

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COMMUNITY PROTECTION STATEMENT

The NYC Office of Environmental Remediation (OER) provides governmental oversight for the cleanup of contaminated property in NYC. This Remedial Action Work Plan ("cleanup plan") describes the findings of prior environmental studies, shows the location of identified 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.

Project Information:

- Site Address: 1353 Flatbush Avenue, Brooklyn, NY 11210
- NYC Voluntary Cleanup Program Project Number: 16CVCP070K

Project Contacts:

- OER Project Manager: Sarah Pong, 212-788-8841
- Site Project Manager: A.J. Infante, 718-636-0800
- Site Safety Officer: A.J. Infante, 718-636-0800
- Online Document Repository:

http://www.nyc.gov/html/oer/html/document-repository/document-repository.shtml

Remedial Investigation and Cleanup Plan: Under the oversight of the NYC OER, a thorough 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 to identify

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

Health and Safety Plan: This cleanup plan includes a Construction Health and Safety Plan (CHASP) that is designed to protect community residents and on-Site workers. The elements of this RAWP are in compliance with applicable safety requirements of the United States Occupational Safety and Health Administration (OSHA). This RAWP includes many protective elements including those discussed below.

Site Safety Coordinator: This project has a designated Site safety coordinator to implement the CHASP. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site safety coordinator is identified at the beginning of this Community Protection Statement.

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 to workers performing specific tasks including removing contaminated material and installing cleanup systems in contaminated areas.

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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 or CAMP. Results will be regularly reported to the NYC Office of Environmental Remediation. 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 applicable NYC noise control standards. If you observe problems in these areas, please contact the onsite Project Manager or NYC Office of Environmental Remediation Project Manager listed on the first page of this Community Protection Statement document.

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.

Stormwater Management: To limit the potential for soil erosion and discharge, this cleanup plan has provisions for stormwater management. The main elements of the stormwater 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 will conform to requirements of the NYC Department of Buildings.

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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 and provides project contact names and numbers, and a link to the document repository where 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 or the NYC Office of Environmental Remediation Project Manager listed on the first page of this Community Protection Statement document, 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, odor 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,

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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 applicable 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 the 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 / will be 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 the Remedial Action Report) that will be available for public review online. A link to the online document repository and the public library with Internet access nearest the Site are listed on the first page of this Community Protection Statement document

Long-Term Site Management: If long-term protection is needed 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 Office of Environmental Remediation.

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Requirements that the property owner must comply with are defined either in the property's deed or established through a city environmental designation registered with the Department of Buildings. A certification of continued protectiveness of the cleanup will be required from time to time to show that the approved cleanup is still effective.

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REMEDIAL ACTION WORK PLAN

1.0 PROJECT BACKGROUND

Hello Living / Hello Flatbush, LLC is working with the NYC Office of Environmental Remediation (OER) in the New York City Voluntary Cleanup Program and in the "E" Designation Program to investigate and remediate a 9,744-square foot site located at 1353 Flatbush Avenue in the Flatbush 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) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, and complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 SITE LOCATION AND BACKGROUND

The Site is located at 1353 Flatbush Avenue in the Flatbush section of Brooklyn, New York and is identified as Block 5227 and Lots 13, 15 and 16 on the New York City Tax Map. A map of the site boundary is shown in Figure 1. Figure 2 shows the site location. The Site is 9,744 square feet in area and is bounded by Flatbush Avenue to the west, East 26th Street to the east, a 2-story mixed use building to the north and a 2-story mixed use building to the south. Currently, the Site is a vacant lot.

1.2 REDEVELOPMENT PLAN

The proposed future use of the Site will consist of a new 7-story, mixed use building with a full basement. The basement and first floor will contain retail space with the 2nd through 7th

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floors containing 35 residential units. The building footprint will cover 6,009 square feet, 62% of the site. The remaining portion of the site will be used for a rear yard and paved walkways.

The proposed development will involve the excavation of the building footprint to a maximum depth of 14.5 feet below grade and excavation of a minimum of 2 feet across the rear yard and walkways. Groundwater was encountered at approximately 24 feet below grade at the Site; therefore dewatering is not anticipated during excavation. Approximately 5,255 tons of soil will be excavated and removed from this Site.

Layout of the proposed site development is presented in Appendix 1**.** The current zoning designation is C2-4/R7A. 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 surrounding the Site consists of a mix of residential and commercial properties. An evaluation of the United States Geological Survey (USGS) 7-½ Minute Topographic Map containing the properties and OER's *SPEED* application indicate there are two (2) sensitive receptors present within a 0.125-mile radius of the Subject Property. These sensitive receptors are The Flatbush YMCA of Greater New York located at 1401 Flatbush Avenue and Kids Etcetera Day Care Center, Inc. located approximately 300 feet northwest of the Site at 1331 Flatbush Avenue. No other sensitive receptors (such as schools, hospitals or day-care facilities) are present within a 500-foot radius of the Site.

Figure 3 shows the surrounding land usage.

1.4 SUMMARY OF PAST USES OF SITE AND AREAS OF CONCERN

Based upon the review of a Phase I Environmental Site Assessment (ESA) Report prepared by Singer Environmental Group (November 2004) for Lot 16, a Site history was established. According to Sanborn Fire Rate Insurance Maps, the Site was undeveloped from as early as 1907. The 1930 and 1950 maps show Lot 13 as a filling station with five gasoline tanks. By 1969

the tanks are no longer shown and the filing station replaced with 2 commercial buildings. By 1977 one of the commercial buildings is occupied by an auto repair shop and Lot 16 is labeled as parking. This configuration remained until 1992 when the auto repair was replaced by used auto sales.

Based on the Phase I ESA, a limited Subsurface Investigation was performed by Associated Environmental Services, LTD. (AES) in August 2005 which revealed the presence of subsurface anomalies consistent with underground storage tanks (USTs). Tank closure activities occurred from April to June 2006 and included the removal of five 550-gallon gasoline USTs and one 300-gallon fuel oil UST. Due to evidence of soil contamination in the vicinity of the tanks, NYSDEC was notified and Spill Nos. 06-00423 and 06-00910 assigned. Approximately 114.85 tons of contaminated soil was removed from the Site and properly disposed of. Eight end-point samples were collected from the sidewalls and bottom of the five gasoline USTs excavation pit and two samples from the area of the fuel oil UST. Based on the analytical results of the end-point samples, both spill cases were closed by NYSDEC on July 10, 2006. The Phase I ESA, UST Closure Report and NYSDEC Spill Closure Letter are provided in Appendix 2.

The AOCs identified for this Site include:

1. Historical use of Site as a filling station, auto repair, and auto sales.

1.5 SUMMARY OF WORK PERFORMED UNDER THE REMEDIAL INVESTIGATION

Based on the December 2015 Remedial Investigation Work Plan submitted by Hydro Tech to OER, the following scope of work was performed at the Site prior to remedial activities:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Conducted a Ground Penetrating Radar (GPR) survey of the Site to identify subsurface structures (i.e. tanks, building foundations, utilities, etc.);

3. Installed six (6) soil borings across the entire project Site, and collected twelve (12) soil samples for chemical analysis from the soil borings to evaluate soil quality;
4. Installed three (3) groundwater monitoring wells throughout the Site to establish groundwater flow and collected three (3) groundwater samples for chemical analysis to evaluate groundwater quality;
5. Installed four (4) soil vapor probes throughout the Site and collected four (4) samples for chemical analysis; and
6. Collected one (1) outdoor ambient air sample for chemical analysis.

1.6 SUMMARY OF ENVIRONMENTAL FINDINGS

A remedial investigation was performed and is documented in the "Remedial Investigation Report, 1353 Flatbush Avenue, Brooklyn, New York", dated February 2016. The findings are summarized as follows:

1. No evidence of USTs was observed at the Site.
2. Elevation of the property ranges from 27.04 to 28.89 feet.
3. Depth to groundwater ranges from 24.20 to 24.81 feet below grade at the Site.
4. Groundwater flow is generally from northeast to southwest beneath the Site.
5. Bedrock was not encountered within 35 feet below grade at the Site.
6. The stratigraphy of the site, from the surface down, consists of 2 feet of brown silty sand, underlain by approximately 2 to 4 feet of light brown sandy clay, underlain by approximately 30 feet of tan coarse-grained sand.
7. Soil/fill samples results were compared to NYSDEC Unrestricted Use Soil Cleanup Objectives and Restricted Residential Soil Cleanup Objectives (SCOs) as presented in 6NYCRR Part 375-6.8 and CP51. Soil/fill samples collected during the RI showed no detectable concentration of PCBs. Three volatile organic compounds (VOCs) including

acetone (max. 0.11 milligrams per kilogram [mg/kg]), 1,2,4-trimethylbenzene (max. 4 mg/kg) and methyl ethyl ketone (max. 0.14 mg/kg) were detected in two deep soil samples at concentrations exceeding Unrestricted Use SCOs. Tetrachloroethylene was also detected at 0.026 mg/kg in one deep sample, but below Unrestricted Use SCOs. Several semi-volatile organic compounds (SVOCs) consisting of polycyclic aromatic hydrocarbon (PAH) compounds were detected in three shallow soil samples at concentrations exceeding Restricted Residential Use SCOs, including benz(a)anthracene (max. 110 mg/kg), benzo(a)pyrene (max. 99 mg/kg), benzo(b)fluoranthene (max. 100 mg/kg), benzo(k)fluoranthene (max. 73 mg/kg), chrysene (max. 120 mg/kg), dibenzo(a,h)anthracene (max. 16 mg/kg), fluoranthene (max. 270 mg/kg), indeno(1,2,3-cd)pyrene (max. 65 mg/kg), phenanthrene (max. 190 mg/kg) and pyrene (max. 220 mg/kg). One SVOC, dibenzofuran (max. 11 mg/kg), was detected in two shallow samples at a concentration exceeding Unrestricted Use SCO. The pesticide, 4,4'-DDT (max. 0.011 mg/kg), was detected in two shallow samples and two deep samples at concentrations exceeding Unrestricted Use SCO. Several metals including arsenic (max. 18.6 mg/kg), barium (max. 451 mg/kg), cadmium (max. 3.71 mg/kg), copper (max. 1,380 mg/kg), lead (max. 2,660 mg/kg) and mercury (max. 1.21 mg/kg) were detected in three shallow soil samples at concentrations exceeding Restricted Residential Use SCOs. Nickel (max. 42.9 mg/kg) and zinc (max. 541 mg/kg) were also detected at concentrations exceeding Unrestricted Use SCOs.

8. Groundwater samples results were compared to New York State 6NYCRR Part 703.5 Class GA groundwater quality standards (GQS). Groundwater samples collected during the investigations showed no PCBs or pesticides in any sample. Three VOCs were detected above GQS including isopropylbenzene (25 µg/L) and n-propylbenzene (39 µg/L) in MW-2, and chloroform (max. 11 µg/L) in MW-3. Four SVOCs were detected above GQS in MW-3, including benz(a)anthracene (0.03 µg/L), benzo(b)fluoranthrene (0.02 µg/L), benzo(k)fluoranthrene (0.02 µg/L) and chrysene (0.02 µg/L). Several dissolved metals were identified in groundwater but only manganese (max. 1.1 µg/L) and sodium (max. 143 µg/L) exceeded their respective GQS.

9. Soil vapor results collected during the RI were compared to compounds listed in Table 3.1 Air Guideline Values Derived by the NYSDOH located in the New York State Department of Health Final Guidance for Evaluating Soil Vapor Intrusion dated October 2006. Soil vapor results collected during the RI showed relatively low-levels of petroleum related VOCs. Total concentrations of petroleum-related VOCs (BTEX) ranged from 12.83 $\mu g/m^3$ to 38.79 $\mu g/m^3$. Toluene was the highest detected petroleum-related compound with a concentration of 17.2 $\mu g/m^3$ in SV-3. Chlorinated VOCs were also detected with tetrachloroethylene (PCE) detected at a maximum of 6.05 $\mu g/m^3$, 1,1,1-trichloroethane (TCA) detected at 0.383 $\mu g/m^3$ and trichloroethylene (TCE) detected at a maximum of 0.081 $\mu g/m^3$. Concentrations for PCE, TCE and carbon tetrachloride were below the monitoring level ranges established within the State DOH soil vapor guidance matrix.

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.

2.0 REMEDIAL ACTION OBJECTIVES

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

Soil

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

Groundwater

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

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 below 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

As required, a Track 1 Unrestricted Use scenario is evaluated for the remedial action. The following is a detailed description of the alternatives analyzed to address impacted media at the Site:

Alternative 1:

- 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 Unrestricted Use SCOs is still present at the base of the excavation, additional excavation would be performed to ensure complete removal of soil/ fill that does not meet Track 1 Unrestricted Use SCOs.
- No Engineering or Institutional Controls are required for a Track 1 cleanup. However, as part of development, a minimum 20-mil vapor barrier would be installed beneath the building foundation to prevent potential exposures from soil vapor in the future.
- As part of the development, a composite cover would be placed over the entire Site.

Alternative 2:

- Establishment of Site Specific Track 4 Site-Specific 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 end point sampling. Based on the results of the Remedial Investigation, it is expected that this alternative would be achieved by excavating the building footprint to 7.5 to 14.5 feet below grade and excavating the landscaped/capped areas to a depth of 2 feet below grade for developmental purposes. If soil/fill containing analytes at concentrations above Track 4 Site-Specific SCOs is still present at the base of the excavations after removal of all soil required for the development construction is complete, additional excavation will be performed to meet Track 4 Site-Specific SCOs.
- Placement of a composite cover system over the entire Site to prevent exposure to remaining soil/fill;
- Installation of a minimum 20-mil vapor barrier system beneath the entire building slab and along foundation side walls to street grade in the partial basement area of the building to prevent future potential exposures from 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 periodic inspections and certification that the controls are performing as they were intended. The SMP will note that the property owner and property owner's successors and assigns must comply with the approved SMP; and
- The property will continue to be registered with an E-Designation at the NYC Buildings Department.

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 all soil/fill exceeding Track 1 Unrestricted Use SCO's and groundwater protection standards, thus eliminating potential for direct contact with contaminated soil/fill once construction is complete and eliminating the risk of contaminants leaching into groundwater.

Alternative 2 would achieve comparable protections of human health and the environment by excavation and removal of most of the historic fill at the Site and by ensuring that remaining soil/fill on-Site meets Track 4 Site-Specific SCO's, as well as by placement of Institutional and Engineering Controls, including a composite cover system and vapor barrier. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. The vapor barrier would prevent any vapor from entering the building. Implementing Institutional Controls including a Site Management Plan and continuing the E-designation on the property would

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ensure that the composite cover system remains intact and protective of public health. Establishment of Track 4 Site-Specific SCO's would minimize the risk of contamination leaching into groundwater.

For both Alternatives, potential exposure to contaminated soils or groundwater during construction would be minimized by implementing a Construction Health and Safety Plan, an approved 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 below the building slab and outside foundations walls below grade.

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 SCO's and Protection of Groundwater SCO's. Compliance with SCGs for soil vapor would also be achieved by installing a vapor barrier system below the new building's slab and continuing the vapor barrier along subgrade foundation walls as part of development.

Alternative 2 would achieve compliance with the remedial goals, chemical-specific SCG's and RAOs for soil through hot spot and Site-wide removal of soil to meet Track 4 Site-Specific SCO's. Compliance with SCG's for soil vapor would also be achieved by installing a vapor barrier system below the new building's slab and along subgrade 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) will be implemented during Site redevelopment under this RAWP. For both

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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 implementation phase until remedial action objectives are met. Under this criterion, alternatives are evaluated with respect to their short term effects during the remedial action on public health and the environment during implementation of the remedial action, including protection of the community, protection of onsite workers and environmental impacts.

Both Alternative 1 and 2 have similar short-term effectiveness during their implementation, 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 would be higher for Alternative 1 since excavation of greater amounts of historical fill material would take place. However, focused attention to means and methods during a Track 1 removal action, including community air monitoring and appropriate truck routing, would minimize 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 210 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 flag persons will be used to protect pedestrians at Site entrances and exits.

The potential adverse impact to the community, workers and the environment for both alternatives would be minimized through implementation of 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

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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 provide protection from on-Site contaminants by using personal protective equipment would be worn consistent with the documented risks within the respective work zones.

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 Engineering Controls/Institutional Controls (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 ECs.

Alternative 1 would achieve long-term effectiveness and permanence related to on-Site contamination by permanently removing all impacted soil/fill above Track 1 Unrestricted Use SCO's. Removal of on-Site contaminant sources will also prevent future groundwater contamination.

Alternative 2 would provide long-term effectiveness by removing most on-Site contamination and attaining Track 4 Site-Specific SCOs; installing a composite cover system across the Site; maintaining use restrictions; establishing an SMP to ensure long-term management of ICs and ECs; and maintaining registration as an E-designated 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 continue to provide the required level of protection.

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

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respect to a remedy for contaminated soil, which will eliminate any migration to groundwater. Potential sources of soil vapor and groundwater contamination will also be eliminated as part of the remedy.

REDUCTION OF TOXICITY, MOBILITY, OR VOLUME OF CONTAMINATED MATERIAL

This evaluation criterion assesses the remedial alternative's use of remedial technologies that permanently and significantly reduce toxicity, mobility, or volume of contaminants as their principal element. The following is the hierarchy of source removal and control measures that are to be used to remediate a Site, ranked from most preferable to least preferable: removal and/or treatment, containment, elimination of exposure and treatment of source at the point of exposure. It is preferred to use treatment or removal to eliminate contaminants at a Site, reduce the total mass of toxic contaminants, cause irreversible reduction in contaminants mobility, or reduce of total volume of contaminated media.

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

Alternative 2 would remove most of the historic fill at the Site, and all remaining on-Site soil/fill will meet Track 4 Site-Specific SCO's.

Alternative 1 would remove a greater total mass of contaminants from the Site. The removal of soil from 2 to 14.5 feet for the new development in both scenarios would lessen the difference in contaminant mass removal 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,

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administrative feasibility (e.g. obtaining permits for remedial activities), and availability of services and materials.

The techniques, materials and equipment to implement both Alternatives 1 and 2 are readily available and have been proven to be effective in remediating the contaminants present on the Site. They use standard equipment and technologies that are well established in the industry. 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.

Historic fill was not encountered during the RI, and the new building requires excavation of 62% of the Site to a depth of 14.5 feet. The costs associated with Alternative 1 would be higher than Alternative 2 if soil with analytes above Track 1 Unrestricted Use SCOs is encountered below the excavation depth required for development. Additional costs would include installation of additional shoring/underpinning, disposal of additional soil, and import of clean soil for backfill. However, long-term costs for Alternative 2 are likely higher than Alternative 1 based on implementation of a Site Management Plan as part of Alternative 2.

The remedial plan would couple the remedial action with the redevelopment of the Site, lowering total costs. The remedial plan will also consider the selection of the most appropriate disposal facilities to reduce transportation and disposal costs during cleanup and 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.

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This RAWP will be subject to a public review under the NYC VCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedy. This public comment will be considered by OER prior to approval of this plan. The Citizen Participation Plan for the project is provided in Appendix 3. Observations here will be supplemented by public comment received on the RAWP. Under both alternatives, the overall goals of the remedial program, to protect public health and the environment and eliminate potential contaminant exposures, have been broadly supported by citizens in NYC communities.

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 current, intended, and reasonably anticipated future land use of the Site and its surroundings are compatible with the selected remedy of soil remediation. The proposed future use of the Site includes a 7-story mixed-use structure with a cellar to provide one (1) commercial unit and 35 dwelling units. Following remediation, the Site will meet either Track 1 Unrestricted Use or Track 4 Site-Specific SCOs, both of which are protective of public health and the environment for its planned residential use. The proposed use is compliant with the property's zoning and is consistent with recent development patterns. The areas surrounding the site is urban and consists of predominantly mixed residential and commercial buildings in zoning districts designated for commercial, light manufacturing, and residential uses. The development

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would remediate a contaminated automobile repair lot and provide a modern mixed-use building. The proposed development would clean up the property and make it safer, create new employment opportunities, living space and associated societal benefits to the community, and other economic benefits from land revitalization.

Temporary short-term project impacts are being mitigated through site management controls and truck traffic controls during remediation activities. Following remediation, the Site will meet either Track 1 Unrestricted Use SCOs or Track 4 Site-Specific SCOs, both of which are protective of public health and the environmental for its planned use.

The Site is not in close proximity to important cultural resources, including federal or state historic or heritage sites or Native American religious sites, natural resources, waterways, wildlife refuges, wetlands, or critical habitats of endangered or threatened species. The Site is located in an urban area and not in proximity to fish or wildlife and neither alternative would result in any potential exposure pathways of contaminant migration affecting fish or wildlife. The remedial action is also protective of groundwater natural resources. The Site does not lie in a Federal Emergency Management Agency (FEMA)-designated flood plain. Both alternatives are equally protective of natural resources and cultural resources. Improvements in the current environmental condition of the property achieved by both alternatives considered in this plan are consistent with the City's goals for cleanup of contaminated land.

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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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. The remedial plan for either alternative 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. The New York City Clean Soil Bank program is available for reuse of any clean native soils under either alternative. A complete list of green remedial activities considered as part of the NYC VCP is included in a Sustainability Statement.

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4.0 REMEDIAL ACTION

4.1 SUMMARY OF REMEDIAL ACTION

The preferred remedial action alternative is Alternative 1, the Track 1 remedial action. The preferred remedial action achieves protection of public health and the environment for the intended use of the property. The preferred remedial action will achieve all of the remedial action objectives established for the project and addresses applicable SCGs. The preferred remedial action 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 the Citizen Participation Plan.
2. Perform a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Selection of Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility(s).
6. Excavation and removal of soil/fill exceeding Track 1 Unrestricted Use SCOs. For development purposes, the building footprint will be excavated to a maximum depth of 14.5 feet for the new building's cellar with 2 feet of soil excavated from the rear landscaped/capped areas. An additional hot spot will be excavated to approximately 6

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feet below grade in the vicinity of RI soil sample SP-6. Approximately 5,255 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 in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials.
9. Removal of all underground storage tanks that are encountered during soil/fill removal actions. Registration of tanks and reporting of any petroleum spills associated with UST's and appropriate closure of these petroleum spills 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 six (6) end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
12. Demarcation of residual soil/fill in landscaped areas.
13. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
15. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.

16. 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.

If Track 1 Unrestricted Use SCOs are not achieved, the following construction elements implemented as part of new development will constitute Engineering and Institutional Controls:

17. As part of development, installation of a vapor barrier system consisting of vapor barrier beneath the building slab and outside of sub-grade foundation sidewalls to mitigate soil vapor migration into the building. The vapor barrier system will consist of a minimum 20-mil vapor barrier below the slab throughout the full building area and a minimum 20-mil vapor barrier outside all sub-grade foundation sidewalls. All welds, seams and penetrations will be properly sealed to prevent preferential pathways for vapor migration.

18. As part of development, construction and maintenance of an engineered composite cover consisting of the 2.5-foot thick concrete building slab, 4-inch concrete paved walkways and a minimum of 2-feet of clean soil in all open space and landscaped areas to prevent human exposure to residual soil/fill remaining under the Site.

19. If Track 1 SCOs are not achieved, submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.

20. If Track 1 SCOs are not achieved, the property will continue to be registered with an E-Designation at 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.

SELECTION OF THE PREFERRED REMEDY

The preferred remedy for the site is Alternative 1, Track 1 Unrestricted Use SCOs. The Track 1 remedy will remove all soil/fill exceeding Unrestricted Use SCOs throughout the Site, which will be confirmed with post-excavation sampling. No Engineering Controls are required for a Track 1 cleanup. A composite cover consisting of the building concrete slab, 2 feet of clean soil, and concrete paved walkways covering the entire site and a vapor barrier would be installed as part of standard building development and are not considered part of the remedy.

4.2 SOIL CLEANUP OBJECTIVES AND SOIL/FILL MANAGEMENT

Track 1 Soil Cleanup Objectives (SCOs) are proposed for this project. The SCOs for this Site are defined in 6 NYCRR Part 375, Table 6.8(a) Track 1 Unrestricted Use. If Track 1 Unrestricted Use SCOs are not achieved, the 6 NYCRR Part 375 Table 6.8 (b) (Restricted Residential Use) SCOs will be used as amended by the following Site-Specific SCOs:

Contaminant	Track 4 SCOs
Total SVOCs	100 ppm
Lead	1,000 ppm
Barium	650 ppm
Arsenic	23 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 Appendix 4.

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

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Soil/Fill Excavation and Removal

The building footprint will be excavated approximately 14.5 feet bgs with some areas excavated to depths ranging from 7.5 feet to 10 feet bgs. In addition, the rear landscaped/capped areas with be excavated to 2 feet bgs with hot spot excavation, located around RI soil sample SP-6, to approximately 6 feet bgs. The location of planned excavations is shown in Figure 5. The total quantity of soil/fill expected to be excavated and disposed off-Site is 5,255 tons. For each disposal facility to be used in the remedial action, a letter from the developer/QEP to the receiving facility requesting approval for disposal and a letter back to the developer/QEP providing approval for disposal will be submitted to OER prior to any transport and disposal of soil at a facility.

Disposal facilities will be reported to OER when they are identified and prior to the start of remedial action.

End-Point Sampling

End-point samples will be analyzed for compounds and elements as described below utilizing the following methodology:

- 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.

New York State ELAP certified labs will be used for all end-point sample analyses. Labs performing 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.

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Confirmation End-Point Sampling

Removal actions for development purposes under this plan will be performed in conjunction with post-excavation confirmation end-point soil sampling. Confirmation samples and testing will be performed promptly following materials removal and completed prior to Site development activities. To evaluate attainment of Track 1 Unrestricted Use SCOs, six post-excavation confirmation soil samples will be collected from the base of the excavation at the proposed locations in Figure 4. For comparison to Track 1 Unrestricted Use SCOs, analytes will include VOCs, SVOCs, pesticides, PCBs and metals according to analytical methods described above.

Hotspot End-Point Sampling

End-point samples will be collected from the sidewalls and base of excavation at the one (1) hotspot location identified in the Remedial Investigation, according to the procedure listed below. The hotspot consists of former soil probe SP-1 for SVOCs. End-point samples will be analyzed for SCO trigger parameters.

For any hotspots identified during this remedial program, including any hotspots identified during the remedial action, hotspot removal actions will be performed to ensure that hotspots are fully removed and end-point samples will be collected at the following frequency:

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

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

Quality Assurance/Quality Control

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 laboratory will address the accuracy, precision and completeness requirements for all data generated.

Quality Assurance/Quality control sampling will consist of collecting blind field duplicates, field blanks, and matrix spike duplicates. Hydro Tech will perform a completeness check of the analytical data packages and review the QA/QC observations and deficiencies.

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.

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Samples will be preserved through the use of ice or "cold-packs" to maintain a temperature of 4°C.

Dedicated disposable sampling materials will be used for the collection of endpoint samples, eliminating the need to prepare field equipment (rinsate) blanks. However, if non-disposable equipment is used (stainless steel scoop, etc.), field rinsate blanks will be prepared at a rate of 1 for every eight samples collected. Decontamination of non-dedicated sampling equipment will consist of the follow:

- Gently tap or scrape to remove adhered soil,
- Rinse with tap water,
- Wash with Alconox detergent solution and scrub,
- Rinse with tap water, and
- Rinse with distilled or deionized water.

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

Import of Soils

Import of soils onto the property will be performed in conformance with the Soil/Materials Management Plan in Appendix 4. Imported soil will meet Unrestricted Use SCOs. The estimated quantity of soil to be imported into the Site for backfill and cover soil is 600 tons. A map of soil backfill placement locations is shown in Figure 6.

Reuse of Onsite Soils

Reuse of onsite soils already onsite will be performed in conformance with the Soil/Materials Management Plan in Appendix 4. Soil reuse is not planned on this project.

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4.3 ENGINEERING CONTROLS

The remedial action will achieve Track 1 Unrestricted Use SCOs and no Engineering Controls are required. However, the following design elements will be incorporated into the project as part of the development:

(1) Composite Cover System consisting of clean soil cover, concrete covered walkways, concrete building slabs and foundation; and
(2) Soil Vapor Barrier System beneath the building concrete foundation and outside the building vertical foundation walls

If Track 1 is not achieved, these construction elements will constitute Engineering Controls that will be employed in the remedial action to address residual contamination remaining at the Site.

Composite Cover System

Exposure to residual soil/fill will be prevented by an engineered, composite cover system to be built on the Site. This composite cover system will be comprised of a 2-feet and 6-inch thick concrete building slab underlain by 6 inches of clean sub-base material in building areas, 4-inch concrete paved walkways, and 2 feet of clean soil in open/landscaped areas. Figure 7 shows the location of each cover type built at the Site. Figure 8 shows the typical design for each remedial cover type used on this Site.

The composite cover system will be a permanent engineering control for the Site. The system will be inspected and reported at specified intervals as required by this RAWP and the Site Management Plan. A Soil and Materials 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.

- **Vapor Barrier**

Migration of soil vapor from onsite or offsite sources into the building in the future will be mitigated with a combination of the building slab and a vapor barrier system. A minimum 20-mil vapor barrier will be installed beneath the building slab and behind the foundation walls. The vapor barrier will be installed according to manufacturer instructions and all seams, penetrations and repairs will be sealed. Once the vapor barrier has been selected and the installation details have been finalized, the specifications will be provided to the OER.

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. 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 P.E. will certify that the two proposed materials, sourced from two separate companies, are compatible and will provide a protective mitigative engineering control that will prevent vapor intrusion of soil gas contaminants into the indoor space of the proposed building. The extent of the proposed vapor barrier membrane and installation details (penetrations, joints, etc.) with respect to the proposed building foundation, footings, slab, and sidewalls are provided in Figure 9.

The Vapor Barrier System is a permanent engineering control and will be inspected and its performance certified at specified intervals as required by this RAWP and the Site Management Plan. A Soil and Materials 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 vapor barrier system is disturbed after the remedial action is complete. Maintenance of these systems will be described in the Site Management Plan in the Remedial Action Report.

4.4 INSTITUTIONAL CONTROLS

A Track 1 remedial actions is proposed and Institutional Controls are not required. If Track 1 remedial action is not achieved, Institutional Controls (IC) will be incorporated in this remedial

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action to manage residual soil/fill and other media and render the Site protective of public health and the environment. These IC's define the program to operate, maintain, inspect and certify the performance of Engineering Controls and Institutional Controls on this property. Institutional Controls would be implemented in accordance with a Site Management Plan included in the final Remedial Action Report (RAR).

Institutional Controls would be:

- Continued registration of the E-Designation for the property. This RAWP includes a description of all ECs and ICs and summarizes the requirements of the SMP 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 monitoring and reporting of ECs. SMP will require that the property owner and property owner's successors and assigns will submit to OER a periodic written statement that certifies that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by OER; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. OER retains the right to enter the Site in order to evaluate the continued maintenance of any controls. This certification shall be submitted at a frequency to be determine by OER in the SMP and will comply with RCNY §43-1407(l)(3).
- Vegetable gardens and farming on the Site are prohibited in contact with residual soil materials;
- Use of groundwater underlying the Site is prohibited without treatment rendering it safe for its intended use;
- All future activities on the Site that will disturb residual material must be conducted pursuant to the soil management provisions in an approved SMP;

- The Site will be used for commercial/residential use and will not be used for a higher level of use without prior approval by OER.

4.5 SITE MANAGEMENT PLAN

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

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

Site management activities and EC/IC certification will be scheduled by OER on a periodic basis to be established in the SMP and will be subject to review and modification by OER. The Site Management Plan will be based on a calendar year and certification reports will be due for submission to OER by July 30 of the year following the reporting period.

4.6 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

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

Investigations reported in the Remedial Investigation Report (RIR) are sufficient to complete a Qualitative Human Health Exposure Assessment (QHHEA) for this project. As part of the VCP process, a QHHEA was performed to determine whether the Site poses an existing or future health hazard to the Site's exposed or potentially exposed population. The sampling data from the RI were evaluated to determine whether there is any health risk by characterizing the exposure setting, identifying exposure pathways, and evaluating contaminant fate and transport. This QHHEA was prepared in accordance with Appendix 3B and Section 3.3 (b) 8 of the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation.

KNOWN AND POTENTIAL CONTAMINANT SOURCES

Based on the results of the RIR, the contaminants of concern are:

Soil:

- VOCs including 1,2,4-trimethylbenzene, acetone, and methyl ethyl ketone were identified, but did not exceed Unrestricted Use SCOs;
- SVOCs including benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene and pyrene exceeding Restricted Residential Use SCOs;
- One pesticide, 4,4'-DDT was identified, but did not exceed Unrestricted Use SCO; and
- Metals including arsenic, barium, cadmium, copper, lead, mercury, nickel and zinc exceeding Unrestricted Use SCOs;

Groundwater:

- Three VOCs, chloroform, isopropylbenzene and n-propylbenzene exceeding their respective GQS;
- Four SVOCs, benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene, exceeding GQS; and
- Dissolved metals including manganese and sodium exceeding GQS.

Soil Vapor:

- Chlorinated VOCs, including TCA, PCE and TCE, were detected well below NYS DOH monitoring thresholds; and
- Low levels of petroleum-related VOCs including benzene, toluene, ethyl-benzene and xylenes

NATURE, EXTENT, FATE AND TRANSPORT OF CONTAMINANTS

The information compiled during the remedial investigation has confirmed the presence of shallow contaminated material. VOCs, SVOCs, pesticides and metals above Unrestricted Use SCOs were present in mostly the shallow 0-2 feet samples. Metals that were detected above Unrestricted Use SCOs in soils were generally found in low concentrations in dissolved groundwater samples. Soil vapor samples exhibited low levels of both petroleum-related compounds and chlorinated VOCs.

RECEPTOR POPULATIONS

On-Site Receptors: The site is currently a vacant lot. Access to the Site is restricted by chained and locked, perimeter fence and security guards. On-Site receptors are limited to trespassers, site representatives, and visitors granted access to the property. During construction, potential on-site receptors include construction workers, site representatives, and visitors. Under proposed future conditions, potential on-site receptors include adult and child building residents, workers and visitors.

Off-Site Receptors: Potential off-site receptors within a 500 foot radius of the Site include adult and child residents; commercial and construction workers; pedestrians; and trespassers based on the following land uses within 500 feet of the Site:

1. Commercial Businesses – existing and future
2. Building Construction/ Renovation – existing and future
3. Pedestrians, Trespassers, Cyclists – existing and future
4. Schools and Daycare Facilities – existing and future

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POTENTIAL ROUTES OF EXPOSURE

Three potential primary routes exist by which chemicals can enter the body: ingestion, inhalation, and dermal absorption. Exposure can occur based on the following potential media:

- Ingestion of groundwater or fill/ soil;
- Inhalation of vapors or particulates; and
- Dermal absorption of groundwater or fill/ soil.

POTENTIAL EXPOSURE POINTS

Current Conditions: The site is currently a vacant lot. Exposure to historic fill is not possible and there are no potential exposure pathways from ingestion, inhalation, or dermal absorption of soil/ fill as the site is fully capped. Groundwater is not exposed at the Site. The Site was served by the public water supply and groundwater is not used at the Site for potable supply and there is no potential for exposure. Based upon data collected from the RI, soil vapor is accumulating beneath the Site.

Construction/ Remediation Conditions: During the remedial action, onsite 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 exposed impacted soil and fill. Similarly, off-Site receptors could be exposed to dust and vapors from on-Site activities. Due to the depth of groundwater, direct contact with groundwater is not expected. During construction, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through the Soil/Materials Management Plan, dust controls, and through the implementation of the Community Air-Monitoring Program and a Construction Health and Safety Plan.

Proposed Future Conditions: Under future remediated conditions, all soils in excess of Track 1 SCOs will be removed and the site will be fully; there will be no potential of direct exposure to soil and groundwater remaining in place. In addition, the vapor barrier will prevent any potential soil vapors from entering the building. The site is served by the public water supply, and

groundwater is not used at the site. There are no plausible off-site pathways for oral, inhalation, or dermal exposure to contaminants derived from the site.

OVERALL HUMAN HEALTH EXPOSURE ASSESSMENT

There are no potential complete exposure pathways for the current site condition. There are potential complete exposure pathways that require mitigation during implementation of the remedy. There are no complete exposure pathways under future conditions after the site is developed. This assessment takes into consideration the reasonably anticipated use of the site, which includes a 7-story mixed-use commercial/retail building with a basement level, a site-wide surface cover, and a subsurface vapor barrier system for the building. Under current conditions, on-Site exposure pathways exist for those with access to the Site 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. 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.

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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 A.J. Infante (Project Manager) and Rachel Ataman (Senior Vice President). The Professional Engineer (PE) for this project is Tarek Z. Khouri and the Qualified Environmental Professional (QEP) is Mark E. Robbins.

5.2 SITE SECURITY

Site access will be controlled by barriers that will be installed around work areas as needed to delineate and restrict access to the work area. For work areas of limited size, barrier tape will be sufficient to delineate and restrict access. For larger worker areas, temporary fencing will be provided.

5.3 WORK HOURS

The hours for operation of remedial construction will be from 7:00am to 5:00pm. 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 5. The Site Safety Coordinator will be Carlos Quinonez. 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.

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

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

An emergency contact sheet with names and phone numbers is included in the CHASP. 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

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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.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis during invasive work. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

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

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

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

Particulate Monitoring, Response Levels, and Actions

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

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/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.

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5.6 AGENCY APPROVALS

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

5.7 SITE PREPARATION

Pre-Construction Meeting

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

Mobilization

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

Utility Marker Layouts, Easement Layouts

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

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utilities will be prevented by maintaining a safe distance between overhead power lines and drill rig masts.

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

EQUIPMENT AND MATERIAL STAGING

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

DEWATERING

Due to the depth of groundwater, dewatering is not anticipated during remediation and construction. In the event that dewatering of groundwater or surface water 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 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.

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.

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Truck Inspection Station

An outbound-truck inspection station will be set up close to the Site exit. Before exiting the 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, Hello Living / Hello Flatbush, LLC will undertake the following steps for site preparedness prior to the event and response after the event.

Storm Preparedness

Preparations in advance of an extreme storm event will include the following: containerized hazardous materials and fuels will be removed from the property; 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.

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

5.8 TRAFFIC CONTROL

Drivers of trucks leaving the Site with soil/fill will be instructed to proceed without stopping in the vicinity of the site to prevent neighborhood impacts. The planned route on local roads for trucks leaving the site will be provided to the OER once the soil disposal facilities have been determined.

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 and the disposal locations of exported materials;
- Status of on-Site soil/fill stockpiles;
- A summary of all citizen complaints, with relevant details (basis of complaint; actions taken; etc.);
- A summary of CAMP excursions, if any;

- Photograph of notable Site conditions and activities.

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

Record Keeping and Photo-Documentation

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

5.11 COMPLAINT MANAGEMENT

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

5.12 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

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

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

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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;
- Manifests for al soil or fill disposal;
- Photographic documentation of remedial work performed under this remedy;
- Site Management Plan (if Track 1 is not achieved);
- Text description with thorough detail of all engineering and institutional controls (if Track 1 is not achieved);
- Description of any changes in the remedial action from the elements provided in this RAWP and associated design documents;
- Tabular summary of all end point sampling results (including all soil test results from the remedial investigation for soil that will remain on site) and all soil/fill waste characterization results, QA/QC results for end-point sampling, and other sampling and chemical analysis performed as part of the remedial action;
- Test results or other evidence demonstrating that remedial systems are functioning properly;
- Account of the source area locations and characteristics of all soil/fill material removed from the Site including a map showing the location of these excavations and hotspots, tanks or other contaminant source areas;

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- Full accounting 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 (if Track 1 is not achieved);
- The RAWP and Remedial Investigation Report will be included as appendices to the RAR; and
- Reports and supporting material will be submitted in digital form and final PDF's will include bookmarks for each appendix.

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Remedial Action Report Certification

I, Tarek Z. Khouri, am currently a registered professional engineer licensed by the State of New York. I performed professional engineering services and had primary direct responsibility for implementation of the remedial program for the 1353 Flatbush Avenue site, site number 16EHAZ157K, VCP Number 16CVCP070K. I certify to the following:

- I have reviewed this document, to which my signature and seal are affixed.
- Engineering Controls implemented during this remedial action were designed by me or a person under my direct supervision and achieve the goals established in the Remedial Action Work Plan for this site.
- The Engineering Controls constructed during this remedial action were professionally observed by me or by a person under my direct supervision and (1) are consistent with the Engineering Control design established in the Remedial action Work Plan and (2) are accurately reflected in the text and drawings for as-built design reported in this Remedial Action Report.
- The OER-approved Remedial Action Work Plan dated [date] and Stipulations in a letter dated [date] 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.

Name

PE License Number

Signature

Date

PE Stamp

I, Mark E. Robbins, am a Qualified Environmental Professional. I had primary direct responsibility for implementation of the remedial program for the 1353 Flatbush Avenue site, site number 16EHAZ157K, 16CVCP070K. I certify to the following:

- The OER-approved Remedial Action Work Plan dated [date] and Stipulations in a letter dated [date] 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.

QEP Name

QEP Signature

Date

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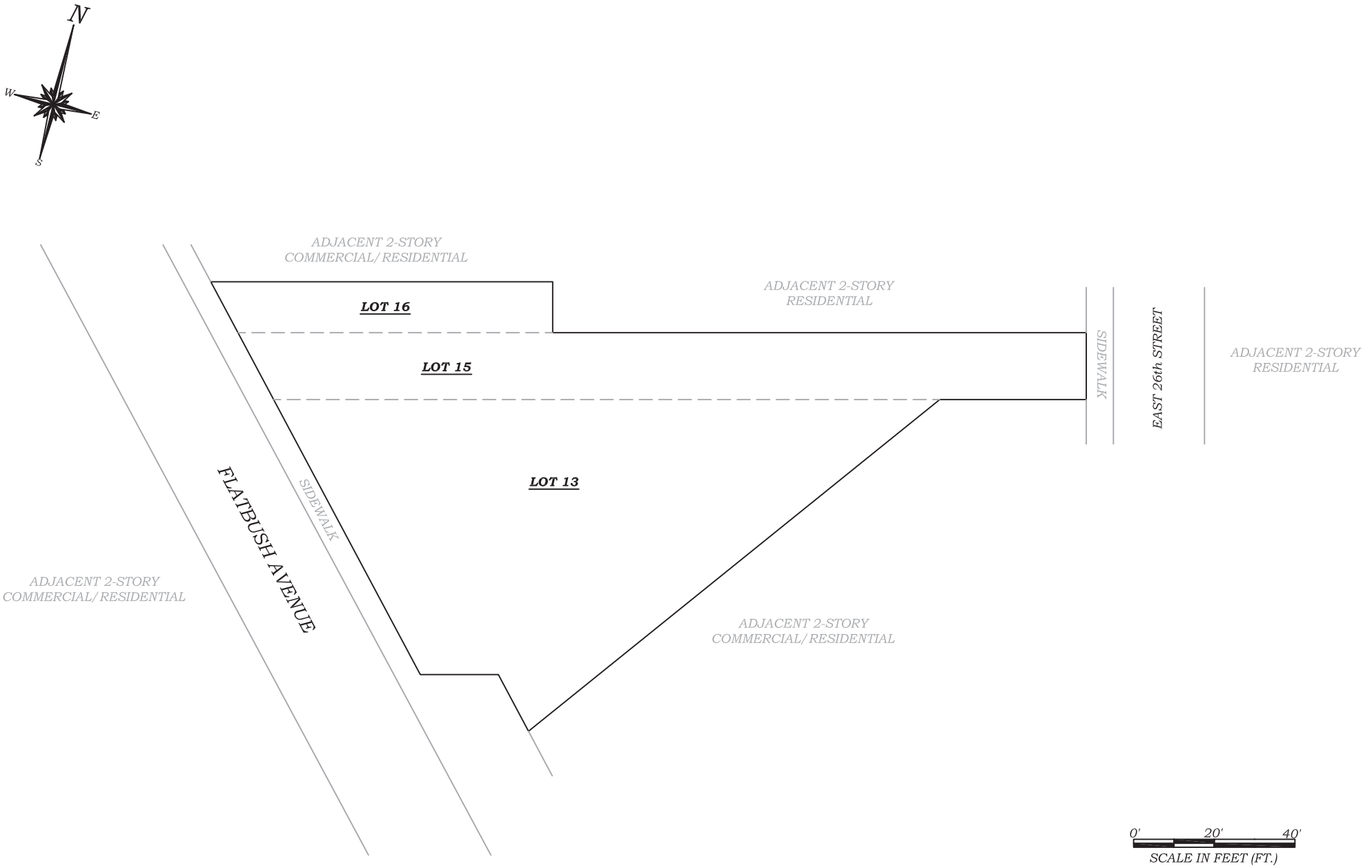
7.0 SCHEDULE

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, an 8-month remediation period is anticipated. The proposed start time for this remediation is summer 2016.

Schedule Milestone	Weeks from Remedial Action Start	Duration (weeks)
OER Approval of RAWP	0	-
Fact Sheet 2 announcing start of remedy	0	-
Mobilization	4	1
Remedial Excavation	5	16
Demobilization	32	1
Submit Remedial Action Report	36	4



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Brooklyn, NY
HTE Job # 150298

Drawn By: C.Q.
Reviewed By: C.Q.
Approved By: M.R
Date: 11/24/15
Scale: AS NOTED

TITLE:

FIGURE 1: SITE BOUNDARY MAP

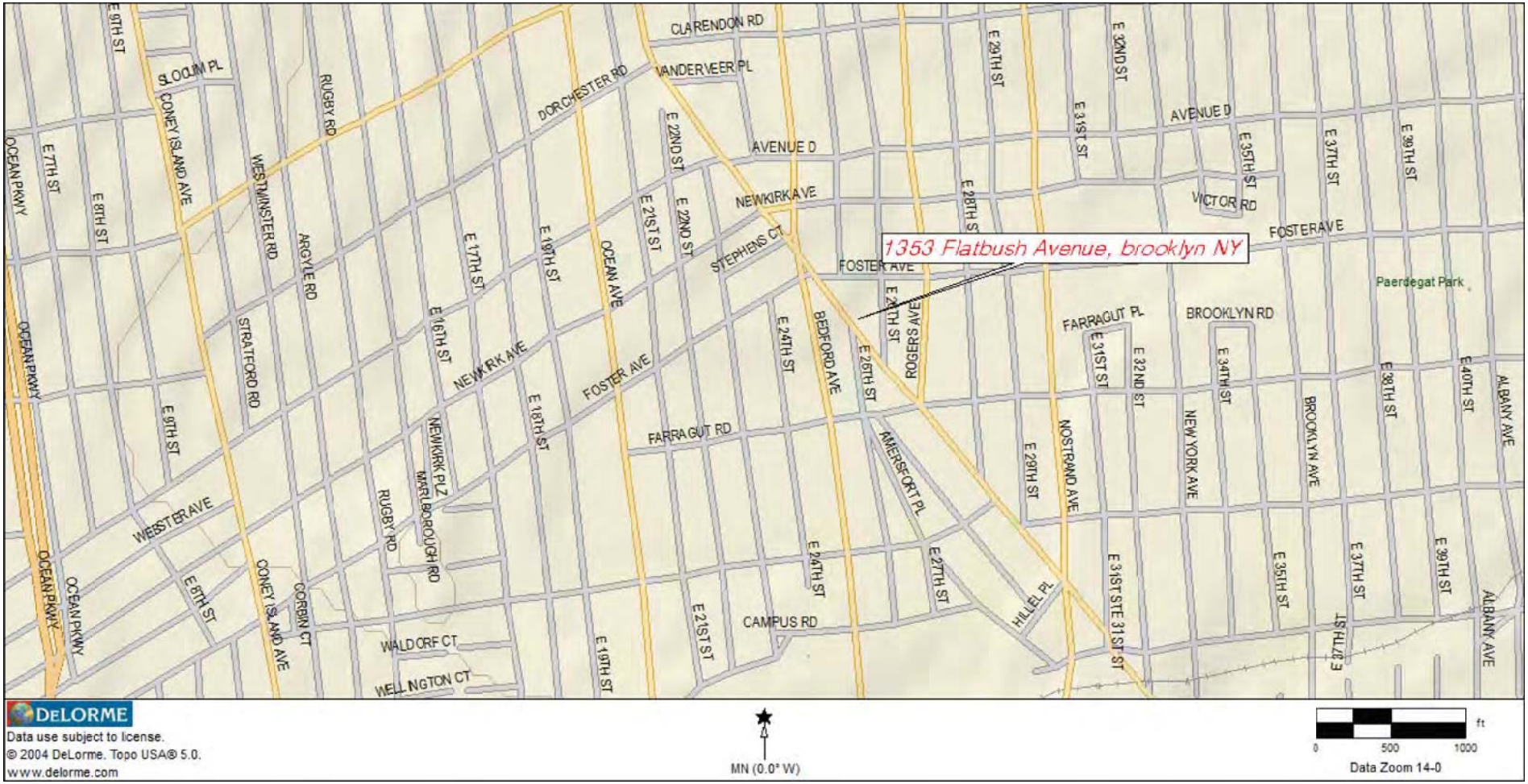

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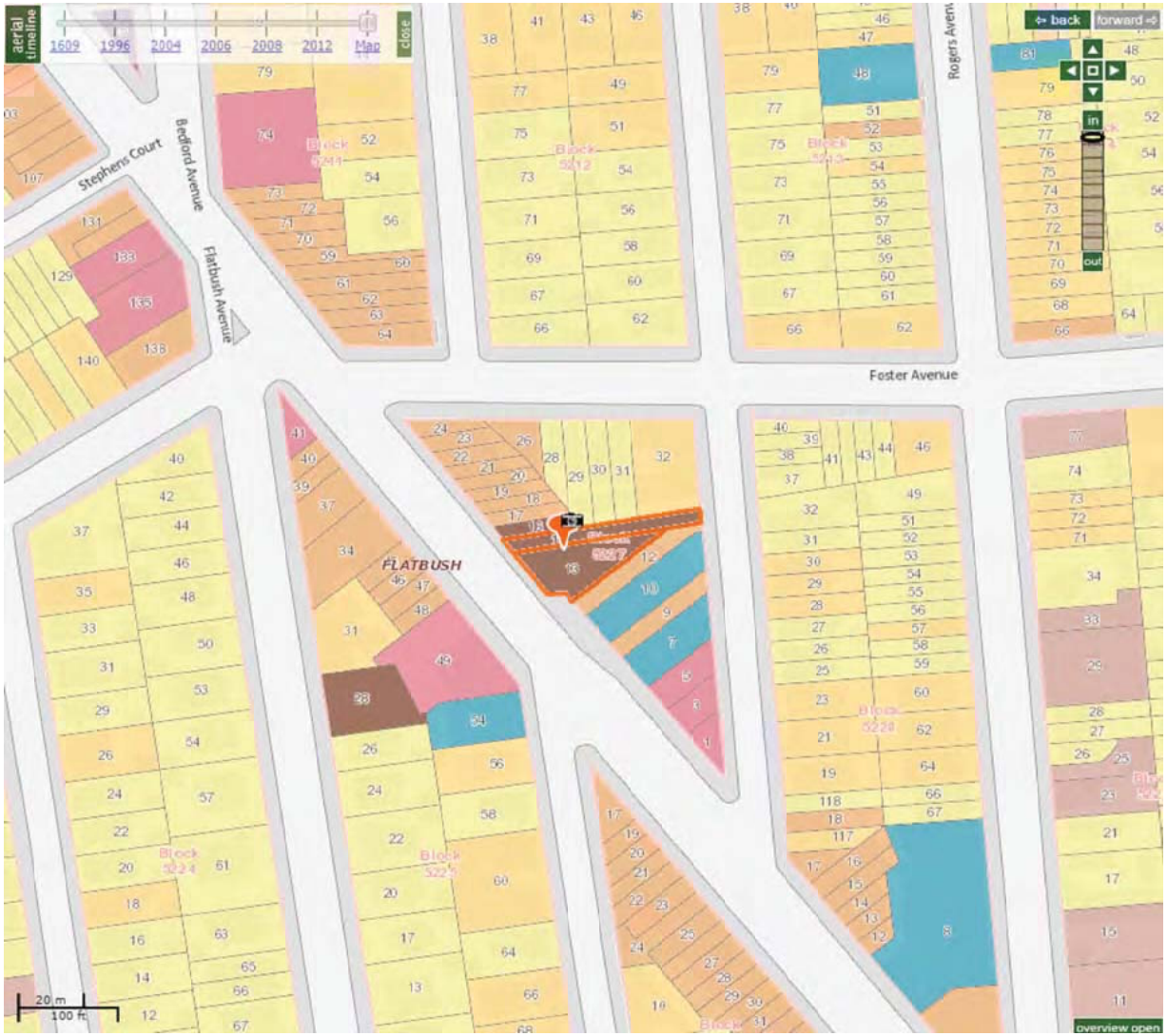
FIGURE 2: SITE LOCATION MAP



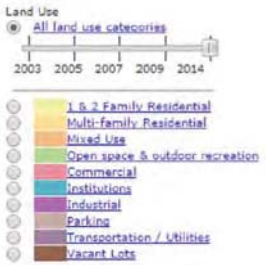


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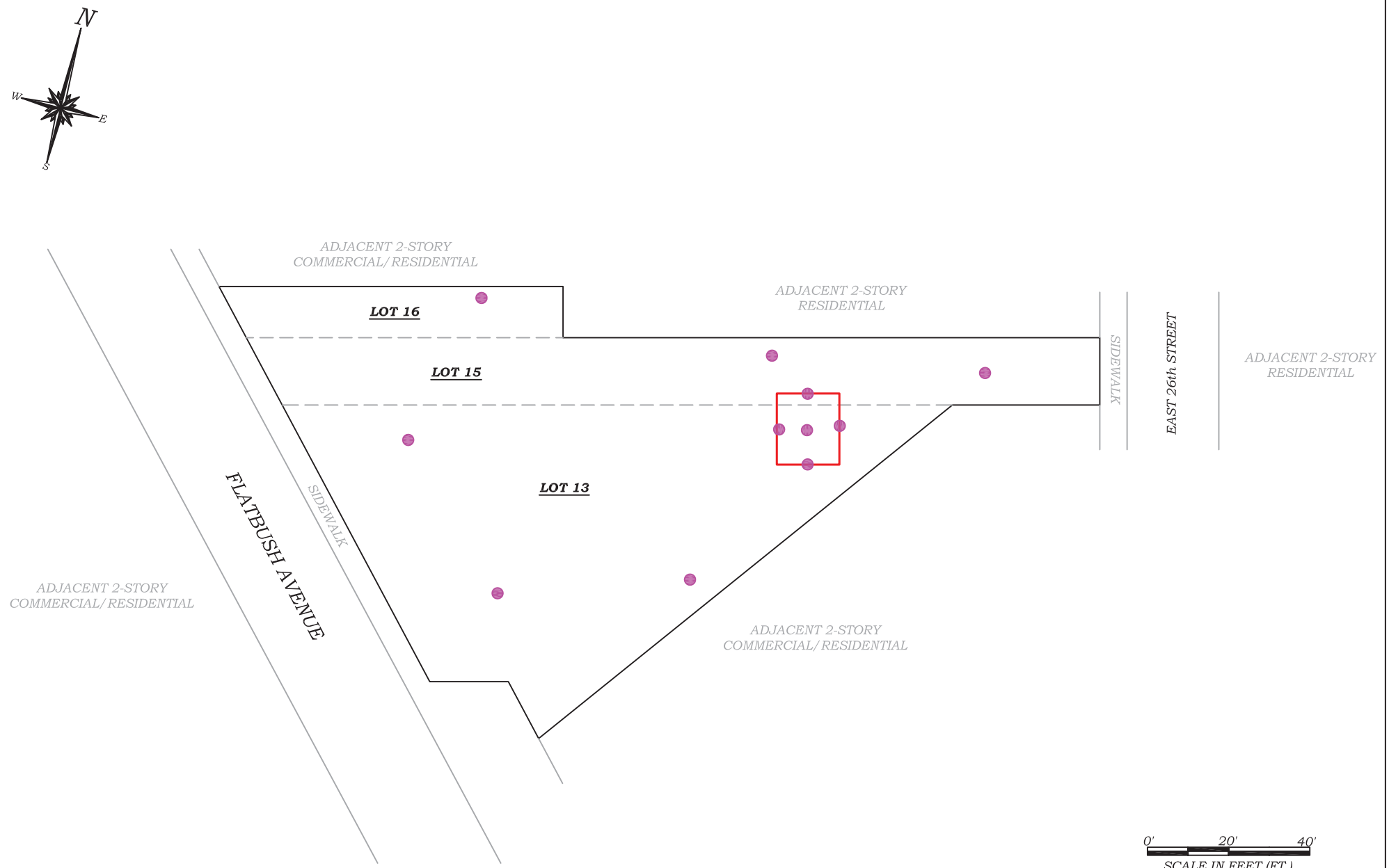
FIGURE 3: SURROUNDING LAND USAGE



LEGEND:

END POINT SAMPLING LOCATIONS

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FIGURE 4: MAP OF END POINT SAMPLE LOCATIONS

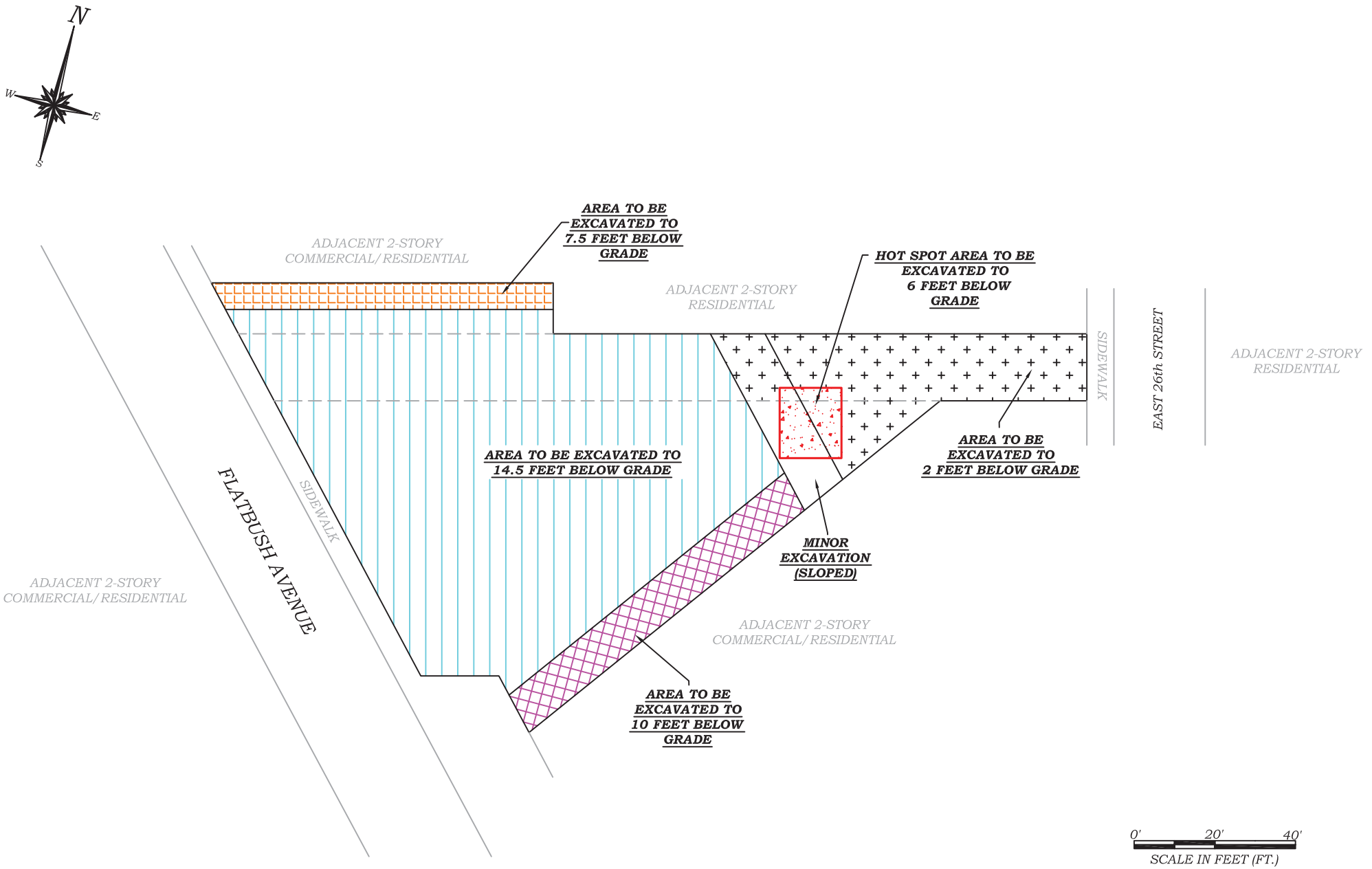

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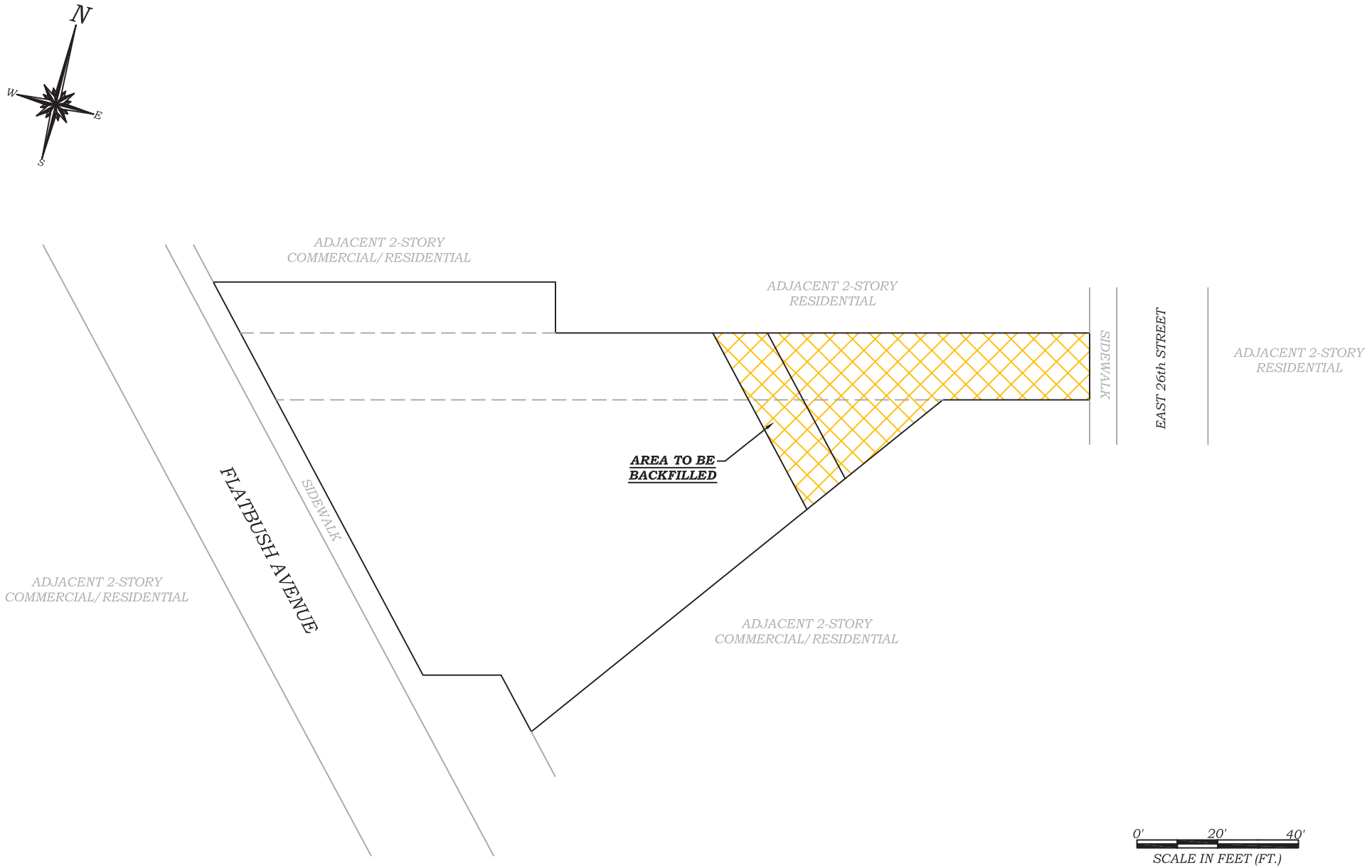
FIGURE 5: SITE EXCAVATION DIAGRAM



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Reviewed By:
Approved By: M.R
Date: 11/24/15
Scale: AS NOTED

TITLE:

FIGURE 6: MAP OF SOIL / FILL REUSE AND BACKFILL PLACEMENT LOCATIONS

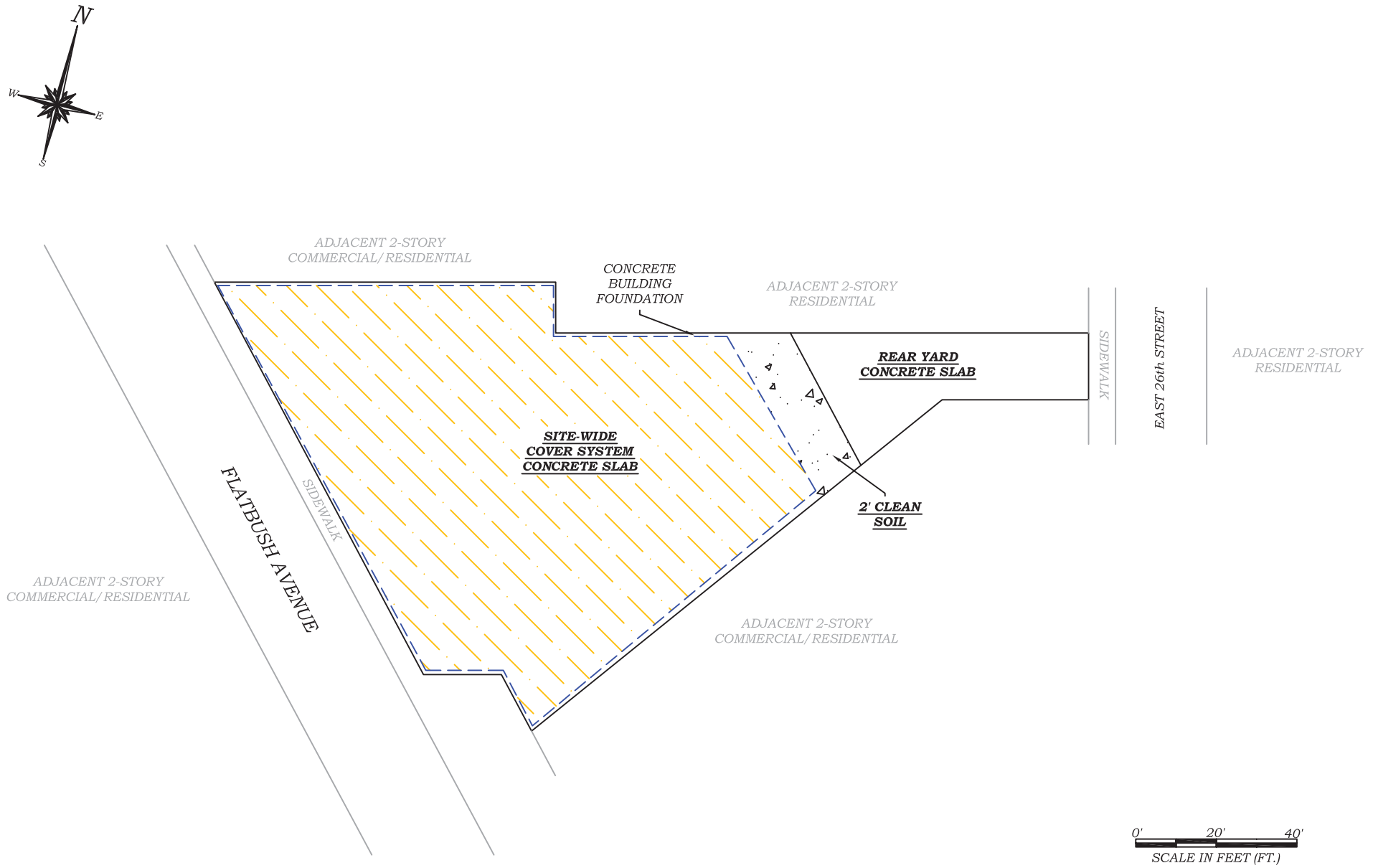

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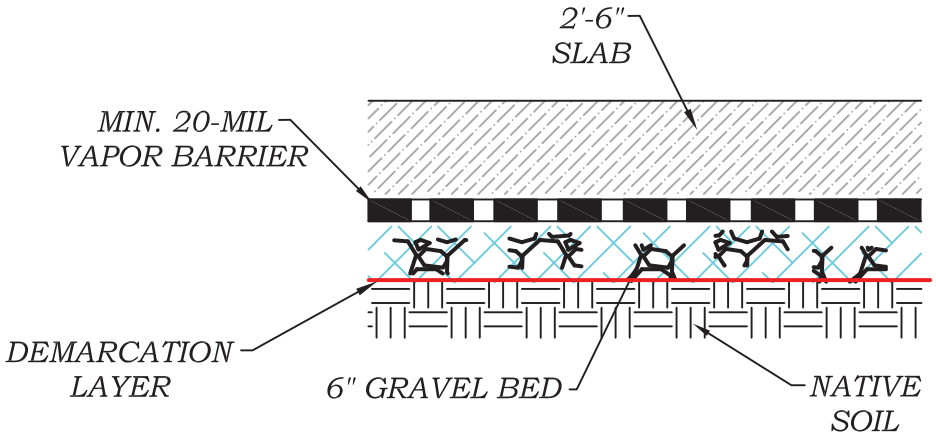
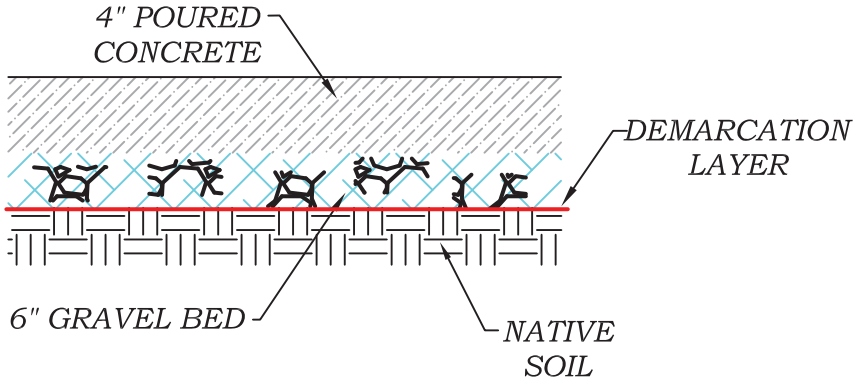
FIGURE 7 – COMPOSITE COVER DIAGRAM

UNDERSLAB SECTION DETAILS





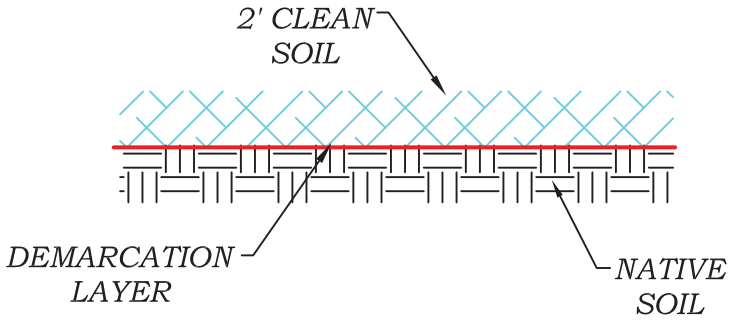


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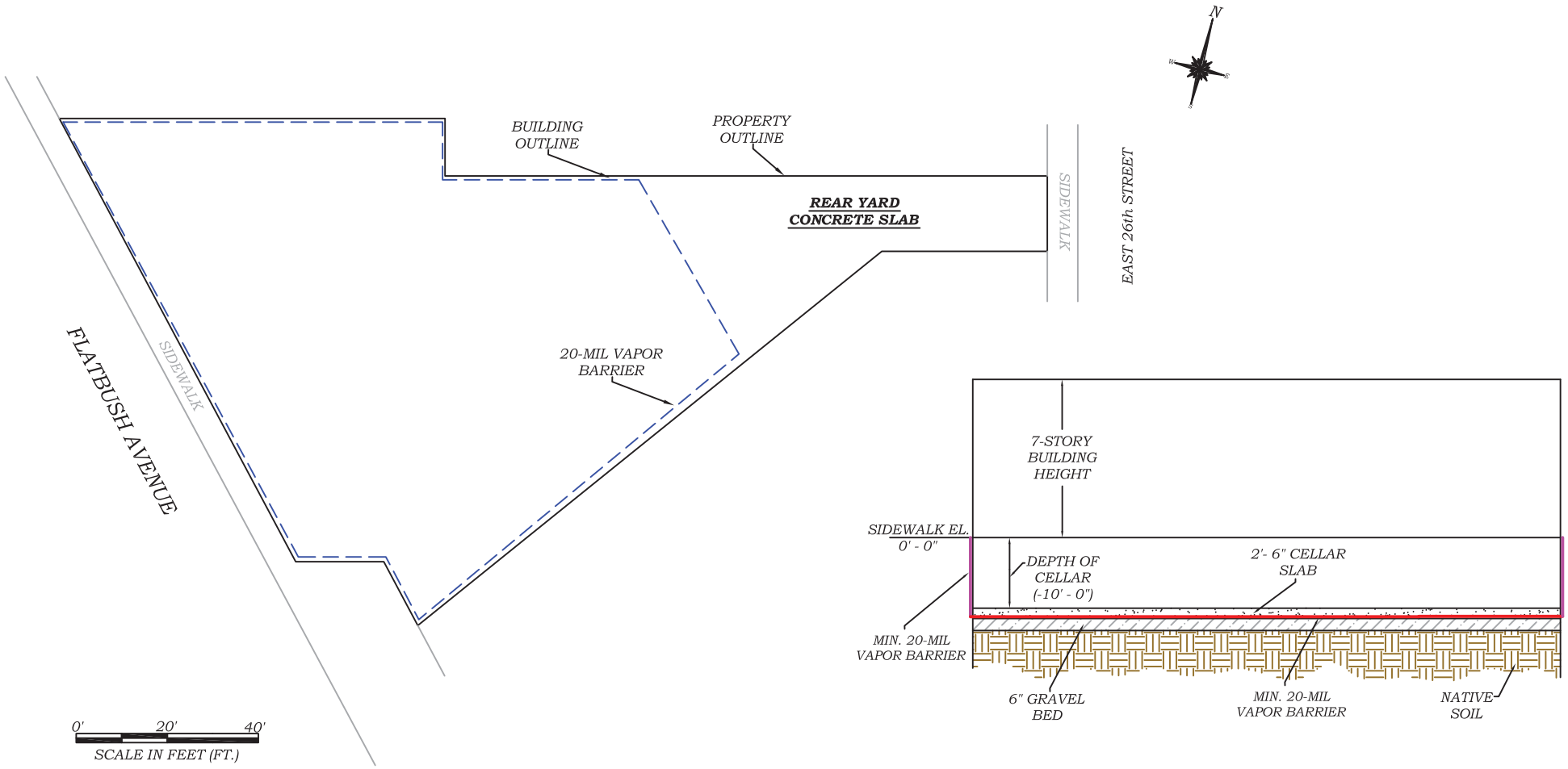
FIGURE 8: COVER SYSTEM DETAIL



ELEVATION VIEW

NOTES:

1. ALL ELEVATIONS ARE RELATIVE TO EXISTING GRADE, WHICH IS ARBITRARILY ASSMED TO BE AT 0' - 0" EL.
2. THE VAPOR BARRIER DESIGN IS INDEPENDENT OF THE ACTUAL TYPE OF FOUNDATION CONSTRUCTED AT THE SITE. ANY OBJECTS THAT BISECT THE LINER SUCH AS PIERS OF PILES MUST BE CUT THROUGH THE LINER AND CONTACT BETWEEN THE BARRIER AND THE OBJCET MUST BE SEALED AS PER THE MANUDACTURER'S RECOMMENDATION.
3. BUILDINGHEIGHT AND THE SHAPE OF THE ROOF ARE APPROXIMATE.

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FIGURE 9: VAPOR BARRIER LAYOUT AND DESIGN

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APPENDIX 1

SITE PLAN AND DEVELOPMENT PLANS

THE IMPLEMENTATION OF THESE DRAWINGS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BRING TO ARCHITECT'S ATTENTION IN WRITING ANY DISCREPANCIES IN THESE PLANS. THE CONTRACTOR SHALL SUBMIT TO ARCHITECT FOR APPROVAL ALL SHOP DRAWINGS AND SPECIFICATIONS RELATED TO THIS PROJECT.

SPECIAL INSPECTION ITEMS

ALL MATERIALS DESIGNATED FOR "CONTROLLED INSPECTION" SHALL BE INSPECTED AND/ OR TESTED TO VERIFY COMPLIANCE WITH CODE REQUIREMENTS, UNLESS OTHERWISE SPECIFICALLY PROVIDED BY CODE PROVISIONS. ALL REQUIRED INSPECTIONS AND TESTS OF MATERIAL SHALL BE MADE AND / OR WITNESSED BY OR ON BEHALF OF THE OWNER OR LESSEE.

STRUCTURAL COLD FORMED STEEL	BC 1704.3.4
CONCRETE - CAST IN PLACE	BC 1704.4
SUBGRADE INSPECTION	BC 1704.7.1
EXTERIOR INSULATION FINISH SYSTEM (EIFS)	BC 1704.13
MECHANICAL SYSTEM	BC 1704.16
EXCAVATION - SHEETING, SHORING, AND BRACING	BC 1704.20.2
ON SITE STORM DRAINAGE DISPOSAL AND DETENTION SYSTEM	BC 1704.21.2
FIRE RESISTANT PENETRATIONS AND JOINTS	BC 1704.27
CONCRETE DESIGN MIX	BC 1905.3
CONCRETE SAMPLING AND TESTING	BC 1905.6

LIST OF PROGRESS INSPECTIONS

FOOTING AND FOUNDATION..........	BC 109.3.1
ENERGY CODE COMPLIANCE INSPECTIONS..........	BC 109.3.5
FIRE-RESISTANCE RATED CONSTRUCTION..........	BC 109.3.4

LIST OF ENERGY CODE PROGRESS INSPECTIONS:

PROTECTION OF FOUNDATION INSULATION	(IA1), (IIA1)
INSULATION PLACEMENT & R VALUES	(IA1), (IIA1)
FENESTRATION THERMAL VALUES AND RATINGS	(IA3), (IIA3)
FENESTRATION RATINGS FOR LEAKAGE	(IA4), (IIA4)
FENESTRATION AREAS	(IA5), (IIA5)
AIR SEALING AND INSULATION - VISUAL	(IA6), (IIA6)
DUMPERS INTEGRAL TO BUILDING ENVELOPE	(IB2), (IIB2)
HVAC AND SERVICE WATER HEATING EQUIPMENT	(IB3), (IIB3)
HVAC AND SERVICE WATER HEATING SYSTEM CONTROLS	(IB4), (IIB4)
DUCT PLENUM AND PIPING INSULATION AND SEALING	(IB5), (IIB5)
DUCT LEAKAGE TESTING	(IB6), (IIB6)
ELECTRICAL METERING	(IC1), (IIC1)
LIGHTING IN DWELLING UNITS	(IC2), (IIC2)
INTERIOR LIGHTING POWER	(IIC3)
EXTERIOR LIGHTING POWER	(IIC4)
LIGHTING CONTROLS	(IIC5)
EXIT SIGNS	(IIC6)
ELECTRICAL MOTORS	(IIC7)
MAINTENANCE INFORMATION	(ID1), (IID1)

WORK TYPES ON A SEPARATE APPLICATION:
1) SPRINKLERS
2) SIDEWALK SHED
3) DEMOLITION
4) BPP
5) SD 1#2
6) MECHANICAL
7) PLUMBING
8) FIRE ALARM
9) ELEVATOR

ABBREVIATIONS

A.H.	AIR HANDLER	M.D.L.	MULTIPLE DWELLING LAW
CONC.	CONCRETE	O.C.	ON CENTER
DIAM.	DIAMETER	@	AT
EL.	ELEVATION	CL.	CLOSET
FT. '	FEET	DN	DOWN
IN. "	INCHES	W.C.	WATER CLOSET
LAV	LAVATORY	SPKLR	SPRINKLER
MIN.	MINIMUM	RGE	RANGE
S.F.	SQUARE FEET	REF	REFRIGERATOR
TYP.	TYPICAL	D.W.	DISH WASHER
V.T.R.	VENT THROUGH ROOF	Z.R.	ZONING RESOLUTION
W.H.	WATER HEATER	MAX.	MAXIMUM
BC.	BUILDING CODE	F.A.I.	FRESH AIR INTAKE
WIN.	WINDOW	NO.	NUMBER
REF	REFRIGERATOR	D.U.	DWELLING UNITS
RS	REFERENCE STANDARD	CMU	CONCRETE MASONRY UNIT
CAB.	CABINET	NA	NOT APPLICABLE
12" D.A.	12" DROP ARCH	D.O.B.	DEPARTMENT OF BUILDING

LIST OF DRAWINGS:

GENERAL:
Z-001.00 ZONING ANALYSIS
Z-002.00 PLOT PLAN, AREAS DIAGRAMS
Z-003.00 FENESTRATION COMPLIANCE
G-001.00 CODE ANALYSIS
G-002.00 GENERAL NOTES

ARCHITECTURAL:
A-001.00 CELLAR PLAN
A-002.00 FIRST FLOOR PLAN
A-003.00 SECOND FLOOR PLAN
A-004.00 THIRD FLOOR PLAN
A-005.00 FOURTH FLOOR PLAN
A-006.00 FIFTH FLOOR PLAN
A-007.00 SIXTH FLOOR PLAN
A-008.00 SEVENTH FLOOR PLAN
A-009.00 ROOF PLAN

A-100.00 FRONT ELEVATION
A-101.00 REAR ELEVATION
A-102.00 RIGHT ELEVATION
A-103.00 LEFT ELEVATION
A-200.00 SECTION A-A
A-201.00 SECTION B-B

ZONING INFORMATION

LOCATION: 1353 FLATBUSH AVENUE BROOKLYN, N.Y.

ZONE: R7A AND R5B COMMERCIAL OVERLAY C2-4
MAP #: 23a BLOCK #: 5227 LOT #: 13, 15, 16
OCCUPANCY CLASS: R-2, RESIDENTIAL; M, MERCANTILE
ZONING USE GROUP: USE GROUP 2, RESIDENTIAL; USE GROUP 6a, RETAIL STORE
CONSTRUCTION CLASS: TYPE IB

LOT AREA:

A.	[(15'-11 1/2") (85'-0" + 76'-0 3/4")] / 2	= 1282.62 SF
B.	[(15'-11 1/2") (208'-4 3/4" + 198'-2 1/2")] / 2	= 3251.24 SF
C.	[(129'-6 1/2") (40'-6 3/4")] / 2	= 3016.08 SF
D.	[(65'-3 1/2") (14'-1 3/4")] / 2	= 460.27 SF
E.	[(15'-9") (95'-10 3/4" + 124'-3")] / 2	= 1733.63 SF
TOTAL LOT AREA:		= 9743.06 SF

LOT AREA ON R5B: 1891.33 SF
LOT AREA ON R7A: 7852.53 SF

ZR 23-17 SPECIAL PROVISIONS FOR ZONING LOTS DIVIDED BY DISTRICT BOUNDARIES OR SUBJECT TO DIFFERENT BULK REGULATIONS
R1 R2 R3 R4 R5 R6 R7 R8 R9 R10
IN ALL DISTRICTS, AS INDICATED, WHENEVER A ZONING LOT IS DIVIDED BY A BOUNDARY BETWEEN DISTRICTS OR IS SUBJECT TO BULK REGULATIONS RESULTING IN DIFFERENT MINIMUM REQUIRED OPEN SPACE RATIOS, DIFFERENT MAXIMUM FLOOR AREA RATIOS OR DIFFERENT LOT COVERAGES ON PORTIONS OF THE ZONING LOT, THE PROVISIONS SET FORTH IN ARTICLE VII, CHAPTER 7, SHALL APPLY.

ZR 77-12 APPLICATION OF USE REGULATIONS UNDER ALL OTHER CONDITIONS
WHENEVER A ZONING LOT IS DIVIDED BY A BOUNDARY BETWEEN DISTRICTS IN WHICH DIFFERENT USES ARE PERMITTED AND THE PROVISIONS OF SECTION 77-11 (CONDITIONS FOR APPLICATION OF USE REGULATIONS TO ENTIRE ZONING LOT) DO NOT APPLY, THE APPLICABLE USE REGULATIONS FOR EACH DISTRICT SHALL APPLY TO THAT PORTION OF THE ZONING LOT LOCATED WITHIN SUCH DISTRICT. THE REGULATIONS GOVERNING USE ARE SET FORTH IN ARTICLE II, CHAPTER 2; ARTICLE III, CHAPTER 2; AND ARTICLE IV, CHAPTER 2.

ZR 77-22 FLOOR AREA RATIO
THE MAXIMUM FLOOR AREA RATIO PERMITTED ON EACH PORTION OF SUCH ZONING LOT, EACH SUCH FLOOR AREA RATIO SHALL BE MULTIPLIED BY THE PERCENTAGE OF THE ZONING LOT TO WHICH SUCH FLOOR AREA RATIO APPLIES. THE SUM OF THE PRODUCTS THUS OBTAINED SHALL BE THE ADJUSTED MAXIMUM FLOOR AREA RATIO APPLICABLE TO SUCH ZONING LOT.

ZR 23-141 OPEN SPACE AND FLOOR AREA REGULATIONS IN R5B DISTRICTS
MAX FLOOR AREA RATIO: 1.35

ZR 23-952 FLOOR AREA COMPENSATION IN INCLUSIONARY HOUSING DESIGNATED AREAS (R7A DISTRICTS)
MAX FLOOR AREA RATIO: 3.45

ADJUSTED FLOOR AREA RATIO
LOT AREA ON R5B: 1891.33 SF (1.35) = 2553.29 SF
LOT AREA ON R7A: 7852.53 SF (3.45) = 27091.23 SF

TOTAL ADJUSTED MAX FLOOR AREA RATIO = 29644.52 SF (3.042)

ZR 35-31 MAXIMUM FLOOR AREA RATIO (MIXED BUILDINGS IN COMMERCIAL DISTRICTS)
C2-4 DISTRICTS, THE MAXIMUM FLOOR AREA RATIO PERMITTED FOR A COMMERCIAL USE SHALL BE AS SET FORTH IN ARTICLE III, CHAPTER 3, AND THE MAXIMUM FLOOR AREA RATIO PERMITTED FOR A RESIDENTIAL USE SHALL BE AS SET FORTH IN ARTICLE II, CHAPTER 3. PROVIDED THE TOTAL OF ALL SUCH FLOOR AREA RATIOS DOES NOT EXCEED THE GREATEST FLOOR AREA RATIO PERMITTED FOR ANY SUCH USE ON THE ZONING LOT.

ZR 33-121 IN DISTRICTS WITH BULK GOVERNED BY RESIDENCE DISTRICT BULK REGULATIONS
C2-4 DISTRICTS, FOR A ZONING LOT CONTAINING A COMMERCIAL USE, THE MAXIMUM FLOOR AREA RATIO IS DETERMINED BY THE RESIDENCE DISTRICT WITHIN WHICH SUCH COMMERCIAL DISTRICT IS MAPPED.

R7A, MAX FLOOR AREA RATIO FOR ZONING LOTS CONTAINING COMMERCIAL USE: 2.0
LOT AREA ON R7A: 7852.53 SF (2.0) = 15705.06 SF

FLOOR AREA TABULATION:

O.C.	U.G.	LOCATION	GROSS FLOOR AREA	DEDUCTIONS		NET FLOOR AREA
		CELLAR	7700.85 SQ. FT.			NOT COUNTED
M	6a	FIRST FLOOR (COMMERCIAL)	6551.06 SQ. FT.	DEDUCTION	6.00 SQ. FT.	6545.06 SQ. FT.
R-2	2	FIRST FLOOR (RESIDENTIAL)	1129.46 SQ. FT.	DEDUCTION	348.15 SQ. FT.	41.50 SQ. FT.
				WALL DEDUCTION	215.27 SQ. FT.	
				OPEN AREA	515.21 SQ. FT.	
R-2	2	SECOND FLOOR	4824.73 SQ. FT.	DEDUCTION	127.08 SQ. FT.	4470.76 SQ. FT.
				WALL DEDUCTION	226.89 SQ. FT.	
R-2	2	THIRD FLOOR	4824.73 SQ. FT.	DEDUCTION	127.08 SQ. FT.	4470.76 SQ. FT.
				WALL DEDUCTION	226.89 SQ. FT.	
R-2	2	FOURTH FLOOR	4140.29 SQ. FT.	DEDUCTION	113.63 SQ. FT.	3822.85 SQ. FT.
				WALL DEDUCTION	203.81 SQ. FT.	
R-2	2	FIFTH FLOOR	4140.29 SQ. FT.	DEDUCTION	113.63 SQ. FT.	3822.85 SQ. FT.
				WALL DEDUCTION	203.81 SQ. FT.	
R-2	2	SIXTH FLOOR	4140.29 SQ. FT.	DEDUCTION	113.63 SQ. FT.	3822.65 SQ. FT.
				WALL DEDUCTION	203.97 SQ. FT.	
R-2	2	PENTHOUSE FLOOR	2819.35 SQ. FT.	DEDUCTION	101.12 SQ. FT.	2535.07 SQ. FT.
				WALL DEDUCTION	183.16 SQ. FT.	
		TOTAL:	40370.05 SQ. FT.	DEDUCTIONS	3038.66 SQ. FT.	29531.54 SQ. FT.

TOTAL FLOOR AREA RATIO: 29531.54 SQ. FT. < 29644.52 SF: OK

ZR 77-24 LOT COVERAGE
THE MAXIMUM PERCENT OF LOT COVERAGE PERMITTED ON EACH PORTION OF A ZONING LOT SHALL BE DETERMINED UNDER THE APPLICABLE REGULATIONS OF ARTICLE II, CHAPTERS 3 AND 4. EACH SUCH MAXIMUM PERCENT OF LOT COVERAGE SHALL BE MULTIPLIED BY THE LOT AREA OF THE PORTION OF THE ZONING LOT TO WHICH SUCH PERCENT OF LOT COVERAGE APPLIES. THE SUM OF THE AREAS OF LOT COVERAGE THUS OBTAINED SHALL BE THE MAXIMUM AREA OF LOT COVERAGE FOR THE ZONING LOT. SUCH MAXIMUM AREA OF LOT COVERAGE, DIVIDED BY THE LOT AREA OF THE ZONING LOT, SHALL BE THE ADJUSTED MAXIMUM PERCENT OF LOT COVERAGE FOR THE ZONING LOT.

ADJUSTED LOT COVERAGE
LOT AREA ON R5B: 1891.33 SF (55%) = 1040.23 SF
LOT AREA ON R7A: 7852.53 SF (65%) = 5104.14 SF

TOTAL ADJUSTED MAX LOT COVERAGE = 6144.37 SF (63.05%)

LOT COVERAGE:

A.	[(17'-6") (54'-1 1/2" + 44'-3 1/2")] / 2	= 841.94 SF
B.	[(38'-4") (56'-2 1/2" + 58'-3 1/2")] / 2	= 1865.14 SF
C.	[(17'-1") (21'-3" + 12'-2")] / 2	= 285.46 SF
D.	(36'-8 1/2") (37'-0")	= 1157.16 SF
E.	[(47'-4 1/2") (10'-0 1/2")] / 2	= 262.34 SF
F.	[(40'-2 1/2") (37'-0" + 22'-7 1/2")] / 2	= 1526.42 SF
G.	(6'-8") (11'-5 1/2")	= 60.13 SF
H.	(1'-7 1/2") (3'-4")	= 8.12 SF
I.	(1'-0") (1'-0")	= 0.83 SF
J.	(1'-0") (1'-0")	= 0.83 SF
K.	(1'-0") (8")	= 0.55 SF
TOTAL LOT AREA:		= 6008.99 SF (61.66%) < 63.05 OK

ZR 77-25 DENSITY REQUIREMENTS
WHENEVER A ZONING LOT IS DIVIDED BY A BOUNDARY BETWEEN DISTRICTS WITH DIFFERENT DENSITY REQUIREMENTS, THE MAXIMUM NUMBER OF DWELLING UNITS OR ROOMING UNITS PERMITTED ON THE ZONING LOT SHALL EQUAL THE SUM OF THE MAXIMUM NUMBER OF DWELLING UNITS OR ROOMING UNITS PERMITTED FOR EACH PORTION OF THE ZONING LOT IN ACCORDANCE WITH THE APPLICABLE DISTRICT REGULATIONS.

ZR 23-22 MAXIMUM NUMBER OF DWELLING UNITS OR ROOMING UNITS
R5B 2553.29 SF / 1350 = 1.89
R7A 27091.23 SF / 680 = 39.84
TOTAL = 41.73 = 42
PROPOSED D.U. = 35 < 42 D.U. OK

ZR 77-27 YARD REGULATIONS
EACH PORTION OF THE ZONING LOT SHALL BE GOVERNED BY THE YARD REGULATIONS SPECIFIED FOR THE DISTRICT IN WHICH IT IS LOCATED.

ZR 23-45 MINIMUM REQUIRED FRONT YARDS
R7A: NOT REQUIRED
PROPOSED: NONE

ZR 23-46 MINIMUM REQUIRED SIDE YARDS
ZR 23-462 SIDE YARDS FOR ALL OTHER BUILDINGS CONTAINING RESIDENCES
(C) R7 DISTRICTS, NO SIDE YARDS ARE REQUIRED.
HOWEVER, IF ANY OPEN AREA EXTENDING ALONG A SIDE LOT LINE IS PROVIDED AT ANY LEVEL, IT SHALL MEASURE AT LEAST EIGHT FEET WIDE FOR THE ENTIRE LENGTH OF THE SIDE LOT LINE.
PROPOSED: NONE

ZR 23-47 MINIMUM REQUIRED REAR YARDS
R7A: 30'-0" REAR YARD REQUIRED
EXCEPT AS OTHERWISE PROVIDED IN SECTIONS 23-53 (SPECIAL PROVISIONS FOR THROUGH LOTS).

ZR 23-532 REQUIRED REAR YARD EQUIVALENTS
R7 DISTRICTS, AS INDICATED, ON ANY THROUGH LOT THAT IS 110 FEET OR MORE IN MAXIMUM DEPTH FROM STREET TO STREET, ONE OF THE FOLLOWING REAR YARD EQUIVALENTS SHALL BE PROVIDED: HOWEVER, IN R7A DISTRICTS, ON ANY THROUGH LOT AT LEAST 180 FEET IN MAXIMUM DEPTH FROM STREET TO STREET, A REAR YARD EQUIVALENT SHALL BE PROVIDED ONLY AS SET FORTH IN PARAGRAPH (A) OF THIS SECTION. ANY SUCH REAR YARD EQUIVALENT SHALL BE UNOBSTRUCTED FROM ITS LOWEST LEVEL TO THE SKY.
(A) AN OPEN AREA WITH A MINIMUM DEPTH OF 60 FEET, MIDWAY (OR WITHIN FIVE FEET OF BEING MIDWAY) BETWEEN THE TWO STREET LINES UPON WHICH SUCH THROUGH LOT FRONTS.

PROPOSED: 30' REAR YARD
60' AT MIDWAY OF THROUGH LOT

ZR 33-23 PERMITTED OBSTRUCTIONS IN REQUIRED YARDS OR REAR YARD EQUIVALENTS
(B) IN ANY REAR YARD OR REAR YARD EQUIVALENT:
(3) ANY BUILDING OR PORTION OF A BUILDING USED FOR ANY PERMITTED USE OTHER THAN RESIDENCES, AND PROVIDED THAT THE HEIGHT OF SUCH BUILDING SHALL NOT EXCEED ONE STORY, EXCLUDING BASEMENT, NOR IN ANY EVENT 23 FEET ABOVE CURB LEVEL.

ZR 77-28 HEIGHT AND SETBACK REGULATIONS
EACH PORTION OF SUCH ZONING LOT SHALL BE REGULATED BY THE HEIGHT AND SETBACK PROVISIONS APPLICABLE TO THE DISTRICT IN WHICH SUCH PORTION OF THE ZONING LOT IS LOCATED.

ZR 23-633 STREET WALL LOCATION AND HEIGHT AND SETBACK REGULATIONS IN CERTAIN DISTRICTS
(A) STREET WALL LOCATION
(1) R7A DISTRICTS, FOR ALL BUILDINGS, AND FOR QUALITY HOUSING BUILDINGS ON WIDE STREETS, THE STREET WALL SHALL BE LOCATED NO CLOSER TO THE STREET LINE THAN THE CLOSEST STREET WALL OF AN EXISTING BUILDING TO SUCH STREET LINE, LOCATED ON THE SAME BLOCK, AND WITHIN 150 FEET OF SUCH BUILDING. HOWEVER, A STREET WALL NEED NOT BE LOCATED FURTHER FROM THE STREET LINE THAN 15 FEET.

(B) SETBACK REGULATIONS
(1) AT A HEIGHT NOT LOWER THAN THE MINIMUM BASE HEIGHT OR HIGHER THAN THE MAXIMUM BASE HEIGHT, A SETBACK WITH A DEPTH OF AT LEAST 10 FEET SHALL BE PROVIDED FROM ANY STREET WALL FRONTING ON A WIDE STREET.
PROPOSED SETBACK: 10'-0"

(C) MAXIMUM BUILDING HEIGHT
R7A DISTRICT

	REQUIRED	PROPOSED
MINIMUM BASE HEIGHT:	40'	
MAXIMUM BASE HEIGHT:	65'	64'-6"
MAXIMUM BUILDING HEIGHT:	80'	75'

ZR 77-30 OFF-STREET PARKING AND LOADING REGULATIONS
ZR 77-321 PROVISIONS GOVERNING OFF-STREET PARKING FOR RESIDENCES
THE PERCENTAGE REQUIREMENTS FOR ACCESSORY OFF-STREET PARKING FOR RESIDENCES APPLICABLE TO EACH PORTION OF THE ZONING LOT SHALL BE MULTIPLIED BY THE PERCENTAGE OF THE TOTAL LOT AREA OF THE ZONING LOT TO WHICH EACH SUCH REQUIREMENT APPLIES. THE SUM OF THE PRODUCTS OBTAINED SHALL BE THE PERCENTAGE REQUIREMENT APPLICABLE TO RESIDENCES ON SUCH ZONING LOT. SUCH OFF-STREET PARKING SPACES MAY BE LOCATED ANYWHERE ON THE ZONING LOT WITHOUT REGARD TO DISTRICT BOUNDARIES.

ZR 25-23 NUMBER OF SPACES WHERE GROUP PARKING FACILITIES ARE PROVIDED
R7A - 50% OF D.U. FOR QUALITY HOUSING
PROPOSED 36 DWELLING UNITS
MIN. SPACES REQUIRED = 18

R5B - 66% OF D.U. FOR QUALITY HOUSING
PROPOSED 0 DWELLING UNITS
MIN. SPACES REQUIRED = 0

ZR 25-241 REDUCED REQUIREMENTS
R7 DISTRICTS, FOR ZONING LOTS OF 10,000 OR 15,000 SQUARE FEET OR LESS, THE NUMBER OF REQUIRED ACCESSORY OFF STREET PARKING SPACES IS AS SET FORTH IN THE FOLLOWING TABLE:
R7A: 30%
36 (30%) = 10.8

ZR 25-26 WAIVER OF REQUIREMENTS FOR SMALL NUMBER OF SPACES
ZR 25-261 WAIVER FOR NEW DEVELOPMENTS
R7A MAX. 15 SPACES
11 - 15 = -4
THEREFORE 0 PARKING SPACES ARE REQUIRED
PARKING PROVIDED: 4 PARKING SPACES

ZR 36-20 REQUIRED ACCESSORY OFF-STREET PARKING SPACES FOR COMMERCIAL OR COMMUNITY FACILITY USES
C2-4 GENERAL RETAIL OR SERVICE USES
1 PER 1,000 SQ. FT. OF FLOOR AREA
12275.62 / 1000 = 12.27
MIN. SPACES REQUIRED = 12

ZR 36-23 WAIVER OF REQUIREMENTS FOR SPACES BELOW MINIMUM NUMBER
ZR 36-232 C2-4 MAX. 40 SPACES
12 - 40 = -28
THEREFORE 0 PARKING SPACES ARE REQUIRED

ZR 25-72 REQUIRED ACCESSORY OFF-STREET LOADING BERTHS
R7 DISTRICT
COMMERCIAL USES IN LARGE-SCALE RESIDENTIAL DEVELOPMENTS
FIRST 25,000 - NONE (COMMERCIAL FLOOR AREA 1ST FLOOR 6,551.06)
NON LOADING BERTHS REQUIRED

ZR 25-811 BICYCLE PARKING:
NUMBER OF REQUIRED PARKING SPACES = 1 PER 2 UNITS:
PROPOSED NUMBER OF UNITS = 36
NUMBER OF PARKING REQUIRED= 36/2= 18 PARKING SPACES.

VICINITY MAP

23a

QUALITY HOUSING REQUIREMENTS

Z.R. 28-10 NEIGHBORHOOD IMPACT

Z.R. 28-11 BULK REGULATIONS
THE BULK REGULATIONS FOR QUALITY HOUSING BUILDINGS ARE SET FORTH IN THE PROVISIONS APPLICABLE TO THE QUALITY HOUSING PROGRAM IN ARTICLE II, CHAPTER 3; ARTICLE II, CHAPTER 4; ARTICLE III, CHAPTER 4 AND ARTICLE III, CHAPTER 5.

Z.R. 28-12 ONE TREE PER 25'-0" OF STREET FRONTAGE OF ZONING LOT
FRONTAGE OF ZONING LOT: 115'-4" + 16'-0 1/2" = 131.37
FRONTAGE OF ZONING LOT 131.37/25'=5.25
FIVE (5) TREES REQUIRED

Z.R. 28-20 BUILDING INTERIOR

Z.R. 28-21 DWELLING UNIT SHALL AN AREA OF AT LEAST 400 S.F.
MIN PROPOSED DWELLING UNIT SIZE: 441.25 S.F. > 400 S.F. OK

Z.R. 28-22 WINDOWS SHALL BE DOUBLE GLAZED

Z.R. 28-23 REFUSE STORAGE AND DISPOSAL REQUIRED FOR 9.0 D.U AND MORE.
PROPOSED D.U. 36(<9 D.U). REFUSE STORAGE PROPOSED AT EACH FLOOR.

Z.R. 28-31 RECREATIONAL AREAS REQUIRES FOR 9 D.U. AND MORE.
PROPOSED D.U. 36(<9 D.U). RECREATIONAL AREA @ 1ST FLOOR.
MINIMUM REQUIRED RECREATION SPACE R7A: 3.3 %
29644.47 SQ. FT. (3.3%) = 978.26 SQ. FT.
PROPOSED RECREATION AREA:
INDOOR: 349.26 SQ.FT.
OUTDOOR: 632.23 SQ.FT.

Z.R. 28-32 STANDARDS FOR RECREATION SPACE
(A) ALL RECREATION SPACE SHALL BE ACCESSIBLE TO THE RESIDENTS OF THE BUILDING. IN A MIXED USE BUILDING, THE RECREATION SPACE SHALL BE ACCESSIBLE ONLY FROM THE RESIDENTIAL PORTION OF THE BUILDING.
(B) THE MINIMUM DIMENSION OF ANY RECREATION SPACE SHALL BE 15 FEET. THE MINIMUM SIZE OF ANY OUTDOOR RECREATION SPACE SHALL BE 225 SQUARE FEET, AND THE MINIMUM SIZE OF ANY INDOOR RECREATION SPACE SHALL BE 300 SQUARE FEET.
(C) OUTDOOR RECREATION SPACE SHALL BE OPEN TO THE SKY EXCEPT THAT BUILDING PROJECTIONS, NOT TO EXCEED SEVEN FEET IN DEPTH, MAY COVER UP TO TEN PERCENT OF THE OUTDOOR RECREATION SPACE, PROVIDED THAT THE LOWEST LEVEL OF THE PROJECTION IS AT LEAST TEN FEET ABOVE THE LEVEL OF THE OUTDOOR RECREATION SPACE.
(D) ANY INDOOR RECREATION ROOM LOCATED IN A STORY SHALL HAVE AT LEAST ONE EXTERIOR WALL WITH WINDOWS THAT MEASURE NOT LESS THAN 9.5 PERCENT OF THE TOTAL FLOOR SPACE OF THE ROOM.

Z.R. 28-33 THE AREA OF THE ZONING LOT BETWEEN THE STREET LINE AND THE STREET WALL OF THE BUILDING SHALL BE PLANTED, EXCEPT AT THE ENTRANCES TO AND EXITS FROM THE BUILDING, PURSUANT TO THE PROVISIONS OF SECTION 23-892.

Z.R. 28-50 PARKING FOR QUALITY HOUSING
EXCEPT AS MODIFIED BY THE PROVISIONS OF THIS SECTION, ACCESSORY OFF-STREET PARKING SHALL BE PROVIDED AS SET FORTH IN THE APPLICABLE UNDERLYING DISTRICT REGULATIONS. (Z.R. 25-23.)

Z.R. 28-51 SCREENING
NO PARKING PROVIDED THEREFORE NO SCREENING REQUIRED.

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SEAL

Accepted For OPPN #1/04
Professional Certification
BROOKLYN
Date: DEC 2 3 2015

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AIA ASSOCIATE
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PROJECT ADDRESS:
1353 FLATBUSH AVENUE BROOKLYN, NY

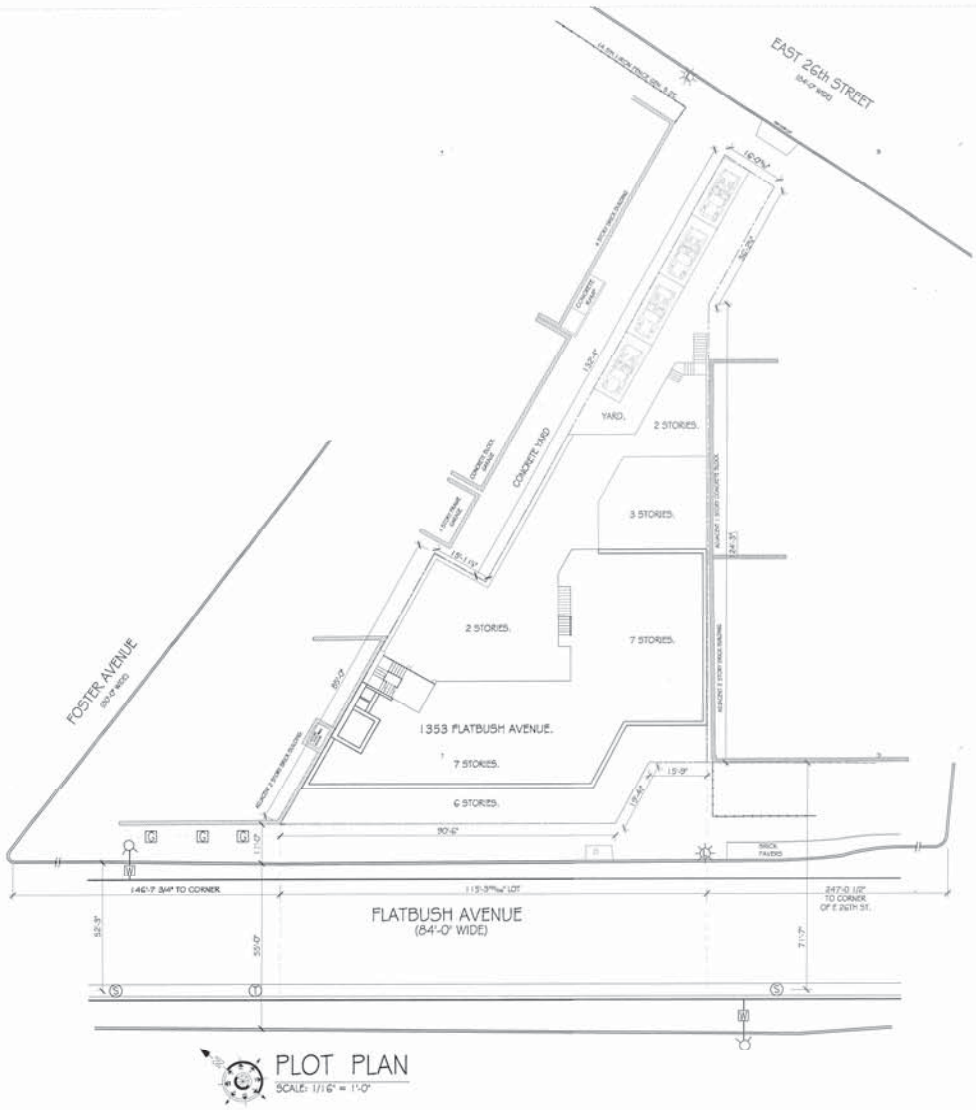
ZONING INFO.

DWG No.
Z-001.00

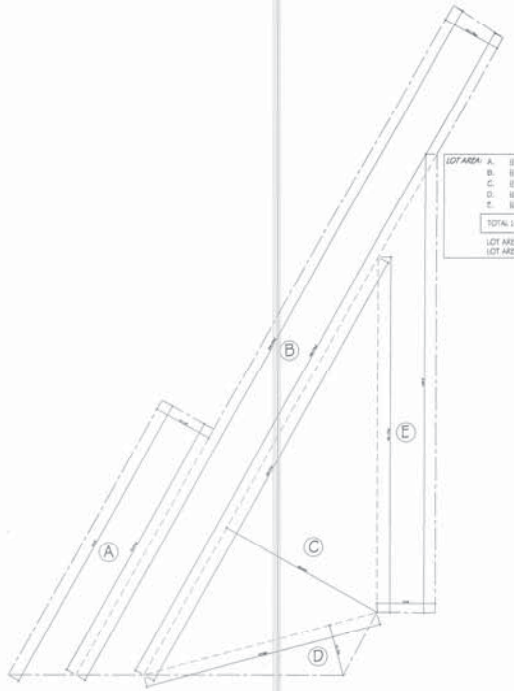
DEPT. BLDGS Job No. 310131676
Scan Code ESHS7623606

PAGE:

THE IMPLEMENTATION OF THESE DRAWINGS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BRING TO ARCHITECT'S ATTENTION IN WRITING ANY DISCREPANCIES IN THESE PLANS. THE CONTRACTOR SHALL SUBMIT TO ARCHITECT FOR APPROVAL ALL SHOP DRAWINGS AND SPECIFICATIONS RELATED TO THIS PROJECT.

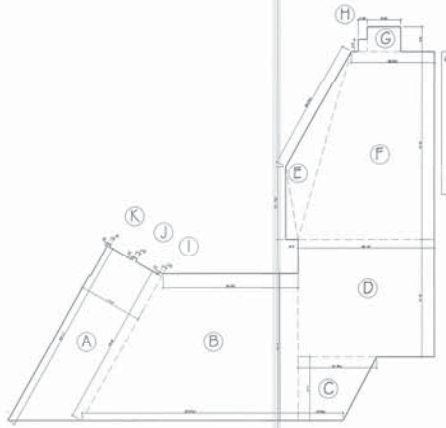


PLOT PLAN
SCALE: 1/16" = 1'-0"



LOT AREA:

A.	(115'-11 3/4") (85'-0" + 76'-0 7/8") / 2	=	1282.62 SF
B.	(115'-11 3/4") (208'-4 3/4" + 156'-2 7/8") / 2	=	3251.24 SF
C.	(129'-6 3/4") (46'-6 7/8") / 2	=	3016.08 SF
D.	(65'-3 3/4") (14'-1 3/8") / 2	=	460.27 SF
E.	(15'-9") (85'-10 3/4" + 124'-3 5/8") / 2	=	1733.63 SF
TOTAL LOT AREA:		=	9743.86 SF
LOT AREA ON R5B:			1691.33 SF
LOT AREA ON R7A:			7552.53 SF



LOT COVERAGE:

A.	(17'-4") (54'-1 1/2" + 44'-3 7/8") / 2	=	841.34 SF
B.	(39'-4") (30'-6 3/4" + 56'-3 7/8") / 2	=	1665.14 SF
C.	(17'-1") (21'-3" + 12'-2 5/8") / 2	=	285.46 SF
D.	(30'-6 3/4") (37'-0")	=	1157.18 SF
E.	(47'-4 3/4") (10'-0 7/8") / 2	=	262.34 SF
F.	(46'-2 3/4") (37'-0" + 22'-7 3/4") / 2	=	1526.42 SF
G.	(2'-8") (11'-5 3/4")	=	60.13 SF
H.	(11'-7 3/4") (3'-4")	=	6.12 SF
I.	(1'-0") (1'-0")	=	0.53 SF
J.	(1'-0") (1'-0")	=	0.53 SF
K.	(1'-0") (1'-0")	=	0.55 SF
TOTAL LOT AREA:		=	6006.99 SF

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PLOT PLAN
LOT AREA DIAGRAM
LOT COVERAGE DIAGRAM

DWG No.
Z-002.00

DOB# 310133975
Work Order No. E1400109490

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AREA WEIGHTED AVARAGE CALCULATION

	AREA A	U-FACTOR (PROPOSED) B	UA (PROPOSED) C=A*B	U-FACTOR (CODE MAX) D	UA (CODE) E=A*D
WALL A	685.84	0.018	12.35	0.064	43.89
WALL B	1783.59	0.018	32.10	0.064	114.15
WALL C	343.56	0.018	6.18	0.064	21.99
WALL D	377.99	0.018	6.80	0.064	24.19
WALL E	5118.75	0.018	92.14	0.064	327.60
WALL F	388.55	0.018	6.99	0.064	24.87
WALL G	191.44	0.018	3.45	0.064	12.25
WALL H	238.75	0.018	4.30	0.064	15.28
WALL I	352.03	0.018	6.34	0.064	22.53
WALL J	2513.33	0.018	45.24	0.064	160.85
WALL K	143.36	0.018	2.58	0.064	9.18
WALL L	1338.47	0.018	24.09	0.064	85.66
WALL M	81.59	0.018	1.47	0.064	5.22
WALL N	110.00	0.018	1.98	0.064	7.04
WALL O	1432.30	0.018	25.78	0.064	91.67
WALL P	753.58	0.018	13.56	0.064	48.23
WALL Q	188.89	0.018	3.40	0.064	12.09
WALL R	738.50	0.018	13.29	0.064	47.26
WALL S	779.16	0.018	14.02	0.064	49.87
WALL T	183.33	0.018	3.30	0.064	11.73
WALL U	389.67	0.018	7.01	0.064	24.94
WALL V	60.75	0.018	1.09	0.064	3.89
WALL W	57.95	0.018	1.04	0.064	3.71
WALL X	620.50	0.018	11.17	0.064	39.71
OPAQUE WALL TOTAL	**18871.88**		**339.69**		**1207.80**
WALL A - WIN. 10	662.91	0.21	139.21	0.40	265.16
WALL B - WIN. 01	1349.72	0.21	283.44	0.40	539.89
WALL B - WIN. 03	358.33	0.21	75.25	0.40	143.33
WALL B - WIN. 1ST FL.	841.69	0.28	235.67	0.40	336.68
WALL C - WIN. 05	668.88	0.21	140.46	0.40	267.55
WALL C - WIN. 1ST FL.	244.22	0.28	68.38	0.40	97.69
WALL D - WIN. 06	477.77	0.21	100.33	0.40	191.11
WALL D - WIN. 1ST FL.	31.66	0.28	8.86	0.40	12.66
WALL D - WIN. 1ST FL.	43.61	0.28	12.21	0.40	17.44
WALL D - Entry Door. 1ST FL.	92.77	0.32	29.69	0.40	37.11
WALL E	0.00	0.00	0.00	0.40	0.00
WALL F - WIN. 00	134.97	0.21	28.34	0.40	53.99
WALL F - WIN. 00	102.72	0.21	21.57	0.40	41.09
WALL F - WIN. 1ST FL.	227.12	0.28	63.59	0.40	90.85
WALL F - WIN. 1ST FL.	49.37	0.28	13.82	0.40	19.75
WALL F - WIN. 1ST FL.	116.38	0.28	32.56	0.40	46.52
WALL F - DOOR. 1ST FL.	46.38	0.48	22.26	0.40	18.55
WALL G - WIN. 1ST FL.	314.90	0.28	88.17	0.40	125.96
WALL G - WIN. 1ST FL.	72.41	0.28	20.27	0.40	28.96
WALL H	0.00	0.00	0.00	0.40	0.00
WALL I - WIN. 1ST FL.	247.97	0.28	69.43	0.40	99.19
WALL J	0.00	0.00	0.00	0.40	0.00
WALL K - WIN. 00	134.97	0.21	28.34	0.40	53.99
WALL L - WIN. 00	74.05	0.21	15.55	0.40	29.62
WALL L - WIN. 00	630.66	0.21	132.44	0.40	252.26
WALL L - WIN. 00	256.80	0.21	53.93	0.40	102.72
WALL L - WIN. 00	68.08	0.21	14.30	0.40	27.23
WALL L - DOOR 00	594.44	0.48	285.33	0.40	237.78
WALL M - WIN. 00	50.76	0.21	10.66	0.40	20.30
WALL M - WIN. 00	34.06	0.21	7.15	0.40	13.62
WALL M - DOOR 00	148.61	0.48	71.33	0.40	59.44
WALL N	0.00	0.00	0.00	0.40	0.00
WALL O - WIN. 00	394.16	0.21	82.77	0.40	157.66
WALL O - WIN. 00	359.52	0.21	75.50	0.40	143.81
WALL O - WIN. 00	340.41	0.21	71.49	0.40	136.16
WALL O - DOOR 00	148.61	0.48	71.33	0.40	59.44
WALL P - WIN. 00	67.48	0.21	14.17	0.40	26.99
WALL P - WIN. 00	52.55	0.21	11.04	0.40	21.02
WALL P - DOOR 00	29.72	0.48	14.27	0.40	11.89
WALL Q - DOOR 00	148.61	0.48	71.33	0.40	59.44
WALL R - DOOR 00	436.91	0.48	209.72	0.40	174.76
WALL S	0.00	0.00	0.00	0.40	0.00
WALL T	0.00	0.00	0.00	0.40	0.00
WALL U - WIN. 00	51.56	0.21	10.83	0.40	20.62
WALL U - WIN. 00	31.05	0.21	6.52	0.40	12.42
WALL U - DOOR 00	133.75	0.48	64.20	0.40	53.50
WALL V - WIN. 00	132.58	0.21	27.84	0.40	53.03
WALL W - WIN. 00	52.55	0.21	11.04	0.40	21.02
WALL W - DOOR 00	107.00	0.48	51.36	0.40	42.80
WALL X - WIN. 00	506.16	0.21	106.29	0.40	202.46
FENESTRATION TOTAL	**11118.73**		**2962.77**		**4447.09**
EXTERIOR TOTAL GROSS	**29990.61**		**3322.47**		**5655.29**

ENERGY EFFIENCY OF OPAQUE WALL COMPARING PROPOSED WITH CODE REQUIREMENTS

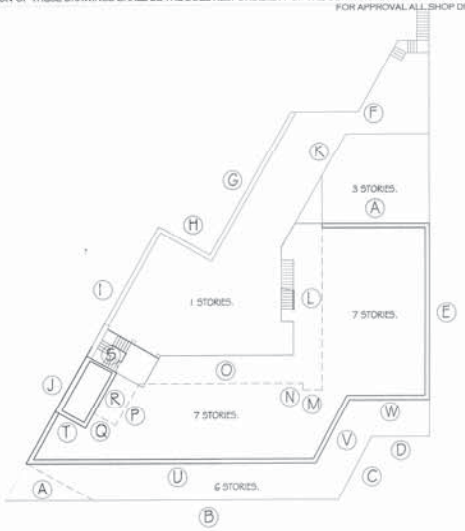
TOTAL UA OPAQUE WALL (PROPOSED) / TOTAL UA OPAQUE WALL (CODE) = 339.69 / 1207.80 x 100=	**28.13 %**
ENERGY EFFICIENCY ALLOWABLE PER ZR 12-10 (12)(iii)(1)=	80.00 %

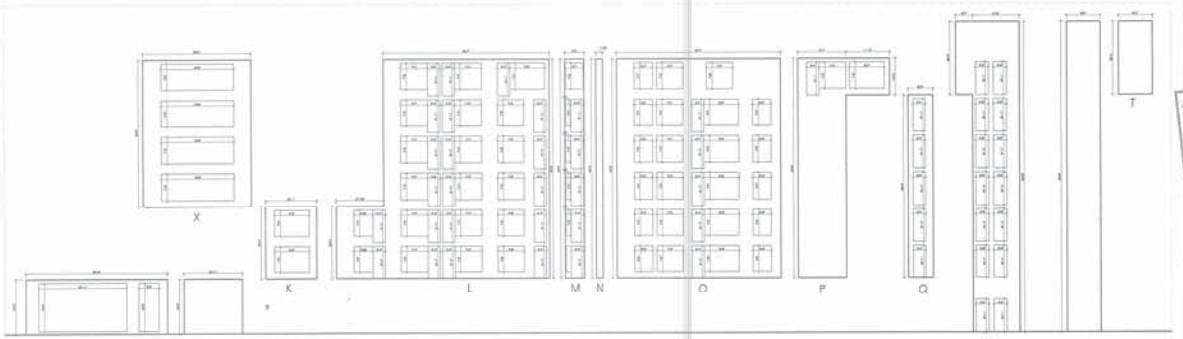
ENERGY EFFIENCY OF GROSS WALL COMPARING PROPOSED WITH CODE REQUIREMENTS

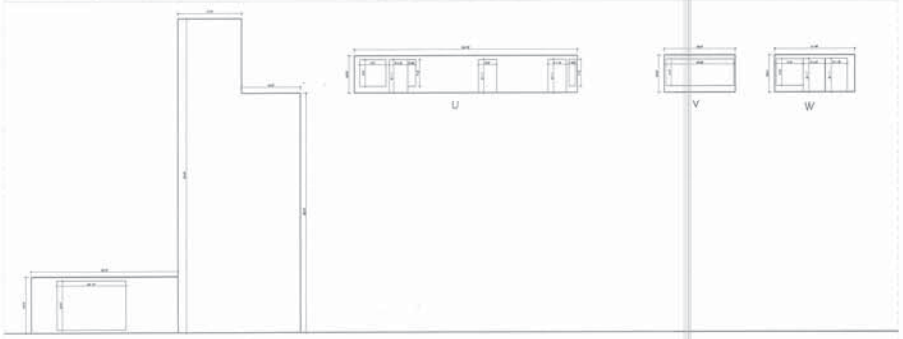
EXT. GROSS WALL UA (PROPOSED) / EXT. GROSS WALL UA (CODE) = 3322.47 / 5655.29 x 100=	**70.00 %**
ENERGY EFFICIENCY ALLOWABLE PER ZR 12-10 (12)(iii)(2)=	90.00 %

VERTICAL FENESTRATION AREA ALLOWED

TOTAL FENESTRATION (PROPOSED) / EXT. GROSS WALL (PROPOSED) = 11118.73 / 29990.61 x 100=	**37.07 %**
VERTICAL FENESTRATION AREA ALLOWED PER NYECC 502.1.2	40.00 %







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BUILDING CODE COMPLIANCE:

APPLICABLE CODE: 2014 NEW YORK CITY BUILDING CODE.
CONSTRUCTION TYPE: IB NON-COMBUSTIBLE.
SPRINKLERS: AUTOMATIC SPRINKLER SYSTEM.
FIRE DISTRICT: BUILDING LOCATED WITHIN FIRE DISTRICT (BROOKLYN)
FLOOD ZONE: FLOOD ZONE X; OUTSIDE OF 100 YEAR FLOOD AREA
~~"E" DESIGNATION: E-185 CEQR #07DCP070K~~
APPLICATION # 07044?2MK

CONSTRUCTION SUMMARY:
THIS WORK APPLICATION IS FOR THE CONSTRUCTION OF A NEW 6 STORY MIXED BUILDING WITH COMMERCIAL USES ON THE 1ST FLOOR, AND 35 RESIDENTIAL APARTMENTS IN THE FLOORS ABOVE. THE DEVELOPMENT WILL ALSO
INCLUDE UTILITY SPACES IN THE CELLAR.
ALL SPACES WITHIN THE BUILDINGS WILL BE PROTECTED BY AN AUTOMATIC SPRINKLER SYSTEM. THE BUILDING WILL BE SERVED BY 2 EXIT STAIRS AND BY 1 ELEVATOR. THE BUILDING WILL BE NON-COMBUSTIBLE CONSTRUCTION.

THE FOLLOWING WORK WILL BE PART OF SUBSEQUENT APPLICATIONS:
SOE, STRUCTURE, MECHANICAL, PLUMBING, FIRE PROTECTION, FIRE ALARM

BUILDING CLASSIFICATION STATEMENT (BC 106.4)
BC 302.1 OCCUPANCY CLASSIFICATION:
GROUP R-2 RESIDENTIAL (FLOORS 2 THRU 6)
GROUP M MERCANTILE (1ST FLOOR RETAIL)
GROUP S-1 STORAGE (CELLAR)

BC 602 CONSTRUCTION CLASS:
TYPE IB / COLUMNS MEET IA

BC 502.1 HEIGHT OF BUILDING: 75'-0"
HIGHEST LEVEL OF FIRE DEPARTMENT ACCESS: ROOF LEVEL
LOWEST LEVEL OF FIRE DEPARTMENT ACCESS: CELLAR LEVEL
MULTIPLE DWELLING CLASSIFICATION: HAEA

CHAPTER 4:

SECTION BC 420 GROUPS I-1, R-1, R-2, R-3
420.1 GENERAL. OCCUPANCIES IN GROUPS I-1, R-1, R-2 AND R-3 SHALL COMPLY WITH THE PROVISIONS OF THIS SECTION AND OTHER APPLICABLE PROVISIONS OF THIS CODE.
420.2 SEPARATION WALLS. WALLS SEPARATING DWELLING UNITS IN THE SAME BUILDING, WALLS SEPARATING SLEEPING UNITS IN THE SAME BUILDING AND WALLS SEPARATING DWELLING OR SLEEPING UNITS FROM OTHER OCCUPANCIES CONTIGUOUS TO THEM IN THE SAME BUILDING SHALL BE CONSTRUCTED AS FIRE BARRIERS CONSTRUCTED IN ACCORDANCE WITH SECTION 707 AND SHALL BE AT LEAST 1-HOUR FIRE-RESISTANCE- RATED.
420.3 HORIZONTAL SEPARATION. FLOOR ASSEMBLIES SEPARATING DWELLING UNITS IN THE SAME BUILDINGS, FLOOR ASSEMBLIES SEPARATING SLEEPING UNITS IN THE SAME BUILDING AND FLOOR ASSEMBLIES SEPARATING DWELLING OR SLEEPING UNITS FROM OTHER OCCUPANCIES CONTIGUOUS TO THEM IN THE SAME BUILDING SHALL BE CONSTRUCTED AS HORIZONTAL ASSEMBLIES IN ACCORDANCE WITH SECTION 712.
CHAPTER 5 - BUILDING HEIGHT AND AREA / SEPARATION OF OCCUPANCIES:
BC 501.2 ADDRESS IDENTIFICATION: BUILDINGS SHALL BE PROVIDED WITH ADDRESS NUMBERS AND SHALL BE PLAINLY VISIBLE FROM THE STREET.
BC 501.3 FIRE DEPARTMENT ACCESS
BC 501.3.1 FRONTAGE
REQUIRED FRONTAGE > 8% OF BUILDING PERIMETER
FRONTAGE = 115'-4" PERIMETER = 341'-6"
FRONTAGE / PERIMETER = 115.'-4"/341'-6" = 34% PROVIDED => COMPLIES
BC 501.3.2 BUILDING ACCESS

BUILDING PROTECTED BY AUTOMATIC SPRINKLER SYSTEM
DIRECT ACCESS TO CELLAR PROVIDED WITHIN EACH 100 FT OR FRACTION THEREOF OF HORIZONTAL LENGTH OF EVERY WALL THAT FRONTS ON A STREET OR FRONTAGE SPACE - COMPLIES

BC 503 HEIGHT AND AREA LIMITATIONS:
BC TABLE 503 ALLOWABLE HEIGHT AND BUILDING AREAS:
IB CONSTRUCTION TYPE
USE M HEIGHT = UNLIMITED (PROTECTED WITH SPRINKLER SYSTEM) AREA = UNLIMITED
USE R-2 HEIGHT = UNLIMITED (PROTECTED BY SPRINKLER SYSTEM) AREA = UNLIMITED

BC 508.1 MIXED USE OCCUPANCY: EACH PORTION OF A BUILDING SHALL BE INDIVIDUALLY CLASSIFIED IN ACCORDANCE WITH SECTION 302.1.
BC 508.2 ACCESSORY OCCUPANCY: ACCESSORY OCCUPANCIES ARE THOSE OCCUPANCIES THAT ARE ANCILLARY TO THE MAIN OCCUPANCY OF THE BUILDING OR PORTION THEREOF. AGGREGATE ACCESSORY OCCUPANCY SHALL NOT OCCUPY MORE THAN 10 PERCENT OF THE BUILDING AREA OF THE STORY IN WHICH THEY ARE LOCATED.
508.4.4 REQUIRED SEPARATION OF OCCUPANCIES (AS PER BC TABLE 508.4):
M AND R-2 2 HOUR SEPARATION REQUIRED (OR 1HR W/SPRINKLERS) M AND S-2 2 HOUR SEPARATION REQUIRED (OR 1HR W/SPRINKLERS)
BC 509.2 INCIDENTAL USE AREAS AND OCCUPANCY CLASSIFICATION.
INCIDENTAL USES SHALL NOT BE INDIVIDUALLY CLASSIFIED IN ACCORDANCE WITH SECTION 302.1. INCIDENTAL USES SHALL BE INCLUDED IN THE BUILDING OCCUPANCIES WITHIN WHICH THEY ARE LOCATED. INCIDENTAL USES SHALL NOT OCCUPY MORE THAN 10% OF THE BUILDING IN WHICH THEY AREA LOCATED.
BC TABLE 509 INCIDENTAL USE AREAS AND SEPARATION REQUIREMENTS
FURNACE / BOILER ROOM: 1 HOUR REQUIRED (SPRINKLERED)
FIRE PUMP EQUIP. RM: 2 HOUR REQUIRED
WASTE COLLECTION RM > 100 S.F.: 1 HOUR REQUIRED
BC 510.10 SEPARATION OF TENANCIES:
DIFFERENT TENANCIES MUST BE SEPARATED BY FIRE BARRIERS HAVING A 1 HOUR FIRE RATING.

CHAPTER 6 - TYPE OF CONSTRUCTION
BC 602.2 CONSTRUCTION CLASSIFICATION: TYPE IB - NON-COMBUSTIBLE

CHAPTER 7 - FIRE RESISTANCE RATINGS
BC 703.2 FIRE RESISTANCE RATINGS:
MATERIALS USED IN THE CONSTRUCTION OF THE BUILDING SHALL COMPLY TO FIRE RESISTANCE REQUIREMENTS OF THE CODE AND IN PARTICULAR FOR THE FOLLOWING CONDITIONS:
NON SYMMETRICAL WALL CONSTRUCTION
COMBUSTIBLE COMPONENTS PERMITTED IN NONCOMBUSTIBLE CONSTRUCTION.
STRUCTURAL RESTRAINED CLASSIFICATION.

BC 703.3 METHODS OF DETERMINING FIRE RESISTANCE:
METHODS OF TESTING TO DETERMINE FIRE RESISTANCE MUST BE BASED ON ASTM E119 OR UL 263
THE FOLLOWING METHODS TO DETERMINE THE PERMITTED FIRE RESISTANCE OF A MATERIAL ARE PERMITTED BY THE CODE:
FIRE RESISTANCE DESIGNS DOCUMENTED IN APPROVED SOURCES
PRESCRIPTIVE DESIGNS OF FIRE RESISTIVE ELEMENTS AS PER BC SECTION 720.
CALCULATED DESIGN METHOD IN ACCORDANCE WITH BC SECTION 721.
ENGINEERING METHODS BASED ON ASTM E119 OR UL 263
ALTERNATIVE PROTECTION METHODS AS ALLOWED BY RULES OF THE DEPARTMENT

BC 704.2 COLUMN PROTECTION:
WHERE COLUMNS ARE REQUIRED TO BE FIRE-RESISTANCE RATED, THE ENTIRE COLUMN SHALL BE PROVIDED INDIVIDUAL ENCASEMENT PROTECTION BY PROTECTING IT ON ALL SIDES FOR THE FULL COLUMN LENGTH, INCLUDING CONNECTIONS TO OTHER STRUCTURAL MEMBERS, WITH MATERIALS HAVING THE REQUIRED FIRE RESISTANCE RATING. WHERE THE COLUMN EXTENDS THROUGH A CEILING, THE ENCASEMENT PROTECTION SHALL BE CONTINUOUS FROM THE TOP OF THE FOUNDATION OR FLOOR/CEILING ASSEMBLY BELOW THROUGH THE CEILING SPACE TO THE TOP OF THE COLUMN.
BC 705.8.2 PROTECTED OPENINGS
FIRE PROTECTIVE ASSEMBLIES NOT REQUIRED WHERE BUILDING IS EQUIPPED WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1.1 AND EXTERIOR OPENING IS PROTECTED WITH AN APPROVED WATER CURTAIN INSTALLED IN ACCORDANCE WITH NFPA 13, AS MODIFIED IN APPENDIX Q.
BC 706 FIRE WALLS (AS PER TABLE 706.4 FIRE WALL FIRE RESISTANCE RATINGS):
3 HOURS FOR BUILDINGS IN R2 + M OCCUPANCY GROUP
2 HOURS FOR BUILDING IN S-2

BC 707 FIRE BARRIERS:
BC 707.3 FIRE RESISTANCE RATINGS
BC 707.3.1 SHAFT ENCLOSURES: 2HR (PENETRATING 3 OR MORE STORIES) (708.4) 1HR (PENETRATING LESS THAN 3 STORIES)
BC 707.3.2 EXIT ENCLOSURE: 2 HOUR (1022.1)
BC 707.3.3 EXIT PASSAGEWAY: 2 HOUR (1023.3) BC 707.3.4 HORIZONTAL EXIT: N/A
BC 707.3.6 INCIDENTAL USE AREAS: SEE SECTION BC TABLE 508
BC 707.3.8 SEPARATION OF OCCUPANCIES: SEE SECTION BC 509.4

BC 708.4 FIRE RESISTANCE RATING
MECHANICAL SHAFTS: 2 HOUR.
BC 715 OPENING PROTECTIVES: (AS PER TABLE 715.4):
2 HOUR F.R. WALL - 1 1/2 HOUR FIRE DOOR ASSEMBLY
1 HOUR F.R. EXIT PASSAGE WAY OR ENCLOSURE - 1 HOUR FIRE DOOR ASSEMBLY
1 HOUR F.R. WALL - 3/4 HOUR FIRE DOOR ASSEMBLY.
BC 716.6.2 PENETRATIONS:
MEMBRANE PENETRATION SHALL BE PROTECTED BY APPROVED PENETRATION FIRESTOP
BC 708.12.1 SMOKE VENTING OF CLOSED SHAFTS
CLOSED SHAFT HAVING A FLOOR AREA OF 4 S.F. OR MORE SHALL BE PROVIDED WITH A SMOKE VENT. SMOKE VENT MAY BE CONSTRUCTED AS WINDOWS, LOUVERS OR VENT DUCTS. THEIR DIMENSION SHALL BE NO LESS THAN 3 1/2% OF THE SHAFT FLOOR AREA, BUT IN NO EVENT LESS THAN 72 SQ. INCHES.
SMOKE VENTS LOCATED ABOVE THE ROOF LINE SHALL BE LOCATED AT LEAST 8 INCHES ABOVE A NONCOMBUSTIBLE ROOF ASSEMBLY OR AT LEAST 36" ABOVE A COMBUSTIBLE ROOF ASSEMBLY. THE VENT SHALL BE LOCATED AT LEAST 10 FEET FROM ANY WINDOW, DOOR, EXTERIOR STAIRWAY, OR INTERIOR LOT LINE. THE VENT MAY BE LOCATED NO LESS THAN 5 FEET FROM ANY WINDOW OR DOOR PROVIDED THAT THE VENT IS LOCATED AT A POINT HIGHER THAN
THE TOP OF SUCH WINDOW OR DOOR. WHERE THE VENT IS CONSTRUCTED AS A WINDOW OR LOUVER, THE SILL OF THE WINDOW OR LOUVER SHALL BE LOCATED AT LEAST 36 INCHES ABOVE THE ROOF ASSEMBLY.
CHAPTER 8 - INTERIOR FINISHES
803.1.1.1 CLASSIFICATION
CLASS A: FLAME SPREAD 0-25
CLASS B: FLAME SPREAD 26-75
CLASS C: FLAME SPREAD 76-200
TABLE 803.1 INTERIOR FINISH REQUIREMENTS BY OCCUPANCY (SPRINKLERED BLDG)
R-2:
EXIT ENCLOSURES AND EXIT PASSAGEWAYS B
CORRIDORS B
ROOMS AND ENCLOSED SPACES C
M:
EXIT ENCLOSURES AND EXIT PASSAGEWAYS B
CORRIDORS B
ROOMS AND ENCLOSED SPACES B
S:
EXIT ENCLOSURES AND EXIT PASSAGEWAYS B
CORRIDORS C
ROOMS AND ENCLOSED SPACES C

CHAPTER 9 - FIRE PROTECTION SYSTEMS:
BUILDING IS FULLY SPRINKLERED, SEE FIRE PROTECTION DRAWINGS.
BC 907.2.9 FIRE ALARM: AN AUTOMATIC FIRE ALARM SYSTEM WITHOUT ALARM NOTIFICATION APPLIANCES AND SMOKE ALARMS IS REQUIRED ON AN R2 BUILDING WITH DWELLING UNITS LOCATED 3 OR MORE STORIES ABOVE THE LOWEST FLOOR OF EXIT DISCHARGE.
LOCATION OF SMOKE DETECTORS: REQUIRED IN ANY MECHANICAL OR ELECTRICAL ROOM, TELEPHONE, OR SIMILAR ROOM GREATER THAN 75SF, ELEVATOR MACHINE ROOM, AND ELEVATOR LOBBIES
BC 907.2.11.1 SMOKE ALARMS: REQUIRED ON CEILING OR WALL OUTSIDE OF EACH ROOM USED FOR SLEEPING, WITHIN 15 FEET FROM THE DOOR TO THE ROOM.
REQUIRED IN EACH ROOM USED FOR SLEEPING SMOKE ALARMS IN R-2 OCCUPANCY SHALL BE PROVIDED WITH THE CAPABILITY TO SUPPORT VISIBLE ALARM NOTIFICATION APPLIANCES IN ACCORDANCE WITH ICC/ANSI A117.1
OCCUPANCY CALCULATION:
ACCESSORY TO RESIDENTIAL (MECHANICAL AND SUPER'S ROOM)
CELLAR FLOOR: 1437/300 = 5 OCCUPANTS
MERCANTILE AREAS:
1 ST GROUND FLOOR 5731.45/30 = 191 OCCUPANTS
CELLAR (ACCESSORY TO M @ 1ST FLOOR) 5731.45/300 = 19 OCCUPANTS
TOTAL =210 OCCUPANTS.
RESIDENTIAL:
2ND FLOOR 4674.8/200 = 23 OCCUPANTS
3RD FLOOR 4674.8/200 = 23 OCCUPANTS
4TH FLOOR 4674.8/200 = 23 OCCUPANTS
5TH FLOOR 4674.8/200 = 23 OCCUPANTS
6TH FLOOR 4674.8/200 = 23 OCCUPANTS
PENTHOUSE 961.5/200 = 5 OCCUPANTS
TOTAL OCCUPANT LOAD FOR RESIDENTIAL =120 OCCUPANTS
TOTAL ACCESSORY TO RESIDENTIAL 5 OCCUPANTS
TOTAL MERCANTILE 210 OCCUPANTS
TOTAL RESIDENTIAL 120 OCCUPANTS
TOTAL 335
CHAPTER 10 - MEANS OF EGRESS:
FLOOR AREA PER OCCUPANT (AS PER TABLE 1004.1.1):
MERCANTILE AREAS: 30SF GROSS
RESIDENTIAL: 200 S.F. WITHIN DWELLING UNIT PER OCCUPANT
ACCESSORY STORAGE: 300 GROSS
BC 1005.1 EGRESS WIDTH PER OCCUPANTS SERVED STAIRWAYS: 0.3 INCHES OCCUPANT OTHER COMPONENTS: 0.2 INCHES
ACCESSIBLE MEANS OF EGRESS
1007.1 ACCESSIBLE MEANS OF EGRESS. 2 MEANS OF ACCESSIBLE EGRESS SHALL BE PROVIDED TO EACH ACCESSIBLE PORTION OF THE SPACE
1007.2 THE ACCESSIBLE MEANS OF EGRESS WILL INCLUDE:
INTERIOR ACCESSIBLE ROUTES, COMPLYING WITH SECTION 1104.
EXTERIOR EXIT STAIRWAYS COMPLYING WITH SECTIONS 1007.3 AND 1026.;
ELEVATORS COMPLYING WITH SECTION 1007.4.;
EXIT DISCHARGES COMPLYING WITH SECTION 1027.;
EXTERIOR ACCESSIBLE ROUTES COMPLYING WITH SECTION 1104.;
STAIRWAYS WILL HAVE RAILINGS ON BOTH SIDES.
1007.2.2 EXIT DISCHARGE. WHERE AN EXIT DISCHARGE IS NOT ACCESSIBLE, AN EXTERIOR AREA FOR ASSISTED RESCUE SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 1007.7. AN EXTERIOR AREA FOR ASSISTED RESCUE SHALL NOT BE REQUIRED WHERE AN EXIT DISCHARGE IS ON AN ASSISTED RESCUE PATH FROM A STAIRWAY OR AN ELEVATOR.
1007.3 EXIT STAIRWAYS.
TO BE CONSIDERED PART OF AN ACCESSIBLE MEANS OF EGRESS, AN EXIT ACCESS STAIRWAY AS PERMITTED BY SECTION 1016.1 OR EXIT STAIRWAY SHALL HAVE A CLEAR WIDTH OF 48 INCHES (1219 MM) MINIMUM BETWEEN HANDRAILS AND SHALL EITHER INCORPORATE AN AREA OF RESCUE ASSISTANCE WITHIN AN ENLARGED FLOOR-LEVEL LANDING OR SHALL BE ACCESSED FROM EITHER AN AREA OF RESCUE ASSISTANCE COMPLYING WITH SECTION 1007.6 OR A HORIZONTAL EXIT. UNENCLOSED EXIT STAIRWAYS AS PERMITTED BY SECTION 1022.1 ARE PERMITTED TO BE CONSIDERED PART OF AN ACCESSIBLE MEANS OF EGRESS.
EXCEPTIONS: THE FOLLOWING EXCEPTIONS APPLY TO THE REQUIREMENTS OF CLEAR WIDTH AND AREA OF RESCUE ASSISTANCE, AND DO NOT SUPERSEDE THE OTHER REQUIREMENTS OF THE ACCESSIBLE MEANS OF EGRESS:
1. THE AREA OF RESCUE ASSISTANCE IS NOT REQUIRED FOR OPEN EXIT ACCESS OR EXIT STAIRWAYS AS PERMITTED BY SECTIONS 1016.1 AND 1022.1 IN BUILDINGS THAT ARE EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM INSTALLED IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2.
2. THE CLEAR WIDTH OF 48 INCHES (1219 MM) BETWEEN HANDRAILS AND THE AREA OF RESCUE ASSISTANCE IS NOT REQUIRED AT EXIT ACCESS STAIRWAYS AS PERMITTED BY SECTION 1016.1 OR EXIT STAIRWAYS IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM INSTALLED IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2.
3. AREAS OF RESCUE ASSISTANCE ARE NOT REQUIRED AT EXIT STAIRWAYS IN BUILDINGS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM INSTALLED IN ACCORDANCE WITH SECTION 903.3.1.1 OR 903.3.1.2;
7. THE AREAS OF RESCUE ASSISTANCE ARE NOT REQUIRED IN GROUP R-2 OCCUPANCIES.

SECTION BC 1026. EXTERIOR EXIT RAMPS AND STAIRWAYS
1026.1 EXTERIOR EXIT RAMPS AND STAIRWAYS. EXTERIOR EXIT RAMPS AND STAIRWAYS SERVING AS AN ELEMENT OF A REQUIRED MEANS OF EGRESS SHALL COMPLY WITH THIS SECTION.
1026.2 USE IN A MEANS OF EGRESS. EXTERIOR EXIT STAIRWAYS SHALL NOT BE USED AS AN ELEMENT OF A REQUIRED MEANS OF EGRESS FOR GROUP I-2 OCCUPANCIES. FOR ALL OCCUPANCIES OTHER THAN GROUP I-2, EXTERIOR EXIT RAMPS AND STAIRWAYS SHALL BE PERMITTED AS AN ELEMENT OF A REQUIRED MEANS OF EGRESS FOR BUILDINGS NOT EXCEEDING SIX STORIES ABOVE GRADE PLANE OR HAVING OCCUPIED FLOORS MORE THAN 75 FEET (22 860 MM) ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT VEHICLE ACCESS.
1026.3 OPEN SIDE. EXTERIOR EXIT RAMPS AND STAIRWAYS SERVING AS AN ELEMENT OF A REQUIRED MEANS OF EGRESS SHALL BE OPEN ON AT LEAST ONE SIDE. AN OPEN SIDE SHALL HAVE A MINIMUM OF 35 SQUARE FEET (3.3 M2) OF AGGREGATE OPEN AREA ADJACENT TO EACH FLOOR LEVEL AND THE LEVEL OF EACH INTERMEDIATE LANDING.
THE REQUIRED OPEN AREA SHALL BE LOCATED NOT LESS THAN 42 INCHES (1067 MM) ABOVE THE ADJACENT FLOOR OR LANDING LEVEL.
1026.4 ADJOINING OPEN AREAS. THE OPEN AREAS ADJOINING EXTERIOR EXIT RAMPS OR STAIRWAYS SHALL BE EITHER YARDS, COURTS OR PUBLIC WAYS; THE REMAINING SIDES ARE PERMITTED TO BE ENCLOSED BY THE EXTERIOR WALLS OF THE BUILDING.
1026.5 LOCATION. EXTERIOR EXIT RAMPS AND STAIRWAYS SHALL BE LOCATED IN ACCORDANCE WITH SECTION 1027.3.

BC 1008.1.1.1 DOORS. DOORS PART OF AN ACCESS TO AN EXIT OR PART OF AN EXIT WILL MEASURE CLEAR WITH OF 32". MAXIMUM WIDTH OF A SWINGING DOOR LEAF IS 48"
BC 1008.1.1.3 HEIGHT OF DOORS SHALL NOT BE LESS THAN 80 INCHES. DOOR OPENINGS WITHIN A DWELLING UNIT SHALL NOT BE LESS THAN 78 INCHES IN HEIGHT. EXTERIOR DOOR OPENINGS IN DWELLING UNITS, OTHER THAN REQUIRED EXIT DOOR SHALL NOT BE LESS THAN 76 INCHES IN HEIGHT.
BC 1008.1.2.2 DOORS NEED NOT SWING IN THE DIRECTION OF EGRESS TRAVEL FOR EXTERIOR STREET FLOOR EXIT DOORS FROM LOBBIES SERVING ONLY GROUP R-2 OCCUPANCIES.
BC 1008.1.6 LANDING AT DOORS.LANDINGS SHALL HAVE A WIDTH NOT LESS THAN THE WIDTH OF THE STAIRWAY OR THE DOOR, WHICHEVER IS GREATER. DOORS IN THE FULLY OPEN POSITION SHALL NOT REDUCE A REQUIRED DIMENSION BY MORE THAN 7 INCHES. WHEN LANDING SERVES AN OCCUPANT LOAD OF LESS THAN 50, DOORS IN ANY POSITION CAN REDUCE THE LANDING 75 PERCENT OF ITS REQUIRED WIDTH. LANDINGS SHALL HAVE A LENGTHMEASURED IN THE DIRECTION OF TRAVEL OF NOT LESS THAN 44 INCHES.
BC 1009 STAIRWAYS:
BC 1009.1 STAIRWAY WIDTH: 36" WIDE STAIR IN R-2 OCCUPANCY IN BUILDING 125 FEET OR LESS IN HEIGHT, WITH 50 OCCUPANTS PER FLOOR.
BC 1009.2 HEADROOM. STAIRWAY HEADROOM IS 84" MINIMUM, EXCEPT THAT IN R-2 OCCUPANCIES THE MIN. HEADROOM PERMITTED IS 80".
BC 1009.4.2 STAIR TREADS AND RISERS
GENERAL RULE MAX RISER = 7" / MIN. TREAD = 11"
IN R-2 OCCUPANCY: MAX RISER = 7.75" / MIN TREAD = 9.5"
IN R-2 OCCUPANCY WITHIN DWELLING UNIT: MAX RISER = 8.25" MIN. TREAD = 9"
BC 1009.5 STAIRWAY LANDINGS. THE WIDTH OF LANDINGS SHALL NOT BE LESS THAN THE WIDTH OF STAIRWAYS THEY SERVE. EVERY LANDING SHALL HAVE A MINIMUM DIMENSION MEASURED IN THE DIRECTION OF TRAVEL EQUAL TO THE WIDTH OF THE STAIRWAY.
DOORS OPENING ONTO A LANDING SHALL NOT REDUCE THE LANDING TO LESS THAN 75 PERCENT OF THE REQUIRED WIDTH. WHEN FULLY OPEN, THE DOOR SHALL NOT PROJECT MORE THAN 7 INCHES INTO A LANDING.
BC 1009.12 HANDRAILS. TWO HANDRAILS ARE REQUIRED IN STAIRS THAT ALSO SERVE AS AN ACCESSIBLE MEANS OF EGRESS. ONE HANDRAIL IS REQUIRED IN STAIRS WITHIN DWELLING UNITS.
BC 1009.13 STAIRWAY TO ROOF. IN R2 BUILDINGS, 2 STORIES OR MORE IN HEIGHT, ALL STAIRS SHOULD EXTEND TO THE ROOF.

BC 1011 EXIT SIGNS. EXIT SIGNS ARE REQUIRED AT ALL EXITS AND EXIT ACCESS DOORS.
BC 1012.2 HANDRAIL. HANDRAIL HEIGHT SHALL NOT BE LESS THAN 34" AND NOT MORE THAN 38"
1013.2 GUARDRAILS. GUARDRAIL HEIGHT SHALL NOT BE LESS THAN 42"

1014.4.1 GROUP R-2 NONHIGH-RISE OCCUPANCIES. IN BUILDINGS IN OCCUPANCY GROUP R-2 NOT SUBJECT TO SECTION 403, A DOOR FROM A DWELLING UNIT SHALL OPEN INTO AN INTERVENING PUBLIC HALL. SUCH PUBLIC HALL SHALL BE CONSTRUCTED AS A PUBLIC CORRIDOR IN ACCORDANCE WITH SECTION 1018.
EXCEPTION 2: NO INTERVENING PUBLIC HALL SHALL BE REQUIRED WHERE THE DOORS OPENING TO THE APARTMENTS ARE SMOKE AND DRAFT CONTROLLED DOORS COMPLYING WITH UL 1784 WITHOUT ARTIFICIAL BOTTOM SEALS, IN ACCORDANCE WITH SECTION 715.3 AND 715.3.5.3 AND THE BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH SECTION 903.3.1. THIS EXCEPTION SHALL NOT APPLY TO ANY BUILDING THAT COMPLIES WITH ITEM 5 OF SECTION 1021.2 WHERE THERE IS MORE THAN ONE APARTMENT PER STORY.

BC 1015.2.1 (2) EXIT ACCESS DOORWAYS. WHERE A BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM, THE SEPARATION DISTANCE OF THE EXIT DOORS SHALL NOT BE LESS THAN 1/3 OF THE LENGTH OF THE MAXIMUM OVERALL DIAGONAL DIMENSION OF THE AREA SERVED.
BC 1016 EXIT TRAVEL DISTANCE. BC TABLE 1016.1
M OCCUPANCY TRAVEL DISTANCE = 200 FEET (SPRINKLERED)
R-2 OCCUPANCY TRAVEL DISTANCE = 200 FEET (SPRINKLERED)
S-2 OCCUPANCY TRAVEL DISTANCE = 200 FEET WITHOUT SPRINKLER, 250 WITH SPRINKLER
BC 1018.1.2 PUBLIC CORRIDORS. FOR M & R-2, CORRIDORS ARE REQUIRED TO BE 1 HOUR FIRE RESISTANT (NON COMBUSTIBLE)
BC 1018.2 CORRIDOR WIDTH. THE MINIMUM CORRIDOR WIDTH SHALL BE AS FOLLOWS:
24 INCHES: FOR ACCESS TO AND UTILIZATION OF MEP SYSTEMS OR EQUIPMENT 36 INCHES: WITH A REQUIRED OCC. CAPACITY OF 50 OR LESS, EXCEPT OTHERWISE REQ'D BY CHAPTER 11
30 INCHES: WITHIN A DWELLING UNIT IN OCC. GROUPS R2 EXCEPT AS OTHERWISE REQ'D BY SEC 1107
BC 1018.4 DEAD ENDS.WHERE MORE THAN ONE EXIT IS REQUIRED, THE EXIT ACCESS SHALL BE ARRANGED SUCH THAT THERE ARE NO DEAD END CORRIDORS MORE THAN 20 FEET IN LENGTH.
IN R-2 OCCUPANCIES, THE DEAD END IN A CORRIDOR SHALL NOT EXCEED 40 FEET. WITH 2HR FIRE RATING, LENGTH OF DEAD END CORRIDOR SHALL NOT EXCEED 60 FEET.
IN M OCCUPANCIES, WHERE THE BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM, THE LENGTH OF DEAD-END CORRIDORS SHALL NOT EXCEED 50 FEET.
BC 1019.2 EGRESS BALCONIES. BALCONIES USED FOR EGRESS PURPOSES SHALL CONFORM TO THE SAME REQUIREMENTS AS CORRIDORS FOR WIDTH, HEADROOM, DEAD ENDS AND PROJECTIONS. EXTERIOR BALCONIES SHALL BE DESIGNED TO MINIMIZE ACCUMULATION
OF SNOW OR ICE THAT IMPEDES THE MEANS OF EGRESS.
BC 1019.2 WALL SEPARATION. WALL SEPARATION IS NOT REQUIRED WHERE THE EXTERIOR EGRESS BALCONY IS SERVED BY AT LEAST TWO STAIRS AND A DEAD-END TRAVEL CONDITION DOES NOT REQUIRE TRAVEL PAST AN UNPROTECTED OPENING TO REACH A STAIR.
BC 1019.4 OPENNESS. THE LONG SIDE OF AN EGRESS BALCONY SHALL BE AT LEAST 50% OPEN, AND THE OPEN AREA ABOVE THE GUARDS SHALL BE SO DISTRIBUTED AS TO MINIMIZE THE ACCUMULATION OF SMOKE OR TOXIC GASES
1021.1 MINIMUM NUMBER OF EXITS: AS PER TABLE 1021.1 OCCUPANT LOAD OF 1-500 SHALL HAVE MINIMUM OF 2 EXITS
CHAPTER 11 - ACCESSIBILITY
BC 1101.2 DESIGN. BUILDINGS WILL BE DESIGNED IN ACCORDANCE WITH ICC A117.1
BC 1104 ACCESSIBLE ROUTES. ACCESSIBLE ROUTE WILL BE PROVIDED TO THE BUILDING ENTRANCE FROM THE STREET.
BC 1104.4 MULTILEVEL BUILDINGS. LEVELS THAT DO NOT CONTAIN ACCESSIBLE ELEMENTS ARE NOT REQUIRED TO BE SERVED BY AN ACCESSIBLE ROUTE FROM AN ACCESSIBLE LEVEL.
BC 1105 ACCESSIBLE ENTRANCES. BUILDING ENTRANCES WILL BE ACCESSIBLE.
BC 1105.6.1 ENTRANCES TO B UNITS SHALL COMPLY WITH SECT 1003.5 OF ICC A117.1

BC 1107 DWELLING UNITS
BC 1107.3 ACCESSIBLE SPACES. ROOMS AND SPACES AVAILABLE TO THE GENERAL PUBLIC OR AVAILABLE FOR USE BY RESIDENTS OF ACCESSIBLE UNITS HALL BE ACCESSIBLE. ACCESSIBLE SPACES SHALL INCLUDE, BUT NOT BE LIMITED TO SPACES FOR RESIDENTS' USE, SUCH AS REFUSE DISPOSAL AND STORAGE LOCATIONS, MAILBOX AREAS, RECREATIONAL FACILITIES, STORAGE ROOMS, PARKING AREAS, AND ANY EXTERIOR SPACES INCLUDING BALCONIES.
BC 1107.2.5 TYPE B NYC MULTISTORY UNITS. FUNCTIONAL FACILITIES IN COMPLIANCE WITH SECTION 1107.2 NEED NOT BE LOCATED ON THE PRIMARY ENTRY STORY, BUT MAY BE LOCATED ON ANY STORY WITHIN THE DWELLING UNIT PROVIDED THAT ALL ROOMS, SPACES, AND DOORS LOCATED ON SUCH STORY CONTAINING SUCH FUNCTIONAL FACILITIES COMPLY WITH SECTION 1107.2.
AT LEAST ONE TOILET ROOM COMPLYING WITH SECTION 1107.2.2 SHALL BE PROVIDED ON THE PRIMARY ENTRY STORY. IN ADDITION, AN ACCESSIBLE EXTERNAL ELEVATOR IS PROVIDED TO CONNECT ALL SUCH STORIES OF THE MULTISTORY DWELLING UNIT.

CHAPTER 12 - INTERIOR ENVIRONMENT.
BC 1203.4 NATURAL VENTILATION.
BC 1203.4.1.2 MINIMUM OPENING. THE MINIMUM OPERABLE AREA TO THE OUTDOOR SHALL BE 5% OF THE HABITABLE ROOM TO BE VENTILATED.
BC 1205.2.1 LIGHTING. MINIMUM OPENING OF GLAZED AREA TO BE NO LESS THAN 10% OF THE ROOM FLOOR AREA.
BC 1207 SOUND TRANSMISSION
BC 1207.2 AIRBORNE SOUND. WALLS, PARTITIONS AND FLOOR/CEILING ASSEMBLIES SEPARATING DWELLING UNITS FROM EACH OTHER, AND /OR FROM PUBLIC AND SERVICE AREAS, FROM STAIR, OR FROM ELEVATORS, OR FROM OTHER MECHANICAL ROOMS AND SHAFTS, SHALL HAVE AN AIR STC CLASS FOR AIR-BORNE NOISES OF NOT LESS THAN 50, BASED UPON LAB TESTS, AND OF NOT LESS THAN 45 IF FIELD TESTED.
DWELLING UNIT ENTRANCE DOOR ASSEMBLIES SHALL HAVE AN STC RATING OF NOT LESS THAN 30.
BC 1207.3 STRUCTURE-BORNE SOUND. FLOOR/CEILING ASSEMBLIES SHALL HAVE AN IIC (IMPACT/INSULATION CLASS) RATING OF NOT LESS THAN 50 IF MEASURED IN A LAB, AND NOT LESS THAN 45 IF FIELD TESTED.

TABLE 706.4
FIRE WALL FIRE-RESISTANCE RATINGS

GROUP	FIRE-RESISTANCE RATING (hours)
A, B, E, H-4, I, R-1, (R-2), U	(3ᵃ)
F-1, H-3ᵇ, H-5, (M), (S-1)	(3)
H-1, H-2	4ᵇ
F-2, S-2, R-3	2

a. Walls shall be not less than 2-hour fire-resistance rated where separating buildings of Type II or V construction.
b. For Group H-1, H-2 or H-3 buildings, also see Sections 415.4 and 415.5.

TABLE 1018.1.2
PUBLIC CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	REQUIRED FIRE-RESISTANCE RATING (hours)
H-1, H-2, H-3	2
H-4, H-5	1
A, E, F, (M), S, U	(1)
B	1ᵃ
(R (Noncombustible))	(1)
R (Combustible)	2ᵃ
I-1, I-2, I-3, I-4	1

TABLE 1018.1.1
INTERIOR CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	OCCUPANT LOAD SERVED BY INTERIOR CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours) Without sprinkler system	With sprinkler systemᶜ
H-1, H-2, H-3	All	Not Permitted	1
H-4, H-5	Greater than 30	Not Permitted	1
A, B, E, F, M, S, U	Greater than 30	1	0
R	Greater than 10	1ᵈ	0
I-2ᵃ, I-4	All	Not Permitted	0
I-1, I-3	All	Not Permitted	1ᵇ

a. For requirements for occupancies in Group I-2, see Sections 407.2 and 407.3.
b. For a reduction in the fire-resistance rating for occupancies in Group I-3, see Section 408.8.
c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 where allowed.
d. Interior corridors within dwelling or sleeping units in Group R occupancies pursuant to Section 1018.1.1, Exception 2 shall not require fire-resistance rating.

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (hours)

BUILDING ELEMENT	TYPE I A	TYPE I B	TYPE II Aᵉ	TYPE II B	TYPE III Aᵉ	TYPE III B	TYPE IV HT	TYPE V Aᵉ	TYPE V B
Primary structural frameᵃ ᵇ (see Section 202)	3ᵇ	2ᵇ	1	0	1	0	HT	1	0
Bearing walls Exteriorᶠ ᵍ	3	2	1	0	2	2	2	1	0
Bearing walls Interior	3ᵇ	2ᵇ	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interiorᵈ	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor construction‡ and secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and secondary members (see Section 202)‡	1½ᵇ ᶜ	1ᵇ ᶜ	1ᵇ ᶜ	0ᶜ ‡	1ᵇ ᶜ	0	HT	1ᵇ ᶜ	0

TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCEᵃ ᵈ ᵍ ʰ

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP Hᶠ	OCCUPANCY GROUP F-1, [M], S-1ᵉ	OCCUPANCY GROUP A, B, E, F-2, I, [R], S-2, Uᵇ
X < 5ᶜ	All	3	[2]	[1]
5 ≤ X < 10	IA	3	2	1
	Others	2	1	1
10 ≤ X < 30	IA, IB	2	1	1ᵈ
	IIB, VB	1	0	0
	Others	1	1	1ᵈ
X ≥ 30	All	0	0	0

For SI: 1 foot = 304.8 mm.
a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
b. Group U when used as accessory to Group R-3 shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet or more for free standing private garages in compliance with Section 406.1, and when the separation distance is 3 feet or more for other freestanding Group U buildings. For free standing private garages where the fire separation distance is less than 5 feet, refer to Section 406.1 for required fire-resistance rating for exterior walls.
c. See Section 706.1.1 for party walls.
d. Open parking garages complying with Section 406 shall not be required to have a fire resistance rating.
e. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.
f. For special requirements for Group H occupancies, see Section 415.3.
g. Inside the fire district, exterior load-bearing walls of Type II buildings shall have a fire-resistance rating not less than prescribed below:

X < 5	2 hours
5 ≤ X < 10	2 hours
10 ≤ X < 30	1 hour
X ≥ 30	As per table 602.

h. Inside the fire district, exterior nonload-bearing walls of Type II buildings shall have a fire-resistance rating not less than prescribed below:

X < 5	As per Table 602
5 ≤ X < 10	As per Table 602
10 ≤ X < 30	1 hour
X ≥ 30	As per Table 602

ARCHITECT/ENGENEER SHALL NOT HAVE CONTROL, CHARGE OF AND NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, DEVIATIONS, TECHNIQUES, SEQUENCES, PROCEDURES, SAFETY PRECAUTIONS AND/OR PROGRAMS IN CONNECTION WITH THE WORK, ACTS, OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS OR ANY OTHER PERSON PERFORMING ANY OF THE WORK, AND/OR FOR FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO HIRE PRIOR TO COMMENCEMENT OF ANY WORK AN INDEPENDENT ARCHITECT/ ENGINEER TO PERFORM CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE NYC BUILDING CODE. THE ARCHITECT / ENGINEER PERFORMING THE CONTROL INSPECTIONS SHALL INSPECT THE SITE TO INSURE THE SAFETY OF THE SITE, QUALITY OF WORK, COMPLIANCE TO NYC BUILDING CODE, ZONING RESOLUTION, AND / OR ANY APPLICABLE CODE IN ACCORDANCE WITH CONTRACT DOCUMENTS. THE ARCHITECT/ENGINEER, PERFORMING CONTROL INSPECTIONS SHALL SUBMIT THE CONTROL INSPECTIONS, PROGRESS REPORT AND ALL FINDINGS OF THE WORKSITE TO THE DEPARTMENT OF BUILDINGS.

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SEAL

Accepted For OPPN #1/04
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COMPLIANCE
PAGE

DWG No
G-001.00

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Scan Code ESHS8345475

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THE IMPLEMENTATION OF THESE DRAWINGS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BRING TO ARCHITECT'S ATTENTION IN WRITING ANY DISCREPANCIES IN THESE PLANS. THE CONTRACTOR SHALL SUBMIT TO ARCHITECT FOR APPROVAL ALL SHOP DRAWINGS AND SPECIFICATIONS RELATED TO THIS PROJECT.

GENERAL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE TO FAMILIARIZE HIMSELF THOROUGHLY WITH ALL DRAWINGS, SPECIFICATIONS, FIELD CONDITIONS AND OTHER REQUIREMENTS OF THIS PROJECT AND SHALL REPORT ANY DISCREPANCIES TO THE ARCHITECT.

2. THE DRAWINGS REFLECT CONDITIONS REASONABLY INTERPRETED FROM THE EXISTING VISIBLE CONDITIONS OR FROM DRAWINGS OR INFORMATION FURNISHED BY THE OWNER BUT CANNOT BE GUARANTEED BY THE ARCHITECT.

3. ALL CONSTRUCTION SHALL COMPLY WITH STATE AND OTHER LOCAL BUILDING CODES AND REGULATIONS AND THE BEST TRADE PRACTICES.

4. THE CONTRACTOR SHALL PROVIDE SUCH LABOR, MATERIALS AND EQUIPMENT AS REQUIRED FOR THE TIMELY COMPLETION OF HIS WORK, AND TO COMPLETE THE PROJECT AS SHOWN.

5. MINOR DETAILS NOT USUALLY SHOWN OR SPECIFIED, BUT NECESSARY FOR THE PROPER CONSTRUCTION, INSTALLATION OR OPERATION OR ANY PART OF THE WORK AS DETERMINED BY THE ARCHITECT SHALL BE INCLUDED IN THE WORK AS IF IT WERE SPECIFIED OR INDICATED IN THE DRAWINGS.

6. ALL MATERIALS SHALL BE INSTALLED PROPERLY, FOR THE USE INTENDED, IN ACCORDANCE WITH THE MANUFACTURERS WRITTEN INSTRUCTIONS AND TO THE HIGHEST STANDARDS OF THE TRADE.

7. THE CONTRACTOR SHALL FILE FOR ALL PERMITS CONTROLLED INSPECTIONS, INSPECTIONS AND SIGN-OFFS, PAY ALL RELATED FEES AND PRESENT COPIES OF APPROVALS FOR FINAL ACCEPTANCE BY THE OWNER INCLUDING FINAL CERTIFICATE OF OCCUPANCY.

8. THE DRAWINGS ARE NOT TO BE SCALED, ONLY DIMENSIONS ARE TO BE USED. ALL DIMENSIONAL DISCREPANCIES SHALL BE CALLED TO THE ARCHITECTS ATTENTION. All DIMENSIONS SHALL BE VERIFIED BEFORE STARTING WORK BY THE RESPECTIVE SUBCONTRACTOR, WHO SHALL BE HELD RESPONSIBLE FOR HIS PHASE OF THE WORK. VERIFIED EXISTING FRAMING, REVIEW WITH ARCHITECT ALL EXPOSED CONDITIONS WHERE NEW CONSTRUCTION IS SUPPORTED BY EXISTING CONSTRUCTION.

9. ALL CONSTRUCTION, DIMENSIONS AND DETAILS SHALL CONCUR WITH AND BE DETERMINED FROM THESE DRAWINGS AND REVISED DRAWINGS OR SKETCHES ISSUED BY THE ARCHITECT ONLY.

10. DIMENSIONS ON PLAN SHOWN AS PLUS OR MINUS (+,-) ARE TO BE CLARIFIED IN THE FIELD AND DISCREPANCIES OF GREATER THAN 2" ARE TO REPORTED TO THE ARCHITECT.

11. ALL MATERIALS, ASSEMBLIES, FORMS AND METHODS OF CONSTRUCTION AND SERVICE EQUIPMENT SHALL MEET WITH THE FOLLOWING REQUIREMENTS:
   A. SHALL BE ACCEPTABLE PRIOR TO THE EFFECTIVE DATE OR THE N.Y.C. BUILDING CODE OR,
   B. SHALL BE ACCEPTED FOR USE UNDER THE PRESCRIBED CODE TEST METHOD BY COMMISSIONER OR,
   C. HAVE BOARD OF STANDARDS AND APPEALS APPROVAL.

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY SERVICES AND UTILITIES DURING THE CONSTRUCTION PERIOD, AND SHALL PAY ALL COST INVOLVED.

13. THE CONTRACTOR SHALL CARRY BUILDERS RISK INSURANCE WITH BROAD FORM EXTENDED COVERAGE COVERING THE VALUE OF HIS COMPLETED WORK.

14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY PROTECTION, SECURITY AND SAFETY OF THE SITE DURING CONSTRUCTION.

15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATELY BRACING AND PROTECTING ALL WORK DURING CONSTRUCTION AGAINST DAMAGE BREAKAGE, COLLAPSE, DISTORTION AND MISALIGNMENT ACCORDING TO APPLICABLE CODE STANDARDS AND GOOD PRACTICE.

16. THE CONTRACTOR SHALL PROVIDE A REFUSE CONTAINER AT THE SITE AND SHALL CLEAN UP HIS DEBRIS AT THE TIME OF COMPLETION OF EACH WORK DAY.

17. ALL CONSTRUCTION SHALL BE AS PER PLANS AND SPECIFICATIONS UNLESS OTHERWISE AGREED IN WRITING BY THE OWNER.

18. NO CHANGES ARE TO BE MADE WITHOUT THE CONSULTATION AND APPROVAL BY THE ARCHITECT.

19. ARCHITECT HAS NOT BEEN RETAINED TO SUPERVISE ANY CONSTRUCTION OR INSTALLATION OF ANY EQUIPMENT AT BUILDING SITE.

20. CONTRACTOR SHALL BE RESPONSIBLE TO **THE OWNER FOR ALL ACTS AND OMISSIONS OF HIS EMPLOYEES, AND ALL SUB-CONTRACTORS, THEIR AGENTS AND EMPLOYEES AND ALL OTHER PERSONS PERFORMING ANY OF THE WORK TO BE DONE.**

21. IT IS THE INTENTION OF THIS CONTRACT TO COMPLETELY FINISH AND READY FOR OCCUPANCY THIS BUILDING IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND ALL REQUIREMENTS OF LAWS... ALTHOUGH NECESSARY WORK MAY NOT BE ITEMIZED IN THE DRAWINGS THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE EXISTING CONDITIONS AND INCLUDE ALL WORK SPECIFIED OF IMPLIED FOR THE COMPLETE REPAIR OF THIS BUILDING.

CONSTRUCTION NOTES

1. PROVIDE FLASHING AT HEADS AND SILLS OF ALL WINDOWS AND EXTERIOR DOOR OPENINGS.

2. STEEL LINTELS OVER 4'-0" SUPPORTING MASONRY SHALL BE FIREPROOFED WITH WIRE LATH AND 1" VERMICULITE PLASTER OR CEMENT PLASTER.

3. PLUMBING FIXTURES: WATER CLOSET - VITREOUS CHINA WITH MAX. 1 3/5 GAL. FLUSH, WITH AN APPROVED VACUUM BREAKER. ALL FIXTURES TO MEET WATER SAVING PERFORMANCE STANDARDS. (L.L. 29-89) FIXTURES TO BE AS SELECTED BY THE OWNER AND/OR CONTRACTOR.

4. ELECTRICAL: ALL WIRING TO COMPLY WITH THE MINIMUM REQUIREMENTS OF THE NEW YORK CITY ELECTRICAL CODE. LOCATION OF ALL OUTLETS, SWITCHES, RECEPTACLES, CEILING LIGHTS, BELL SYSTEM, AS DIRECTED BY THE OWNER AND/OR CONTRACTOR.

5. HEATING SYSTEM TO BE CAPABLE OF MAINTAINING A MINIMUM TEMPERATURES PER CHAPTER 13 OF 2008 NYC B.CODE AND SHALL ALSO MEET THE REQUIREMENTS OF THE NEW YORK STATE ENERGY CONSERVATION CONSTRUCTION CODE, THE MORE STRINGENT SHALL APPLY.

6. MECHANICAL VENTILATION: BATHROOMS WHICH ARE TO BE MECHANICALLY VENTILATED SHALL BE PROVIDED WITH AT LEAST 50 C.F.M. EXHAUST. VENT SHAFT TO GO 3'-0" ABOVE ROOF.

7. STAIRS TO HAVE A MAXIMUM RISER HEIGHT OF 7.5", TREAD TO BE A MINIMUM OF 9 1/5" PLUS NOSING. THE SUM OF TWO RISERS PLUS TREAD (EXCLUSIVE OF NOSING) SHALL BE NOT LESS THAN 24" NOR MORE THAN 25-1/2". INTERIOR STAIRS SHALL COMPLY WITH CHAPTER 10 OF 2008 NYC B. CODE.

8. A FINAL SURVEY WILL BE FILED TO COMPLY WITH 2008 NYC B. CODE

9. LOT GRADING TO BE REGULATED AS FOLLOWS: WHEN PITCH OF LOT DOES NOT EXCEED 5% ALL UNPAVED AREAS TO BE SEEDED. WHEN PITCH OF LOT EXCEEDS 5%, ALL UNPAVED AREAS TO BE SODDED. THIS GRADING WILL BE DESIGNED SO AS NOT TO RESULT IN PONDING OR UNSTABLE GRADES IN THE SURROUNDING AREA.

10. INTERIOR FINISHES SHALL CONFORM TO CHAPTER 8 OF 2008 NYC BUILDING CODE.

11. SMOKE DETECTORS TO BE PROVIDED WHERE INDICATED ON PLANS.

HOUSING MAINTENANCE CODE # MULTIPLE DWELLING NOTES

A. PAINTING - (SEC. 29 M.D.L. AND ART. 12 H.M.C)
   1. PAINTING OF PUBLIC PARTS AND WITHIN DWELLINGS SHALL COMPLY WITH SEC. D26-12.01 H.M.C.
   2. PAINTING OF WINDOW FRAMES SHALL COMPLY WITH SEC. D26-12.03 H.M.C.
   3. WALLS OF COURTS AND SHAFTS SHALL BE OF A LIGHT COLORED SURFACE.

B. EXTERMINATION AND RAT PROOFING - (SEC 80 M.D.L. AND ART. 13 H.M.C.)
   1. DWELLINGS SHALL BE SO CONSTRUCTED AS TO BE RAT-PROOF.
   2. PREMISES SHALL BE MAINTAINED AND KEPT FREE OF RODENT AND INSECT INFESTATION.

C. RECEPTACLES FOR AND COLLECTION OF WASTE MATTER - (SEC. 81 M.D.L. AND ART 14 H.M.C.)
   1. PROPER AND SUITABLE CONVENIENCES OR RECEPTACLES SHALL BE PROVIDED FOR COLLECTION OF WASTE MATTER.

D. PLUMBING AND DRAINAGE - (SEC. 77 M.D.L. AND ART 16 H.M.C.)
   1. ENTIRE PLUMBING AND DRAINAGE SYSTEM INCLUDING ALL PLUMBING FIXTURES SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD REPAIR AT ALL TIMES.
   2. ALL ROOFS, TERRACES, SHAFTS, COURTS, AREAS AND YARDS SHALL BY PROPERLY GRADED AND DRAINED (SEE SITE PLAN)

E. HEAT AND HOT WATER - (SEC. 79 M.D.L. AND ART. 17 H.M.C.)
   1. YEARLY INSPECTIONS OF CENTRAL HEATING PLANTS SHALL BE MADE BY A QUALIFIED PERSON.
   2. MINIMUM TEMPERATURES FOR HEATING AND HOT WATER SHALL BE MAINTAINED.

F. GAS METERS AND GAS APPLIANCES - (SEC. 64 M.D.L. AND ART. 18 H.M.C.)
   1. GAS METERS SHALL COMPLY WITH SEC. 64 M.D.L.
   2. GAS APPLIANCES SHALL, IN ADDITION TO THESE SECTIONS, COMPLY WITH THE BOARD OF STANDARDS AND APPEALS.
   3. YEARLY INSPECTION OF GAS APPLIANCES BY QUALIFIED PERSON SHALL BE MADE IN "OLD LAW TENEMENTS" OR "ROOMING UNITS".

G. ARTIFICIAL LIGHTING AND ENTRANCE DOORS - (SEC. 26 # 35 M.D.L. AND ART. 19 H.M.C.)
   1. PROPER ELECTRIC LIGHTING AND EQUIPMENT SHALL BE PROVIDED AND MAINTAINED WITHIN ALL DWELLINGS.
   2. PROPER ELECTRIC LIGHTS SHALL BE INSTALLED AND MAINTAINED AT OR NEAR THE OUTSIDE OF FRONT ENTRANCE WAY AND MIN. OR 50 WATTS INCANDESCENT ILLUMINATION OR EQUIVALENT AND MIN. OR 40 WATTS IN YARDS AND COURTS AND SHALL BE KEPT BURNING FROM SUNSET EACH DAY TO SUNRISE ON THE DAY FOLLOWING.
   3. MAIN ENTRANCE AND VESTIBULE DOORS SHALL HAVE NOT LESS THAN FIVE (5)SQ.FT. OF GLAZED SURFACE.

H. ENTRANCE DOORS - (SEC. 50-A.M.D.L. AND ART. 20 H.M.C.)
   1. BLDG. ENTRANCES AND ALL OTHER EXTERIOR ENTRANCES SHALL BE EQUIPPED WITH APPROVED TYPE AUTOMATIC SELF-CLOSING AND SELF-LOCKING DOORS.
   2. ENTRANCE DOORS TO EACH DWELLING UNIT SHALL HAVE KEY LOCK WITH AT LEAST ONE KEY TO BE PROVIDED BY OWNER, HEAVY DUTY LATCH SET WITH DEAD BOLT, THUMB TURN INSIDE AND DOOR CHAIN GUARD, STC 35.

J. PEEP HOLES - (SEC. 51-A.M.D.L. AND ART. 20 H.M.C.)
   1. PEEPHOLES SHALL BE PROVIDED IN ENTRANCE DOORS OR EACH DWELLING UNIT, LOCATED AS PRESCRIBED BY THE DEPARTMENT.

K. BELLS AND MAIL SERVICE - (SEC. 57 M.D.L. AND ART. 21 H.M.C.)
   1. BELL OR BUZZER SYSTEM SHALL BE APPROVED TYPE AND SHALL BE KEPT IN ORDER.
   2. PROVIDE AND MAINTAIN APPROVED TYPE MAIL RECEPTACLES AND DIRECTORIES OF PERSONS LIVING IN THE DWELLING AS PROVIDED BY FEDERAL LAW AND AS PER REGULATIONS OF THE POST OFFICE DEPARTMENT.

L. LIGHTING AND VENTILATION - (SEC. 30 M.D.L. AND ART. 30 H.M.C.)
   1. WINDOWS IN ALL ROOMS, EXCEPT BATHROOM AND KITCHENETTES, SHALL BE AT LEAST ONE-TENTH THE AREA OF THE ROOM AND BE AT LEAST 12 SQ.FT. IN AREA

M. WATER CLOSET AND BATH ACCOMMODATIONS - (SEC. 76 M.D.L. AND ART.31 H.M.C.)
   1. FLOORS SHALL BE CERAMIC TILE WITH 6" BASE.
   2. WALLS AND FLOORS IN WATER CLOSET COMPARTMENT, BATHROOMS AND LAVATORIES SHALL COMPLY WITH REQUIREMENTS OF THESE SECTIONS.
   3. EVERY WATER CLOSET COMPARTMENT, BATHROOM AND LAVATORY SHALL HAVE A WINDOW OF AT LEAST 3 SQ.FT. IN AREA AND ONE HALF THE AREA SHALL OPEN.
   4. IN LIEU OF A WINDOW, MECHANICAL VENTILATION MAY BE INSTALLED WHICH WILL PROVIDE AT LEAST FOUR CHANGES OF AIR PER HR. OR A MIN. OF 50 CFM OF EXHAUST FOR EACH SUCH WATER CLOSET COMPARTMENT, BATHROOM OR LAVATORY AND SHALL BE PROVIDED WITH APPROVED TYPE REGISTER WITH FUSIBLE LINK DAMPER B.S.# A. CAL. # 678.41-SM.

O. KITCHENS AND KITCHENETTES - (SEC. 33 M.D.L. AND ART. 32 H.M.C.)
   1. EVERY KITCHEN AND KITCHENETTE SHALL BE PROVIDED WITH FACILITIES FOR COOKING AND SHALL BE EQUIPPED FOR ARTIFICIAL LIGHTING.
   2. EVERY KITCHEN AND KITCHENETTE SHALL BE PROVIDED WITH A SINK HAVING A MIN. 2" WASTE AND TRAP.
   3. LIGHTING AND VENTILATION OF KITCHENS SHALL BE AS PROVIDED UNDER SEC.30 M.D.L. AND ART. 30 H.M.C.
   4. CEILING AND WALLS, EXCLUSIVE OF DOORS, OF ALL KITCHENETTES SHALL BE FIRE RETARDED WITH MATERIALS HAVING A ONE HR. FIRE RATING OR IN LIEU THEREOF SHALL BE EQUIPPED WITH A SPRINKLER.
   5. KITCHENETTES SHALL BE PROVIDED WITH A WINDOW AT LEAST ONE FT. WIDE 3 SQ. FT... IN AREA AND BE AT LEAST 10% OF THE FL. AREA IN LIEU OF WINDOW MECHANICAL VENTILATION MAY BE INSTALLED WHICH WILL PROVIDE. AT LEAST 6 CHANGES OF AIR PER HOUR.
   6. ALL COMBUSTIBLE MATERIALS IMMEDIATELY UNDERNEATH AND WITHIN ONE FOOT OF COOKING APPARATUS SHALL BE PROPERLY FIRE RETARDED. A MINIMUM OF TWO FEET CLEARANCE SHALL BE MAINTAINED ABOVE EXPOSED COOKING SURFACES. COMBUSTIBLE MATERIALS BETWEEN 2 AND 3 FEET ABOVE EXPOSED COOKING SURFACE SHALL BE FIRE RETARDED.

P. BOILER ROOMS - (SEC. 65 M.D.L.)
   1. BOILER ROOMS SHALL COMPLY WITH REQUIREMENTS OF THIS SECTION.

R. SECURITY REQUIREMENTS (604.4)
   1. BLDG. 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.
   2. DOORS TO DWELLING UNITS SHALL BE EQUIPPED WITH A HEAVY DUTY LOCKSET; A DEAD BOLT WITH INTERIOR THUMB TURN AND A CHAIN DOOR GUARD.
   3. ALL OPENABLE WINDOWS SHALL BE EQUIPPED WITH SASH LOCKS DESIGNED TO BE OPENABLE FROM THE INSIDE ONLY.
   4. BLDGS. CLASSIFIED IN OCCUPANCY GROUP J-2 CONTAINING 8 OR MORE DWELLING UNITS SHALL BE PROVIDED WITH AN INTERCOMMUNICATION SYSTEM LOCATED AT THE DOOR GIVING ACCESS TO THE MAIN ENTRANCE HALL OR LOBBY.

S. MISCELLANEOUS NOTES:
   1. RADIATORS SHALL NOT OBSTRUCT STAIRS OR PUBLIC HALLS.
   2. ALL F.P.S.C. DOORS AND TRIM SHALL HAVE FIRE RATING AS SPECIFIED ON PLAN OR DOOR SCHEDULE.
   3. CARPENTER SHALL PROVIDE RECESS FOR MEDICINE CABINETS IN BATHROOMS AND LAVATORIES.
   4. ALL BATHTUBS, RECESSED OR OTHERWISE, SHALL BE PROVIDED WITH SUFFICIENT SHOWER CURTAIN RODS.
   5. PROVIDE AND SET WOOD SHELVES AND A 1-1/2" DIAMETER HORIZONTAL WOOD OR METAL POLE IN EACH CLOSET. LINEN CLOSETS SHALL HAVE FIVE SHELVES.

EARTHQUAKE LOADS

1614.1 SCOPE. EVERY STRUCTURE, AND PORTION THEREOF, SHALL AT A MINIMUM, BE DESIGNED AND CONSTRUCTED TO RESIST THE EFFECTS OF EARTHQUAKE MOTIONS AND ASSIGNED A SEISMIC DESIGN CATEGORY AS SET FORTH IN SECTION 1616.3.

EXCEPTIONS:

1. STRUCTURES DESIGNED IN ACCORDANCE WITH THE PROVISIONS OF SECTIONS 9.1 THROUGH 9.6, 9.13 AND 9.14 OF ASCE 7 SHALL BE PERMITTED.
2. ONE- AND TWO-FAMILY DWELLINGS NOT MORE THAN THREE STORIES IN HEIGHT ARE EXEMPT FROM THE REQUIREMENTS OF SECTIONS 1613 THROUGH 1622.
3. THE SEISMIC-FORCE-RESISTING SYSTEM OF WOOD FRAME BUILDINGS THAT CONFORM TO THE PROVISIONS OF SECTION 2308 ARE NOT REQUIRED TO BE ANALYZED AS SPECIFIED IN SECTION 1616.1.
4. AGRICULTURAL STORAGE STRUCTURES INTENDED ONLY FOR INCIDENTAL HUMAN OCCUPANCY ARE EXEMPT FROM THE REQUIREMENTS OF SECTIONS 1613 THROUGH 1623.

1614.4 QUALITY ASSURANCE. A QUALITY ASSURANCE PLAN SHALL BE PROVIDED WHERE REQUIRED BY CHAPTER 17.

1614.5 SEISMIC AND WIND. WHEN THE CODE-PRESCRIBED WIND DESIGN PRODUCES GREATER EFFECTS, THE WIND DESIGN SHALL GOVERN, BUT DETAILING REQUIREMENTS AND LIMITATIONS PRESCRIBED IN THIS AND REFERENCED SECTIONS SHALL BE FOLLOWED.

1" BUILDING SEPARATION IS REQUIRED FOR EACH 50-0" OF BUILDING HEIGHT AS PER TPPN 2/96

PLUMBING NOTES (NEW RESIDENCE)

1. COMPLETE PLUMBING SYSTEM AND DRAINAGE SYSTEM INSTALLATION SHALL COMPLY WITH 2008 NYC B. CODE
2. PROVIDE CLEANOUTS AT BASE OF ALL STACKS.
3. PROVIDE SHUT OFF VALVES ON ALL WATER SUPPLY LINES AT FIXTURES.
4. PURGE ALL WATER AND GAS LINES BEFORE FINAL CONNECTIONS.
5. PROVIDE AIR CHAMBERS AT TOP OF WATER RISERS MINIMUM 18" HIGH, 12" DIA.
6. STANDARD WEIGHT BLACK STEEL PIPE FOR GAS SYSTEM WITH GALVANIZED STEEL FITTINGS.
7. FOOR DRAINS SHALL BE PROVIDED WITH REMOVABLE STRAINER.
8. TRAPS FOR FLOOR DRAINS SHALL BE DEEP SEAL TYPE.
9. APPROVED TYPE WATER METER TO BE INSTALLED TO CONFORM WITH LEGISLATION SIGNED INTO LAW ON JULY 31, 1985.
10. ALL PIPING INSTALLED TO SERVICE BUILDING AND WITHIN BUILDING SHALL BE THERMALLY INSULATED AS PER NEW YORK STATE ENERGY CONSERVATION CONSTRUCTION CODE.
11. WATER METERS LOCATED OUTSIDE OF THE BUILDING AND WITHIN THE PROPERTY LINE, SHALL BE INSTALLED IN AN ACCESSIBLE, WATERTIGHT AND FROST PROOF PIT OR METER BOX AS PER SEC. P107.3 (B).
12. PLUMBING VENT LINE TO EXTEND 2'-0" MINIMUM ABOVE FINISHED ROOF.
13. INSTALLATION OF WATER SUPPLY SERVICE LINES SHALL COMPLY WITH SEC. P107.2.
14. SEPARATION OF WATER SUPPLY SERVICE AND BUILDING SEWER SHALL COMPLY WITH SEC. P107.2 (B) (6).
15. PROTECTIVE COVER FOR SERVICE PIPE SHALL COMPLY WITH SEC. P107.2 (B) (6).
16. WATER METER LOCATION SHALL BE SUBJECT TO APPROVAL BY THE DEPARTMENT OF WATER SUPPLY, GAS AND ELECTRICITY, AND SHALL COMPLY WITH SEC. P107.3 (B).
17. PRIOR TO THE INSTALLATION OF HOUSE DRAIN, PLUMBING CONTRACTOR SHALL CHECK AND VERIFY DEPTH OF SEWERS/SEWERS IN STREET, TO ASCERTAIN THE COMPLIANCE OF PROVIDING THE MINIMUM REQUIRED PITCH OF HOUSE SEWER, AS PER BUILDING CODE REQUIREMENTS. ANY DISCREPANCIES SHALL BE REPORTED TO ARCHITECT IMMEDIATELY PRIOR TO START OF ANY WORK.
18. ROOF GUTTERS SHALL BE AS PER 2008 NYC B. CODE
19. PLUMBING CONTRACTOR SHALL VERIFY ALL INVERTS AND EXISTING CONDITIONS PRIOR TO THE INSTALLATION OF NEW WORK.
20. ALL HOT AND COLD WATER LINES TO BE INSULATED WITH FIBERGLASS-FOIL BACKED INSULATION JACKETS.
21. WASHING MACHINES TO BE PROVIDED WITH VACUUM BREAKERS. ALL WASHING MACHINES SHALL BE M.E.A. APPROVED BY SINGER CORP., M.E.A. 398-87E.
22. LAUNDRY ROOM / BOILER ROOM FLOOR DRAINS, TRAPS FOR FLOOR DRAINS, SHALL BE DEEP SEAL TYPE.
23. PLUMBING FIXTURES TO COMPLY WITH 2007 NY PLUMBING CODE
24. ALL NEW WATER CLOSETS AND ASSOCIATED FLUSH VALVES INSTALLED MUST MEET WATER SAVING PERFORMANCE STANDARDS AS SUCH.
25. DRYWELLS TO BE INSTALLED @ LOCATION SHOWN ON SD 1-2 APPLICATION FILED WITH THE NYC DEPARMENT OF ENVIROMENT PROTECTION

PROTECTION OF ADJOINING PROPERTY : PROTECTION REQUIRED. ADJOINING PUBLIC AND PRIVATE PROPERTY, INCLUDING PERSONS THEREON, SHALL BE PROTECTED FROM DAMAGE AND INJURY DURING CONSTRUCTION OR DEMOLITION WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THIS SECTION. PROTECTION MUST BE PROVIDED FOR FOOTINGS, FOUNDATIONS, PARTY WALLS, CHIMNEYS, SKYLIGHTS AND ROOFS. PROVISIONS SHALL BE MADE TO CONTROL WATER RUN-OFF AND EROSION DURING CONSTRUCTION OR DEMOLITION ACTIVITIES. AS PER B.C. 3309.1

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 RESPONSIBILITY OF ALTERING SUCH CHIMNEYS OR VENTS TO MAKE THEM CONFORM WITH THE REQUIREMENTS OF B.C. - CHAPTER 2113.1.6.1

REFUSAL OF CONTENT. IF CONTENT 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 NEW OR ALTERED BUILDING AND TO COMMISSIONER; AND THE OWNER OF 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. (B.C. 2113.1.6.5.)

ENERGY CONSERVATION NOTES:

BUILDING TO COMPLY WITH 2010 NEW YORK ENERGY CONSERVATION CONSTRUCTION CODE, ARCHITECTURAL PLANS # COMPLIANCE REPORT CERTIFICATE FROM COMcheck software Version 3.5.1 or 3.9.0.
ALL DISCREPANCIES SHALL BE REPORTED IN WRITING TO THE ARCHITECT IN CHARGE.

BUILDING ENVELOPE REQUIREMENTS:

1. ALL JOINTS AND PENETRATIONS IN THE BUILDING ENVELOPE THAT ARE POTENTIAL SOURCES OF AIR LEAKAGE MUST BE CAULKED, GASKETED, OR COVERED WITH A MOISTURE VAPOR-PERMEABLE WRAPPING MATERIAL.

2. RECESSED LIGHTING FIXTURES MUST BE GASKETED AND IC RATED; I.E., RATED FOR DIRECT CONTACT WITH INSULATION.

3. THE FOLLOWING AREAS MUST BE SEALED:
 - EXTERIOR JOINTS AROUND WINDOW AND DOOR FRAMES
 - BETWEEN WALL SOLE PLATES, FLOORS, AND EXTERIOR-WALL PANELS
 - OPENINGS FOR PLUMBING, ELECTRICITY, AND REFRIGERANT AND GAS LINES IN EXTERIOR WALLS, FLOORS, AND ROOFS
 - OPENINGS IN ATTIC FLOORS (SUCH AS WHERE CEILING PANELS MEET INTERIOR AND EXTERIOR WALLS AND MASONRY FIREPLACES)
 - SERVICE AND ACCESS DOORS OR HATCHES
 - ALL OTHER SIMILAR OPENINGS IN THE BUILDING ENVELOPE.

4. FALLOW ARCHITECTURAL PLANS FOR INSULATION R-VALUES AND GLAZING SHGC # U-FACTORS.

5. EXCEPT AS NOTED BELOW, VAPOR RETARDERS MUST BE INSTALLED IN ALL NONVENTED FRAMED AREAS IN CEILINGS, WALLS, AND FLOORS. THE VAPOR RETARDER MUST HAVE A PERM RATING OF 1.0 OR LESS AND MUST BE INSTALLED ON THE WARM-IN-WINTER SIDE OF THE INSULATION (BETWEEN THE INSULATION AND CONDITIONED SPACE).
   EXCEPTION : VAPOR RETARDERS ARE NOT REQUIRED WHERE MOISTURE OR ITS FREEZING WILL NOT DAMAGE MATERIALS.

6. FIELD CERTIFICATION OF INSTALLED COMPONENTS IS REQUIRED AND CAN BE PROVIDED THROUGH PRODUCT LABELS PRINTED ON DIFFERENT MATERIALS.

BUILDING MECHANICAL REQUIREMENTS:

1. ALL EQUIPMENT AND SYSTEMS MUST BE SIZED TO BE NO GREATER THAN PROPOSED ON MECHANICAL PLANS.

2. EACH HEATING OR COOLING SYSTEM SERVING A SINGLE ZONE MUST HAVE ITS OWN TEMPERATURE CONTROL DEVICE.

3. THERMOSTATS CONTROLLING BOTH HEATING AND COOLING MUST BE CAPABLE OF HAVING A 5 DEG. F DEADBAND. OR RANGE OF TEMPERATURE WHERE NO HEATING OR COOLING IS AVAILABLE.

4. THE SYSTEM MUST SUPPLY OUTSIDE VENTILATION AIR AS REQUIRED BY CHAPTER 4 OF THE INTERNATIONAL MECHANICAL CODE. IF THE VENTILATION SYSTEM IS DESIGNED TO SUPPLY OUTDOOR AIR QUANTITIES EXCEEDING MINIMUM REQUIRED LEVELS, THE SYSTEM MUST BE CAPABLE OF REDUCING OUTDOOR-AIR FLOW THE THE MINIMUM REQUIRED LEVELS. SEE MECHANICAL PLANS.

5. OUTDOOR-AIR SUPPLY SYSTEMS WITH DESIGN AIR FLOW RATES GREATER THAN 3000 CU FT PER MINUTE OF OUTDOOR AIR AND ALL EXHAUST SYSTEMS MUST HAVE DAMPERS THAT AUTOMATICALLY CLOSE WHILE THE EQUIPMENT IS NOT OPERATING.

6. SUPPLY AND RETURN AIR DUCTS FOR CONDITIONED AIR, LOCATED IN UNCONDITIONED SPACE MUST BE INSULATED WITH A MINIMUM OF R-5.

7. SUPPLY AND RETURN AIR DUCTS AND PLENUMS MUST BE INSULATED TO A MIN. OF R-8 WHEN LOCATED OUTSIDE THE BUILDING ENVELOPE.

8. ALL JOINTS, LONGITUDINAL AND TRANSVERSE SEAMS AND CONNECTIONS IN DUCTWORK MUST BE SECURELY SEALED USING WELDMENTS, MECHANICAL FASTENERS WITH SEALS OR GASKETS OR MASTICS, MESH AND MASTIC SEALING SYSTEMS OR TAPES. TAPES AND MASTICS MUST BE LISTED AND LABELED IN ACCORDANCE WITH UL 181A OR UL 181B.

9. DUCTS MUST BE CONNECTED TO FANS AND OTHER AIR DISTRIBUTION EQUIPMENT, INCLUDING MULTI-ZONE TERMINAL UNITS, USING MECHANICAL FASTENERS WITH SEALS, MASTICS OR GASKETS.

10. EACH SUPPLY AIR OUTLET OR DIFFUSER AND EACH ZONE TERMINAL DEVICE (SUCH AS VAV OR MIXING BOXES) MUST HAVE ITS OWN BALANCING DEVICE. ACCEPTABLE BALANCING DEVICES INCLUDE ADJUSTABLE DAMPERS LOCATED WITHIN THE DUCTWORK, TERMINAL DEVICES OR SUPPLY AIR DIFFUSER.

11. ALL PIPES SERVING SPACE CONDITIONING SYSTEMS MUST BE INSULATED TO THE FOLLOWING LEVELS:

FLUID	PIPE DIAMETER	
	<= 1.5"	> 1.5"
HOT WATER	1.0"	2.0"
STEAM	1.5"	3.0"
CHILLED WATER, BRINE, REFRIGERANT	1.0"	1.5"

12. UPON PURCHASE OF MECHANICAL EQUIPMENT, THE OWNER SHALL BE PROVIDED WITH OPERATION AND MAINTENANCE DOCUMENTATION THAT PROVIDES THE FOLLOWING INFORMATION:
   - EQUIPMENT INPUT AND OUTPUT CAPACITY AND REQUIRED MAINTENANCE ACTIONS.
   - EQUIPMENT OPERATION AN MAINTENANCE MANUALS.
   - HVAC SYSTEM CONTROL MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SEQUENCE DESCRIPTIONS. DESIRED OR FIELD DETERMINED SET POINTS MUST BE PERMANENTLY RECORDED ON CONTROL DRAWINGS, AT CONTROL DEVICES, OR, FOR DIGITAL CONTROL SYSTEMS, IN PROGRAMMING COMMENTS.
   - A NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE.

ARCHITECT/ENGENEER SHALL NOT HAVE CONTROL, CHARGE OF AND NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, DEVIATIONS, TECHNIQUES, SEQUENCES, PROCEDURES, SAFETY PRECAUTIONS AND/OR PROGRAMS IN CONNECTION WITH THE WORK, ACTS, OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS OR ANY OTHER PERSON PERFORMING ANY OF THE WORK, AND/OR FOR FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO HIRE PRIOR TO COMMENCEMENT OF ANY WORK AN INDEPENDENT ARCHITECT/ENGINEER TO PERFORM CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE NYC BUILDING CODE. THE ARCHITECT / ENGINEER PERFORMING THE CONTROL INSPECTIONS SHALL INSPECT THE SITE TO INSURE THE SAFETY OF THE SITE, QUALITY OF WORK, COMPLIANCE TO NYC BUILDING CODE, ZONING RESOLUTION, AND / OR ANY APPLICABLE CODE IN ACCORDANCE WITH CONTRACT DOCUMENTS. THE ARCHITECT/ENGINEER, PERFORMING CONTROL INSPECTIONS SHALL SUBMIT THE CONTROL INSPECTIONS, PROGRESS REPORT AND ALL FINDINGS OF THE WORKSITE TO THE DEPARTMENT OF BUILDINGS.

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GENERAL NOTES

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THE IMPLEMENTATION OF THESE DRAWINGS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BRING TO ARCHITECT'S ATTENTION IN WRITING ANY DISCREPANCIES IN THESE PLANS. THE CONTRACTOR SHALL SUBMIT TO ARCHITECT FOR APPROVAL ALL SHOP DRAWINGS AND SPECIFICATIONS RELATED TO THIS PROJECT.

SECTION 504 OF THE REHABILITATION ACT (1973)

UNDER SECTION 504 OF THE REHABILITATION ACT OF 1973 AS AMENDED, NO OTHERWISE QUALIFIED INDIVIDUAL WITH A DISABILITY MAY BE DISCRIMINATED AGAINST IN ANY PROGRAM OR ACTIVITY RECEIVING FEDERAL FINANCIAL ASSISTANCE. THE PURPOSE OF SECTION 504 IS TO ELIMINATE DISCRIMINATORY BEHAVIOR TOWARD PEOPLE WITH DISABILITIES AND TO PROVIDE PHYSICAL ACCESSIBILITY, THUS ENSURING THAT PEOPLE WITH DISABILITIES WILL HAVE THE SAME OPPORTUNITIES IN FEDERALLY FUNDED PROGRAMS AS DO PEOPLE WITHOUT DISABILITIES.
PROGRAM ACCESSIBILITY MAY BE ACHIEVED BY MODIFYING AN EXISTING FACILITY, OR BY MOVING THE PROGRAM TO AN ACCESSIBLE LOCATION, OR BY MAKING OTHER ACCOMMODATIONS, INCLUDING CONSTRUCTION OF NEW BUILDINGS. HUD'S FINAL REGULATION FOR SECTION 504 MAY BE FOUND AT 24 CFR PART 8. GENERALLY, THE UFAS IS THE DESIGN STANDARD FOR PROVIDING PHYSICAL ACCESSIBILITY, ALTHOUGH OTHER STANDARDS WHICH PROVIDE EQUIVALENT OR GREATER ACCESSIBILITY MAY BE USED.

UFAS / 24 CFR PART 8:

§ 8.20 GENERAL REQUIREMENT CONCERNING PROGRAM ACCESSIBILITY.
EXCEPT AS OTHERWISE PROVIDED IN §§ 8.21(C)(1), 8.24(A), 8.25, AND 8.31, NO QUALIFIED INDIVIDUAL WITH HANDICAPS SHALL, BECAUSE A RECIPIENT'S FACILITIES ARE INACCESSIBLE TO OR UNUSABLE BY INDIVIDUALS WITH HANDICAPS, BE DENIED THE BENEFITS OF, BE EXCLUDED FROM PARTICIPATION IN, OR OTHERWISE BE SUBJECTED TO DISCRIMINATION UNDER ANY PROGRAM OR ACTIVITY THAT RECEIVES FEDERAL FINANCIAL ASSISTANCE.

§ 8.22 NEW CONSTRUCTION—HOUSING FACILITIES.
(A) NEW MULTIFAMILY HOUSING PROJECTS (INCLUDING PUBLIC HOUSING AND INDIAN HOUSING PROJECTS AS REQUIRED BY § 8.25) SHALL BE DESIGNED AND CONSTRUCTED TO BE READILY ACCESSIBLE TO AND USABLE BY INDIVIDUALS WITH HANDICAPS.
(B) SUBJECT TO PARAGRAPH (C) OF THIS SECTION, A MINIMUM OF FIVE PERCENT OF THE TOTAL DWELLING UNITS OR AT LEAST ONE UNIT IN A MULTIFAMILY HOUSING PROJECT, WHICHEVER IS GREATER, SHALL BE MADE ACCESSIBLE FOR PERSONS WITH MOBILITY IMPAIRMENTS. A UNIT THAT IS ON AN ACCESSIBLE ROUTE AND IS ADAPTABLE AND OTHERWISE IN COMPLIANCE WITH THE STANDARDS SET FORTH IN § 8.32 IS ACCESSIBLE FOR PURPOSES OF THIS SECTION. AN ADDITIONAL TWO PERCENT OF THE UNITS (BUT NOT LESS THAN ONE UNIT) IN SUCH A PROJECT SHALL BE ACCESSIBLE FOR PERSONS WITH HEARING OR VISION IMPAIRMENTS.

§ 8.26 DISTRIBUTION OF ACCESSIBLE DWELLING UNITS.
ACCESSIBLE DWELLING UNITS REQUIRED BY § 8.22, 8.23, 8.24 OR 8.25 SHALL, TO THE MAXIMUM EXTENT FEASIBLE AND SUBJECT TO REASONABLE HEALTH AND SAFETY REQUIREMENTS, BE DISTRIBUTED THROUGHOUT PROJECTS AND SITES AND SHALL BE AVAILABLE IN A SUFFICIENT RANGE OF SIZES AND AMENITIES SO THAT A QUALIFIED INDIVIDUAL WITH HANDICAPS' CHOICE OF LIVING ARRANGEMENTS IS, AS A WHOLE, COMPARABLE TO THAT OF OTHER PERSONS ELIGIBLE FOR HOUSING ASSISTANCE UNDER THE SAME PROGRAM. THIS PROVISION SHALL NOT BE CONSTRUED TO REQUIRE PROVISION OF AN ELEVATOR IN ANY MULTIFAMILY HOUSING PROJECT SOLELY FOR THE PURPOSE OF PERMITTING LOCATION OF ACCESSIBLE UNITS ABOVE OR BELOW THE ACCESSIBLE GRADE LEVEL.

§ 8.27 OCCUPANCY OF ACCESSIBLE DWELLING UNITS.
(A) OWNERS AND MANAGERS OF MULTIFAMILY HOUSING PROJECTS HAVING ACCESSIBLE UNITS SHALL ADOPT SUITABLE MEANS TO ASSURE THAT INFORMATION REGARDING THE AVAILABILITY OF ACCESSIBLE UNITS REACHES ELIGIBLE INDIVIDUALS WITH HANDICAPS, AND SHALL TAKE REASONABLE NONDISCRIMINATORY STEPS TO MAXIMIZE THE UTILIZATION OF SUCH UNITS BY ELIGIBLE INDIVIDUALS WHOSE DISABILITY REQUIRES THE ACCESSIBILITY FEATURES OF THE PARTICULAR UNIT. TO THIS END, WHEN AN ACCESSIBLE UNIT BECOMES VACANT, THE OWNER OR MANAGER BEFORE OFFERING SUCH UNITS TO A NON-HANDICAPPED APPLICANT SHALL OFFER SUCH UNIT:
(1) FIRST, TO A CURRENT OCCUPANT OF ANOTHER UNIT OF THE SAME PROJECT, OR COMPARABLE PROJECTS UNDER COMMON CONTROL, HAVING HANDICAPS REQUIRING THE ACCESSIBILITY FEATURES OF THE VACANT UNIT AND OCCUPYING A UNIT NOT HAVING SUCH FEATURES, OR, IF NO SUCH OCCUPANT EXISTS, THEN
(2) SECOND, TO AN ELIGIBLE QUALIFIED APPLICANT ON THE WAITING LIST HAVING A HANDICAP REQUIRING THE ACCESSIBILITY FEATURES OF THE VACANT UNIT.
(B) WHEN OFFERING AN ACCESSIBLE UNIT TO AN APPLICANT NOT HAVING HANDICAPS REQUIRING THE ACCESSIBILITY FEATURES OF THE UNIT, THE OWNER OR MANAGER MAY REQUIRE THE APPLICANT TO AGREE (AND MAY INCORPORATE THIS AGREEMENT IN THE LEASE) TO MOVE TO A NON-ACCESSIBLE UNIT WHEN AVAILABLE.

§ 8.32 ACCESSIBILITY STANDARDS.
(A) EFFECTIVE AS OF JULY 11, 1988, DESIGN, CONSTRUCTION, OR ALTERATION OF BUILDINGS IN CONFORMANCE WITH SECTIONS 3-8 OF THE UNIFORM FEDERAL ACCESSIBILITY STANDARDS (UFAS) SHALL BE DEEMED TO COMPLY WITH THE REQUIREMENTS OF §§ 8.21, 8.22, 8.23, AND 8.25 WITH RESPECT TO THOSE BUILDINGS. DEPARTURES FROM PARTICULAR TECHNICAL AND SCOPING REQUIREMENTS OF THE UFAS BY THE USE OF OTHER METHODS ARE PERMITTED WHERE SUBSTANTIALLY EQUIVALENT OR GREATER ACCESS TO AND USABILITY OF THE BUILDING IS PROVIDED. THE ALTERATION OF HOUSING FACILITIES SHALL ALSO BE IN CONFORMANCE WITH ADDITIONAL SCOPING REQUIREMENTS CONTAINED IN THIS PART. PERSONS INTERESTED IN OBTAINING A COPY OF THE UFAS ARE DIRECTED TO § 40.7 OF THIS TITLE.
(B) FOR PURPOSES OF THIS SECTION, SECTION 4.1.6(1)(G) OF UFAS SHALL BE INTERPRETED TO EXEMPT FROM THE REQUIREMENTS OF UFAS ONLY MECHANICAL ROOMS AND OTHER SPACES THAT, BECAUSE OF THEIR INTENDED USE, WILL NOT REQUIRE ACCESSIBILITY TO THE PUBLIC OR BENEFICIARIES OR RESULT IN THE EMPLOYMENT OR RESIDENCE THEREIN OF INDIVIDUALS WITH PHYSICAL HANDICAPS.
(C) THIS SECTION DOES NOT REQUIRE RECIPIENTS TO MAKE BUILDING ALTERATIONS THAT HAVE LITTLE LIKELIHOOD OF BEING ACCOMPLISHED WITHOUT REMOVING OR ALTERING A LOAD-BEARING STRUCTURAL MEMBER.
(D) FOR PURPOSES OF THIS SECTION, SECTION 4.1.4(11) OF UFAS MAY NOT BE USED TO WAIVE OR LOWER THE MINIMUM OF FIVE PERCENT ACCESSIBLE UNITS REQUIRED BY § 8.22(B) OR TO APPLY THE MINIMUM ONLY TO PROJECTS OF 15 OR MORE DWELLING UNITS.
(E) EXCEPT AS OTHERWISE PROVIDED IN THIS PARAGRAPH, THE PROVISIONS OF §§ 8.21 (A) AND (B), 8.22 (A) AND (B), 8.23, 8.25(A) (1) AND (2), AND 8.29 SHALL APPLY TO FACILITIES THAT ARE DESIGNED, CONSTRUCTED OR ALTERED AFTER JULY 11, 1988. IF THE DESIGN OF A FACILITY WAS COMMENCED BEFORE JULY 11, 1988, THE PROVISIONS SHALL BE FOLLOWED TO THE MAXIMUM EXTENT PRACTICABLE, AS DETERMINED BY THE DEPARTMENT. FOR PURPOSES OF THIS PARAGRAPH, THE DATE A FACILITY IS CONSTRUCTED OR ALTERED SHALL BE DEEMED TO BE THE DATE BIDS FOR THE CONSTRUCTION OR ALTERATION OF THE FACILITY ARE SOLICITED. FOR PURPOSES OF THE URBAN DEVELOPMENT ACTION GRANT (UDAG) PROGRAM, THE PROVISIONS SHALL APPLY TO THE CONSTRUCTION OR ALTERATION OF FACILITIES THAT ARE FUNDED UNDER APPLICATIONS SUBMITTED AFTER JULY 11, 1988. IF THE UDAG APPLICATION WAS SUBMITTED BEFORE JULY 11, 1988, THE PROVISIONS SHALL APPLY, TO THE MAXIMUM EXTENT PRACTICABLE, AS DETERMINED BY THE DEPARTMENT.
[53 FR 20233, JUNE 2, 1988, AS AMENDED AT 61 FR 5205, FEB. 9, 1996]

SECTION 504 OF HUD
NEW CONSTRUCTION. HUD REGULATIONS IMPLEMENTING SECTION 504 AT 24 CFR 8.22(A)
FOR NEW CONSTRUCTION OF MULTIFAMILY RENTAL PROJECTS, A MINIMUM OF 5 PERCENT OF THE DWELLING UNITS IN THE PROJECT (BUT NOT LESS THAN ONE UNIT) MUST BE ACCESSIBLE TO INDIVIDUALS WITH MOBILITY IMPAIRMENTS. AN ADDITIONAL 2 PERCENT OF THE DWELLING UNITS (BUT AT A MINIMUM, NOT LESS THAN ONE UNIT) MUST BE ACCESSIBLE TO INDIVIDUALS WITH SENSORY IMPAIRMENTS (I.E., HEARING OR VISION IMPAIRMENTS) UNLESS HUD PRESCRIBES A HIGHER NUMBER PURSUANT TO 24 CFR 8.22(C).
TOTAL PROPOSED NUMBER OF UNITS =40 UNITS.
MIN. REQUIRED NUMBER OF APARTMENTS ACCESSIBLE FOR TO INDIVIDUALS WITH MOBILITY IMPAIRMENTS:
40 UNIT x 5% =2 UNITS. NUMBER OF PROVIDED UNITS TO COMPLY=2.
MIN. REQUIRED NUMBER OF APARTMENTS ACCESSIBLE FOR TO INDIVIDUALS WITH SENSORY IMPAIRMENTS:
40 UNIT x 2% =0.8 UNIT. NUMBER OF PROVIDED UNITS TO COMPLY=1 < 0.8. OK.

MOBILITY ACCESSIBLE UNITS REQUIRED	-2 UNITS	
MOBILITY ACCESSIBLE UNITS PROVIDED	-2 UNITS	(APT. 2A (IH UNIT) AND APT.4B)
SENSORITY ACCESSIBLE UNITS REQUIRED	-1 UNIT	
SENSORITY ACCESSIBLE UNITS PROVIDED	-1 UNIT	(APT. 3E (IH UNIT))

SECTION 504 OF HUD ACCESSIBILITY STANDARDS
DWELLING UNITS DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE UNIFORM FEDERAL ACCESSIBILITY STANDARDS (UFAS) WILL BE DEEMED TO COMPLY WITH THE SECTION 504 REGULATION.

SECTION OF THE FAIR HOUSING ACT AT 804(F)(3)(C) REQUIRES THAT COVERED MULTIFAMILY DWELLING UNITS DESIGNED AND CONSTRUCTED FOR INITIAL OCCUPANCY AFTER MARCH 13, 1991, BE DESIGNED AND CONSTRUCTED IN A MANNER THAT:
(I) THE PUBLIC AND COMMON USE PORTIONS OF SUCH DWELLINGS ARE READILY ACCESSIBLE TO AND USABLE BY DISABLED PERSONS;
(II) THE DOORS ARE DESIGNED TO ALLOW PASSAGE INTO AND WITHIN THE PREMISES OF SUCH DWELLING UNITS AND ARE SUFFICIENTLY WIDE TO ALLOW PASSAGE BY DISABLED PERSONS IN WHEELCHAIRS; AND
(III) ALL PREMISES WITHIN SUCH DWELLING UNITS CONTAIN THE FOLLOWING FEATURES OF ADAPTIVE DESIGN:
I) AN ACCESSIBLE ROUTE INTO AND THROUGH THE DWELLING UNIT;
II) LIGHT SWITCHES, ELECTRICAL OUTLETS, THERMOSTATS, AND OTHER ENVIRONMENTAL CONTROLS IN

Z.R. 23-90 INCLUSIONARY HOUSING PROGRAM

GUIDELINES THE "GUIDELINES" ARE THE #GUIDELINES# ADOPTED BY #HPD#, PURSUANT TO PARAGRAPH (K) OF SECTION 23-96 (REQUIREMENTS FOR GENERATING SITES).

SUPER'S UNIT A "SUPER'S UNIT" IS, IN ANY #GENERATING SITE#, NOT MORE THAN ONE #DWELLING UNIT# OR #ROOMING UNIT# THAT IS RESERVED FOR OCCUPANCY BY THE SUPERINTENDENT OF SUCH #BUILDING#. NOT PROPOSED.

23-92 GENERAL PROVISIONS
THE INCLUSIONARY HOUSING PROGRAM IS ESTABLISHED TO PROMOTE THE CREATION AND PRESERVATION OF HOUSING FOR RESIDENTS WITH VARIED INCOMES IN REDEVELOPING NEIGHBORHOODS AND THUS TO PROMOTE THE GENERAL WELFARE. THE REQUIREMENTS OF THIS PROGRAM ARE SET FORTH IN SECTION 23-90 (INCLUSIONARY HOUSING), INCLUSIVE. WHEREVER THE PROVISIONS OF SECTION 23-90, INCLUSIVE, PROVIDE THAT APPROVAL IS REQUIRED, #HPD# MAY SPECIFY THE FORM OF SUCH APPROVAL IN THE #GUIDELINES#.

23-96 REQUIREMENTS FOR GENERATING SITES:
(B) DISTRIBUTION OF #AFFORDABLE HOUSING UNITS#
IN #NEW CONSTRUCTION AFFORDABLE HOUSING# OR #SUBSTANTIAL REHABILITATION AFFORDABLE HOUSING#, WHERE ONE OR MORE OF THE #DWELLING UNITS# OR #ROOMING UNITS# IN A #GENERATING SITE#, OTHER THAN ANY #SUPER'S UNIT#, ARE NOT #AFFORDABLE HOUSING UNITS#:
(1) THE #AFFORDABLE HOUSING UNITS# SHALL BE DISTRIBUTED ON NOT LESS THAN 65 PERCENT OF THE #RESIDENTIAL STORIES# OF SUCH #GENERATING SITE# OR, IF THERE ARE INSUFFICIENT #AFFORDABLE HOUSING UNITS# TO COMPLY WITH THIS REQUIREMENT, THE DISTRIBUTION OF #AFFORDABLE HOUSING UNITS# SHALL BE AS SPECIFIED IN THE #GUIDELINES#; AND
PROPOSED NUMBER OF STORIES =6;
PROPOSED AFFORDABLE UNITS ON 2ND, 3RD, 4TH AND 5TH FLOORS -4 STORY.
100/6 x4 =66.67% (AFFORDABLE UNITS DISTRIBUTED ON 66.67% OF FLOORS
66.67% > 65%. OK.
(2) NOT MORE THAN ONE-THIRD OF THE #DWELLING UNITS# AND #ROOMING UNITS# ON ANY #STORY# OF SUCH #GENERATING SITE# SHALL BE #AFFORDABLE HOUSING UNITS#, UNLESS NOT LESS THAN ONE-THIRD OF THE #DWELLING UNITS# AND #ROOMING UNITS# ON EACH #RESIDENTIAL STORY# OF SUCH #GENERATING SITE# ARE #AFFORDABLE HOUSING UNITS#. HOWEVER, ON A #RESIDENTIAL STORY# WITH FEWER THAN THREE #DWELLING UNITS# OR #ROOMING UNITS#, ONLY ONE #DWELLING UNIT# OR #ROOMING UNIT# MAY BE AN #AFFORDABLE HOUSING UNIT#, UNLESS NOT LESS THAN ONE #DWELLING UNIT# OR #ROOMING UNIT# ON EACH FLOOR IS AN #AFFORDABLE HOUSING UNIT#.

TOTAL PROPOSED NUMBER OF UNITS ON STORY = 7 UNITS.
MAX. PERMITTED NUMBER OF UNITS PER STORY = 7 / 3= 2.33 = 2 UNITS PER STORY;
MAXIMUM PROPOSED NUMBER OF AFFORDABLE UNITS PER STORY =2 UNITS. OK.

UNIT BEDROOM MIX CHART

CONSTRUCTION FLOOR	MARKETING FLOOR	TOTAL OF UNITS PER FLOOR	IH UNITS PER FLOOR	STAFF UNITS PER FLOOR	NON-IH UNITS PER FLOOR	IH PERCENTAGE
1	1	5	0	0	5	0%
2	2	7	2	0	5	28.57%
3	3	7	2	0	5	28.57%
4	4	7	2	0	5	28.57%
5	5	7	2	0	5	28.57%
6	6	7	0	0	7	0%
		40	8	0	32	0%

(C) BEDROOM MIX OF #AFFORDABLE HOUSING UNITS#
(1) IN #NEW CONSTRUCTION AFFORDABLE HOUSING# AND #SUBSTANTIAL REHABILITATION AFFORDABLE HOUSING#, WHERE ONE OR MORE OF THE #DWELLING UNITS# IN A #GENERATING SITE#, OTHER THAN ANY #SUPER'S UNIT#, ARE NOT #AFFORDABLE HOUSING UNITS#, EITHER:
(I) THE #DWELLING UNITS# IN THE #GENERATING SITE# THAT ARE #AFFORDABLE HOUSING UNITS# SHALL CONTAIN A BEDROOM MIX AT LEAST PROPORTIONAL TO THE BEDROOM MIX OF THE #DWELLING UNITS# IN THE #GENERATING SITE#, OTHER THAN ANY #SUPER'S UNIT#, THAT ARE NOT #AFFORDABLE HOUSING UNITS#; OR
(II) NOT LESS THAN 50 PERCENT OF THE #DWELLING UNITS# IN THE #GENERATING SITE# THAT ARE #AFFORDABLE HOUSING UNITS# SHALL CONTAIN TWO OR MORE BEDROOMS AND NOT LESS THAN 75 PERCENT OF THE #DWELLING UNITS# IN THE #GENERATING SITE# THAT ARE #AFFORDABLE HOUSING UNITS# SHALL CONTAIN ONE OR MORE BEDROOMS.

UNIT BEDROOM MIX CHART

IH UNIT TYPES	NO OF UNITS	BREAKDOWN	NON-IH UNIT TYPES	NO OF UNITS	BREAKDOWN	SUPER / STAFF UNITS	TOTAL NUMBER OF UNITS
STUDIO	0	0.00%	STUDIO	0	0.00%		0
1-BD	6	75.00%	1-BD	24	75.00%		30
2-BD	2	25.00%	2-BD	8	25.00%		10
3-BD	0	0.00%	3-BD	0	0.00%		0
TOTAL	8	100.00%	TOTAL	32	100.00%	0	40

NOTE:
A. FOR DETAILS SEE AFFORDABLE UNIT AREA DIAGRAM AND CALCULATIONS ON PAGES A-103; A-104; A-105

(D) SIZE OF #AFFORDABLE HOUSING UNITS#
(1) IN #NEW CONSTRUCTION AFFORDABLE HOUSING# AND #SUBSTANTIAL REHABILITATION AFFORDABLE HOUSING#, AN #AFFORDABLE HOUSING UNIT# SHALL CONTAIN NOT LESS THAN:
(I) 400 SQUARE FEET OF #FLOOR AREA# WITHIN THE PERIMETER WALLS FOR A ZERO BEDROOM #DWELLING UNIT#, OR
(II) 575 SQUARE FEET OF #FLOOR AREA# WITHIN THE PERIMETER WALLS FOR A ONE BEDROOM #DWELLING UNIT#, OR
(III) 775 SQUARE FEET OF #FLOOR AREA# WITHIN THE PERIMETER WALLS FOR A TWO BEDROOM #DWELLING UNIT#, OR
(IV) 950 SQUARE FEET OF #FLOOR AREA# WITHIN THE PERIMETER WALLS FOR A THREE BEDROOM #DWELLING UNIT#.

PROPOSED AFFORDABLE UNITS ARE 1 AND 2 BEDROOM UNITS:
MINIMUM AREA OF AFFORDABLE 1 BR UNIT = 575.84 SQ.FT. > 575 SQ.FT. OK;
MINIMUM AREA OF AFFORDABLE 2 BR UNIT = 778.28 SQ.FT. > 775 SQ.FT. OK.

(E) HOUSING STANDARDS
THE REQUIREMENTS OF SECTION 23-96, PARAGRAPH (G), SHALL APPLY. IN ADDITION, EACH #HOMEOWNER# SHALL BE OBLIGATED TO MAINTAIN EACH #HOMEOWNERSHIP AFFORDABLE HOUSING UNIT# IN ACCORDANCE WITH MINIMUM QUALITY STANDARDS SET FORTH IN THE #GUIDELINES#. PRIOR TO ANY #RESALE#, #HPD#, OR ITS DESIGNEE AS SPECIFIED IN THE #GUIDELINES#, SHALL INSPECT THE #AFFORDABLE HOUSING UNIT# AND SHALL EITHER REQUIRE THE #HOMEOWNER# TO REMEDY ANY CONDITION THAT VIOLATES SUCH MINIMUM QUALITY STANDARDS BEFORE THE #SALE DATE#, OR REQUIRE THE RETENTION OF A PORTION OF THE #RESALE# PROCEEDS TO PAY THE COST OF REMEDYING SUCH CONDITION.

2014 NEW YORK CITY BUILDING CODE:

310.1.2 GROUP R-2. THIS OCCUPANCY SHALL INCLUDE BUILDINGS OR PORTIONS THEREOF CONTAINING SLEEPING UNITS OR MORE THAN TWO DWELLING UNITS THAT ARE OCCUPIED FOR PERMANENT RESIDENT PURPOSES AS DEFINED IN SUBPARAGRAPH (A) OF PARAGRAPH EIGHT OF SUBDIVISION A OF SECTION 27-2004 OF THE NEW YORK CITY HOUSING MAINTENANCE CODE. SUCH OCCUPANCY SHALL BE SUBJECT TO THE NEW YORK STATE MULTIPLE DWELLING LAW.

1101.1 SCOPE. THE PROVISIONS OF THIS CHAPTER AND APPENDICES E, N AND P SHALL CONTROL THE DESIGN AND CONSTRUCTION OF FACILITIES FOR ACCESSIBILITY TO PERSONS WITH PHYSICAL DISABILITIES.
1101.2 DESIGN. BUILDINGS AND FACILITIES SHALL BE DESIGNED AND CONSTRUCTED TO BE ACCESSIBLE IN ACCORDANCE WITH THIS CODE AND ICC A117.1.

1103.1 WHERE REQUIRED. SITES, BUILDINGS, STRUCTURES, FACILITIES, ELEMENTS AND SPACES, TEMPORARY OR PERMANENT, SHALL BE ACCESSIBLE TO PERSONS WITH PHYSICAL DISABILITIES.
1104.4 MULTILEVEL BUILDINGS AND FACILITIES. AT LEAST ONE ACCESSIBLE ROUTE SHALL CONNECT EACH ACCESSIBLE LEVEL, INCLUDING MEZZANINES, IN MULTILEVEL BUILDINGS AND FACILITIES.
1104.5 LOCATION. ACCESSIBLE ROUTES SHALL COINCIDE WITH OR BE LOCATED IN THE SAME AREA AS A GENERAL CIRCULATION PATH. WHERE THE CIRCULATION PATH IS INTERIOR, THE ACCESSIBLE ROUTE SHALL ALSO BE INTERIOR. WHERE ONLY ONE ACCESSIBLE ROUTE IS PROVIDED, THE ACCESSIBLE ROUTE SHALL NOT PASS THROUGH KITCHENS, STORAGE ROOMS, RESTROOMS, CLOSETS OR SIMILAR SPACES.
EXCEPTION: A SINGLE ACCESSIBLE ROUTE IS PERMITTED TO PASS THROUGH A KITCHEN IN AN ACCESSIBLE UNIT, TYPE B+NYC UNIT, OR TYPE B UNIT.
1105.1.6 TENANT SPACES. ALL ENTRANCES TO TENANT SPACES THAT ARE REQUIRED TO BE ACCESSIBLE SHALL BE ACCESSIBLE ENTRANCES.
1105.1.6.1 DWELLING UNITS AND SLEEPING UNITS. DOORS AND DOORWAYS AT ENTRANCE(S) TO ACCESSIBLE UNITS AND TYPE B+NYC UNITS, INCLUDING HARDWARE, SHALL COMPLY WITH SECTION 404 (DOORS AND DOORWAYS) OF ICC A117.1. DOORS AND DOORWAYS, INCLUDING HARDWARE, AT ENTRANCE(S) TO TYPE B UNITS SHALL COMPLY WITH SECTION 1003.5 (DOORS AND DOORWAYS) OF ICC A117.1.
EXCEPTIONS:
1. AN ACCESSIBLE ENTRANCE IS NOT REQUIRED TO DWELLING UNITS AND SLEEPING UNITS THAT ARE NOT REQUIRED TO BE ACCESSIBLE UNITS, TYPE B+NYC UNITS, OR TYPE B UNITS.
2. ENTRANCES TO MULTISTORY DWELLING OR SLEEPING UNITS IN R-2 OCCUPANCY AS PROVIDED IN SECTION 1107.2.5 THAT ARE NOT ON THE PRIMARY ENTRY STORY TO THE UNIT AND ARE NOT PART OF THE ACCESSIBLE ROUTE REQUIRED IN EXCEPTION 1 OF SECTION 1107.2.5 SHALL NOT BE REQUIRED TO BE ACCESSIBLE.
3. IN GROUP I-2 FACILITIES, DOORS TO SLEEPING UNITS SHALL BE EXEMPTED FROM THE REQUIREMENTS FOR MANEUVERING CLEARANCE AT THE ROOM SIDE PRO- VIDED THE DOOR IS A MINIMUM OF 44 INCHES (1118 MM) IN WIDTH.

DWELLING UNITS AND SLEEPING UNITS:

1107.6 GROUP R. ACCESSIBLE UNITS, TYPE B+NYC UNITS AND TYPE B UNITS SHALL BE PROVIDED IN GROUP R OCCUPANCIES IN ACCORDANCE WITH SECTIONS 1107.6.1 THROUGH 1107.6.3.
1107.6.2 GROUP R-2. TYPE B+NYC UNITS AND TYPE B
UNITS SHALL BE PROVIDED IN OCCUPANCIES IN GROUP R-2 IN ACCORDANCE WITH SECTION 1107.6.2.1.
1107.6.2.1 TYPE B AND TYPE B+NYC UNITS. EVERY DWELLING UNIT AND SLEEPING UNIT SHALL BE A TYPE B+NYC UNIT UNLESS THE NUMBER OF TYPE B+NYC UNITS IS PERMITTED TO BE REDUCED IN ACCORDANCE WITH SECTION 1107.7.4. WHERE NO TYPE B+NYC UNITS ARE REQUIRED IN ACCORDANCE WITH SECTION 1107.7.4, ALL UNITS INTENDED TO BE OCCUPIED AS A RESIDENCE SHALL BE TYPE B UNITS.

1107.1 GENERAL. IN ADDITION TO THE OTHER REQUIREMENTS OF THIS CHAPTER, OCCUPANCIES HAVING DWELLING UNITS OR SLEEPING UNITS SHALL BE PROVIDED WITH ACCESSIBLE FEATURES IN ACCORDANCE WITH THIS SECTION.
1107.2 DESIGN. DWELLING UNITS AND SLEEPING UNITS WHICH ARE REQUIRED TO BE ACCESSIBLE UNITS, TYPE B+NYC UNITS, OR TYPE B UNITS SHALL COMPLY WITH THIS CODE INCLUDING APPENDIX P WHERE APPLICABLE, AND THE APPLICABLE PROVISIONS OF CHAPTER 10 OF ICC A117.1. IN ADDITION, TYPE B+NYC UNITS SHALL COMPLY WITH SECTIONS 1107.2.1 THROUGH 1107.2.8. UNITS REQUIRED TO BE TYPE B+NYC UNITS OR TYPE B UNITS ARE PERMITTED TO BE DESIGNED AND CONSTRUCTED AS ACCESSIBLE UNITS.
1107.2.2 TYPE B+NYC UNIT TOILET AND BATHING ROOMS.I WHERE TOILET AND BATHING ROOMS ARE PROVIDED IN THE TYPE B+NYC DWELLING UNIT OR SLEEPING UNIT, ALL SUCH TOILET AND BATHING ROOMS SHALL COMPLY WITH APPENDIX P.

1107.2.3 TYPE B+NYC UNIT KITCHEN AND KITCHENETTE.
WHERE KITCHENS AND KITCHENETTES ARE PROVIDED IN THE TYPE B+NYC DWELLING UNIT OR SLEEPING UNIT, THE PRIMARY KITCHEN OR KITCHENETTE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE KITCHEN REQUIREMENTS OF SECTION 1003.12 (KITCHEN) OF ICC A117.1 AND SECTIONS 1107.2.3.1 THROUGH 1107.2.3.5 OF THIS CODE. SECONDARY KITCHENS AND KITCHENETTES WITHIN THE SAME DWELLING UNIT OR SLEEPING UNIT SHALL BE REQUIRED TO COMPLY ONLY WITH SECTION 1004.12 (KITCHENS) OF ICC A117.1.
1107.2.3.2 APPLIANCES IN KITCHEN AND KITCHENETTE.
APPLIANCES SHALL COMPLY WITH SECTION 1003.12.5 (APPLIANCES) OF ICC A117.1.

1107.2.4 TYPE B+NYC UNIT OPERABLE WINDOWS. ALL OPERABLE WINDOWS REQUIRED TO PROVIDE NATURAL VENTILATION AND/OR AN EMERGENCY ESCAPE AND RESCUE OPENING IN ROOMS OR SPACES IN THE TYPE B+NYC DWELLING UNIT OR SLEEPING UNIT SHALL COMPLY WITH SECTION 1003.13 (WINDOWS) OF ICC A117.1.
1107.3 ACCESSIBLE SPACES.
ROOMS AND SPACES AVAILABLE TO THE GENERAL PUBLIC OR AVAILABLE FOR COMMON USE BY RESIDENTS OF ACCESSIBLE UNITS, TYPE B+NYC UNITS, OR TYPE B UNITS SHALL BE ACCESSIBLE. ACCESSIBLE SPACES SHALL INCLUDE, BUT NOT BE LIMITED TO, SPACES FOR RESIDENTS' USE, SUCH AS LAUNDRY ROOMS, REFUSE DISPOSAL AND STORAGE LOCATIONS, MAILBOX AREAS, RECREATIONAL FACILITIES, ASSEMBLY AND TENANTS' MEETING ROOMS, STORAGE ROOMS, PARKING AREAS, TOILET AND BATHING ROOMS, KITCHEN, LIVING AND DINING AREAS, ANY EXTERIOR SPACES, INCLUDING PATIOS, TERRACES AND BALCONIES, MANAGEMENT OFFICES, AND STORES.

1107.3.1 MAILBOXES.
EXCEPT AS OTHERWISE PROVIDED BY RULES OF THE DEPARTMENT FOR THE PURPOSES OF COMPLYING WITH RULES AND REGULATIONS ESTABLISHED BY THE UNITED STATES
POSTAL SERVICE AND/OR THE UNITED STATES DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, WHERE MAILBOXES ARE PROVIDED FOR EACH DWELLING UNIT OR SLEEPING UNIT IN AN INTERIOR LOCATION, 100 PERCENT OF SUCH MAILBOXES SHALL COMPLY WITH ICC A117.1, AND THE OPERABLE PARTS OF SUCH MAILBOXES SHALL BE NO HIGHER THAN 48 INCHES (1219 MM)
ABOVE THE FINISHED FLOOR.

APPENDIX P
TYPE B+NYC UNIT TOILET AND BATHING ROOMS REQUIREMENTS:
P101.1 SCOPE. ALL TOILET AND BATHING ROOMS WITHIN A DWELLING UNIT OR SLEEPING UNIT SUBJECT TO APPENDIX P PURSUANT TO SECTION 1107.2.2 SHALL COMPLY WITH SECTION P102. WITHIN EACH SUCH TOILET AND BATHING ROOM, AT LEAST ONE LAVATORY, ONE WATER CLOSET AND EITHER A BATHTUB OR SHOWER SHALL COMPLY WITH SECTION P102; ADDITIONAL FIXTURES PROVIDED WITHIN SUCH TOILET AND BATHING ROOM SHALL COMPLY WITH SECTIONS 1004.11.3.1.1 (LAVATORY), 1004.11.3.1.2 (WATER CLOSET), AND 1004.11.3.1.3 (BATHING FIXTURES) OF ICC A117.1.1 TOILET AND BATHING FIXTURES SHALL BE IN A SINGLE ROOM, SUCH THAT TRAVEL BETWEEN FIXTURES DOES NOT REQUIRE TRAVEL BEYOND THE ROOM IN WHICH THE FIXTURE(S) OF SUCH TOILET OR BATHING ROOM IS LOCATED. IN A ROOM, CONTAINING ONLY A LAVATORY AND A WATER CLOSET, SUCH LAVATORY AND WATER CLOSET SHALL COMPLY WITH SECTION P102.

UFAS REQUIREMENTS: 4.28 ALARMS.
4.28.1 GENERAL. ALARM SYSTEMS REQUIRED TO BE ACCESSIBLE BY 4.1 SHALL COMPLY WITH 4.28.
4.28.2* AUDIBLE ALARMS. IF PROVIDED, 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.
4.28.3* VISUAL ALARMS. IF PROVIDED, ELECTRICALLY POWERED INTERNALLY ILLUMINATED EMERGENCY EXIT SIGNS SHALL FLASH AS A VISUAL EMERGENCY ALARM IN CONJUNCTION WITH AUDIBLE EMERGENCY ALARMS. THE FLASHING FREQUENCY OF VISUAL ALARM DEVICES SHALL BE LESS THAN 5 HZ. IF SUCH ALARMS USE ELECTRICITY FROM THE BUILDING AS A POWER SOURCE, THEN THEY SHALL BE INSTALLED ON THE SAME SYSTEM AS THE AUDIBLE EMERGENCY ALARMS.
EXCEPTIONS:
(1) VISUAL ALARM DEVICES THAT ARE MOUNTED ADJACENT TO EMERGENCY EXIT SIGNS MAY BE USED IN LIEU OF FLASHING EXIT SIGNS.
(2) SPECIALIZED SYSTEMS UTILIZING ADVANCED TECHNOLOGY MAY BE SUBSTITUTED FOR THE VISUAL SYSTEMS SPECIFIED ABOVE IF EQUIVALENT PROTECTION IS AFFORDED HANDICAPPED USERS OF THE BUILDING OR FACILITY.
4.28.4* AUXILIARY ALARMS. ACCESSIBLE SLEEPING ACCOMMODATIONS SHALL HAVE A VISUAL ALARM CONNECTED TO THE BUILDING EMERGENCY ALARM SYSTEM OR SHALL HAVE A STANDARD 110-VOLT ELECTRICAL RECEPTACLE INTO WHICH SUCH AN ALARM COULD BE CONNECTED. INSTRUCTIONS FOR USE OF THE AUXILIARY ALARM OR CONNECTION SHALL BE PROVIDED.

B.C. 1008.4.4 INTERCOMMUNICATION SYSTEM. BUILDINGS CONTAINING EIGHT OR MORE DWELLING UNITS SHALL BE PROVIDED WITH AN INTERCOMMUNICATION SYSTEM LOCATED AT THE DOOR GIVING ACCESS TO THE MAIN ENTRANCE LOBBY, CONSISTING OF A DEVICE OR DEVICES FOR VOICE COMMUNICATION BETWEEN THE OCCUPANT OF EACH DWELLING UNIT AND A PERSON OUTSIDE THE DOOR TO THE MAIN ENTRANCE LOBBY, AND PERMITTING SUCH DWELLING UNIT OCCUPANT TO RELEASE THE LOCKING MECHANISM OF SAID DOOR FROM THE DWELLING UNIT.

2010 ADA STANDARDS FOR ACCESSIBLE DESIGN
233.3.1.1 RESIDENTIAL DWELLING UNITS WITH MOBILITY FEATURES. IN FACILITIES WITH RESIDENTIAL DWELLING UNITS, AT LEAST 5 PERCENT, BUT NO FEWER THAN ONE UNIT, OF THE TOTAL NUMBER OF RESIDENTIAL DWELLING UNITS SHALL PROVIDE MOBILITY FEATURES COMPLYING WITH 809.2 THROUGH 809.4 AND SHALL BE ON AN ACCESSIBLE ROUTE AS REQUIRED BY 206.
233.3.1.2 RESIDENTIAL DWELLING UNITS WITH COMMUNICATION FEATURES. IN FACILITIES WITH RESIDENTIAL DWELLING UNITS, AT LEAST 2 PERCENT, BUT NO FEWER THAN ONE UNIT, OF THE TOTAL NUMBER OF RESIDENTIAL DWELLING UNITS SHALL PROVIDE COMMUNICATION FEATURES COMPLYING WITH 809.5.
809 RESIDENTIAL DWELLING UNITS
809.1 GENERAL. RESIDENTIAL DWELLING UNITS SHALL COMPLY WITH 809.
RESIDENTIAL DWELLING UNITS REQUIRED TO PROVIDE MOBILITY FEATURES SHALL COMPLY WITH 809.2 THROUGH 809.4.
RESIDENTIAL DWELLING UNITS REQUIRED TO PROVIDE COMMUNICATION FEATURES SHALL COMPLY WITH 809.5.
809.5 RESIDENTIAL DWELLING UNITS WITH COMMUNICATION FEATURES. RESIDENTIAL DWELLING UNITS REQUIRED TO PROVIDE COMMUNICATION FEATURES SHALL COMPLY WITH 809.5.
809.5.1 BUILDING FIRE ALARM SYSTEM. WHERE A BUILDING FIRE ALARM SYSTEM IS PROVIDED, THE SYSTEM WIRING SHALL BE EXTENDED TO A POINT WITHIN THE RESIDENTIAL DWELLING UNIT IN THE VICINITY OF THE RESIDENTIAL DWELLING UNIT SMOKE DETECTION SYSTEM.
809.5.1.1 ALARM APPLIANCES. WHERE ALARM APPLIANCES ARE PROVIDED WITHIN A RESIDENTIAL DWELLING UNIT AS PART OF THE BUILDING FIRE ALARM SYSTEM, THEY SHALL COMPLY WITH 702.
809.5.1.2 ACTIVATION. ALL VISIBLE ALARM APPLIANCES PROVIDED WITHIN THE RESIDENTIAL DWELLING UNIT FOR BUILDING FIRE ALARM NOTIFICATION SHALL BE ACTIVATED UPON ACTIVATION OF THE BUILDING FIRE ALARM IN THE PORTION OF THE BUILDING CONTAINING THE RESIDENTIAL DWELLING UNIT.
809.5.2 RESIDENTIAL DWELLING UNIT SMOKE DETECTION SYSTEM. RESIDENTIAL DWELLING UNIT SMOKE DETECTION SYSTEMS SHALL COMPLY WITH NFPA 72 (1999 OR 2002 EDITION) (INCORPORATED BY REFERENCE, SEE "REFERENCED STANDARDS" IN CHAPTER 1).
809.5.2.1 ACTIVATION. ALL VISIBLE ALARM APPLIANCES PROVIDED WITHIN THE RESIDENTIAL DWELLING UNIT FOR SMOKE DETECTION NOTIFICATION SHALL BE ACTIVATED UPON SMOKE DETECTION.
809.5.3 INTERCONNECTION. THE SAME VISIBLE ALARM APPLIANCES SHALL BE PERMITTED TO PROVIDE NOTIFICATION OF RESIDENTIAL DWELLING UNIT SMOKE DETECTION AND BUILDING FIRE ALARM ACTIVATION.
809.5.5 RESIDENTIAL DWELLING UNIT PRIMARY ENTRANCE. COMMUNICATION FEATURES SHALL BE PROVIDED AT THE RESIDENTIAL DWELLING UNIT PRIMARY ENTRANCE COMPLYING WITH 809.5.5.
809.5.5.1 NOTIFICATION. A HARD-WIRED ELECTRIC DOORBELL SHALL BE PROVIDED. A BUTTON OR SWITCH SHALL BE PROVIDED OUTSIDE THE RESIDENTIAL DWELLING UNIT PRIMARY ENTRANCE. ACTIVATION OF THE BUTTON OR SWITCH SHALL INITIATE AN AUDIBLE TONE AND VISIBLE SIGNAL WITHIN THE RESIDENTIAL DWELLING UNIT. WHERE VISIBLE DOORBELL SIGNALS ARE LOCATED IN SLEEPING AREAS, THEY SHALL HAVE CONTROLS TO DEACTIVATE THE SIGNAL.
809.5.5.2 IDENTIFICATION. A MEANS FOR VISUALLY IDENTIFYING A VISITOR WITHOUT OPENING THE RESIDENTIAL DWELLING UNIT ENTRY DOOR SHALL BE PROVIDED AND SHALL ALLOW FOR A MINIMUM 180 DEGREE RANGE OF VIEW.
809.5.6 SITE, BUILDING, OR FLOOR ENTRANCE. WHERE A SYSTEM, INCLUDING A CLOSED-CIRCUIT SYSTEM, PERMITTING VOICE COMMUNICATION BETWEEN A VISITOR AND THE OCCUPANT OF THE RESIDENTIAL DWELLING UNIT IS PROVIDED, THE SYSTEM SHALL COMPLY WITH 708.4.
708 TWO-WAY COMMUNICATION SYSTEMS
708.1 GENERAL. TWO-WAY COMMUNICATION SYSTEMS SHALL COMPLY WITH 708.
708.2 AUDIBLE AND VISUAL INDICATORS. THE SYSTEM SHALL PROVIDE BOTH AUDIBLE AND VISUAL SIGNALS.
708.3 HANDSETS. HANDSET CORDS, IF PROVIDED, SHALL BE 29 INCHES (735 MM) LONG MINIMUM.
708.4 RESIDENTIAL DWELLING UNIT COMMUNICATION SYSTEMS. COMMUNICATIONS SYSTEMS BETWEEN A RESIDENTIAL DWELLING UNIT AND A SITE, BUILDING, OR FLOOR ENTRANCE SHALL COMPLY WITH 708.4.
708.4.1 COMMON USE OR PUBLIC USE SYSTEM INTERFACE. THE COMMON USE OR PUBLIC USE SYSTEM INTERFACE SHALL INCLUDE THE CAPABILITY OF SUPPORTING VOICE AND TTY COMMUNICATION WITH THE RESIDENTIAL DWELLING UNIT INTERFACE.
708.4.2 RESIDENTIAL DWELLING UNIT INTERFACE. THE RESIDENTIAL DWELLING UNIT SYSTEM INTERFACE SHALL INCLUDE A TELEPHONE JACK CAPABLE OF SUPPORTING VOICE AND TTY COMMUNICATION WITH THE COMMON USE OR PUBLIC USE SYSTEM INTERFACE.

ADDITIONAL DATA:
THE PROJECT CONTAINS 29043.41SQUARE FEET OF TOTAL RESIDENTIAL FLOOR AREA.;
THE PROJECT CONTAINS 5026.50 SQUARE FEET OF FLOOR AREA ATTRIBUTED TO DWELLING UNITS DESIGNATED FOR AFFORDABLE HOUSING TO BE OCCUPIED BY LOW INCOME HOUSEHOLDS. FOR EACH SEPARATE AFFORDABLE HOUSING DWELLING UNIT TO BE OCCUPIED BY LOW INCOME HOUSEHOLDS:
- SUCH MEASUREMENT INCLUDES THE SQUARE FOOTAGE WITHIN THE INSIDE FACE OF THE WALLS ENCLOSING SUCH DWELLING UNIT (I.E., ALL FLOOR SURFACES WITHIN THE DWELLING UNIT, INCLUDING CLOSETS, AND THE PARTITIONS THAT SEPARATE ROOMS THAT ARE WITHIN THE SAME DWELLING UNIT).
- SUCH MEASUREMENT EXCLUDES (A) THE THICKNESS OF EXTERIOR WALLS, (B) THE THICKNESS OF PARTITIONS SEPARATING SUCH DWELLING UNIT FROM ANY OTHER DWELLING UNITS OR OTHER SPACES, AND (C) PORTIONS OF SUCH DWELLING UNIT THAT DO NOT QUALIFY AS FLOOR AREA.

THE PROJECT CONTAINS 18253.30 SQUARE FEET OF TOTAL FLOOR AREA ATTRIBUTED TO DWELLING UNITS NOT DESIGNATED FOR AFFORDABLE HOUSING TO BE OCCUPIED BY LOW INCOME HOUSEHOLDS. FOR EACH SEPARATE DWELLING UNIT NOT DESIGNATED FOR AFFORDABLE HOUSING TO BE OCCUPIED BY LOW INCOME HOUSEHOLDS:
- SUCH MEASUREMENT INCLUDES THE SQUARE FOOTAGE WITHIN THE INSIDE FACE OF THE WALLS ENCLOSING SUCH DWELLING UNIT (I.E., ALL FLOOR SURFACES WITHIN THE DWELLING UNIT, INCLUDING CLOSETS, AND THE PARTITIONS THAT SEPARATE ROOMS THAT ARE WITHIN THE SAME DWELLING UNIT).
- SUCH MEASUREMENT EXCLUDES (A) THE THICKNESS OF EXTERIOR WALLS, (B) THE THICKNESS OF PARTITIONS SEPARATING SUCH DWELLING UNIT FROM ANY OTHER DWELLING UNITS OR OTHER SPACES, AND (C) PORTIONS OF SUCH DWELLING UNIT THAT DO NOT QUALIFY AS FLOOR AREA.

THE PROJECT CONTAINS 0 SQUARE FEET OF TOTAL FLOOR AREA ATTRIBUTED TO COMMON AREAS IN THE BUILDING FOR WHICH A USER FEE IS CHARGED TO RESIDENTS OF AFFORDABLE HOUSING UNITS FOR THEIR USE (INCLUDING, BUT NOT LIMITED TO, HEALTH CLUBS, POOLS, AND PARTY ROOMS).
- SUCH MEASUREMENT INCLUDES THE SQUARE FOOTAGE WITHIN THE INSIDE FACE OF THE WALLS ENCLOSING EACH SUCH SEPARATE COMMON AREA (I.E., ALL FLOOR SURFACES WITHIN SUCH COMMON AREA, INCLUDING CLOSETS, AND THE PARTITIONS THAT SEPARATE ROOMS THAT ARE WITHIN THE SAME SUCH COMMON AREA).
- SUCH MEASUREMENT EXCLUDES (A) THE THICKNESS OF EXTERIOR WALLS, (B) THE THICKNESS OF PARTITIONS SEPARATING SUCH COMMON AREA FROM DWELLING UNITS OR OTHER SPACES, AND (C) PORTIONS OF SUCH COMMON AREA THAT DO NOT QUALIFY AS FLOOR AREA.

THE PROJECT CONTAINS 5240.7 SQUARE FEET OF TOTAL FLOOR AREA DEVOTED TO AFFORDABLE HOUSING TO BE OCCUPIED BY LOW INCOME HOUSEHOLDS.

ARCHITECT/ENGENEER SHALL NOT HAVE CONTROL, CHARGE OF AND NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, DEVIATIONS, TECHNIQUES, SEQUENCES, PROCEDURES, SAFETY PRECAUTIONS AND/OR PROGRAMS IN CONNECTION WITH THE WORK, ACTS, OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS OR ANY OTHER PERSON PERFORMING ANY OF THE WORK, AND/OR FOR FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO HIRE PRIOR TO COMMENCEMENT OF ANY WORK AN INDEPENDENT ARCHITECT/ ENGINEER TO PERFORM CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE NYC BUILDING CODE. THE ARCHITECT / ENGINEER PERFORMING THE CONTROL INSPECTIONS SHALL INSPECT THE SITE TO INSURE THE SAFETY OF THE SITE, QUALITY OF WORK, COMPLIANCE TO NYC BUILDING CODE, ZONING RESOLUTION, AND / OR ANY APPLICABLE CODE IN ACCORDANCE WITH CONTRACT DOCUMENTS. THE ARCHITECT/ENGINEER, PERFORMING CONTROL INSPECTIONS SHALL SUBMIT THE CONTROL INSPECTIONS, PROGRESS REPORT AND ALL FINDINGS OF THE WORKSITE TO THE DEPARTMENT OF BUILDINGS.

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SEAL

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Professional Certification
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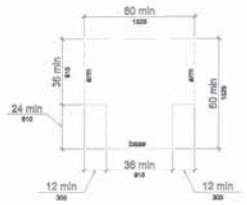
HANDICAP CODE

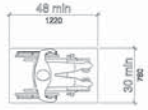
DWG No
G-003.00

PAGE:

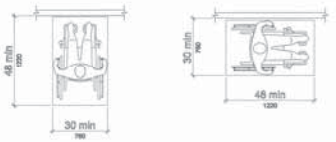
THE IMPLEMENTATION OF THESE DRAWINGS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BRING TO ARCHITECT'S ATTENTION IN WRITING ANY DISCREPANCIES IN THESE PLANS. THE CONTRACTOR SHALL SUBMIT TO ARCHITECT FOR APPROVAL ALL SHOP DRAWINGS AND SPECIFICATIONS RELATED TO THIS PROJECT.



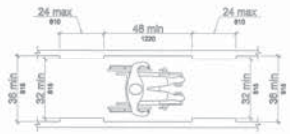
T-SHAPE TURNING SPACE
ICC A117.1 CHAPTER 304



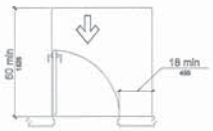
CLEAR FLOOR SPACE
ICC A117.1 CHAPTER 305



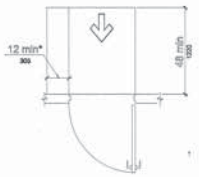
POSITION OF CLEAR FLOOR SPACE
ICC A117.1 CHAPTER 305



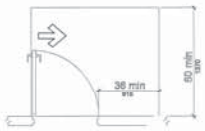
CLEAR WIDTH OF ACCESSIBLE ROUTE
ICC A117.1 CHAPTER 403



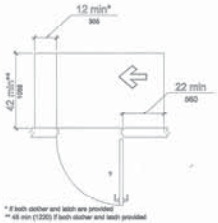
(a) Front Approach, Pull Side



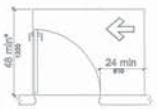
* If both slather and latch are provided
(b) Front Approach, Push Side



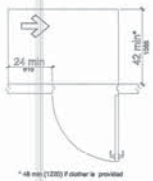
(c) Hinge Approach, Pull Side



* If both slather and latch are provided
** 48 min (1220) if both slather and latch provided
(d) Hinge Approach, Push Side



* 54 min (1370) slather is provided
(f) Latch Approach, Pull Side

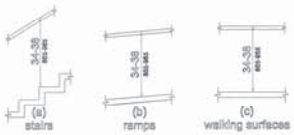


* 48 min (1220) if slather is provided
(e) Latch Approach, Push Side

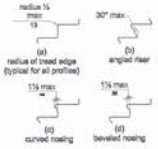
MANEURING CLEARANCE AT MANUAL SWING DOORS
ICC A117.1 CHAPTER 404

(a) hinged door (b) sliding door

CLEAR WIDTH OF DOORWAYS



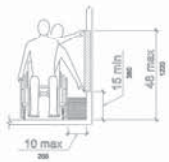
HANDRAIL HEIGHT
ICC A117.1 CHAPTER 505



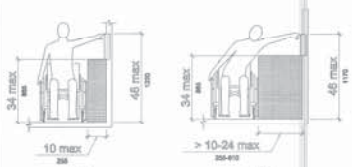
STAIR NOSINGS
ICC A117.1 CHAPTER 504

HANDRAIL CLEARANCE

HORIZONTAL PROJECTIONS
BELOW GRIPPING SURFACE
ICC A117.1 CHAPTER 505

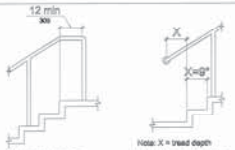


UNOBSTRUCTED SIDE REACH
ICC A117.1 CHAPTER 308

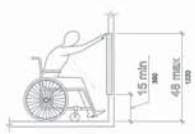


OBSTRUCTED HIGH SIDE REACH
ICC A117.1 CHAPTER 308

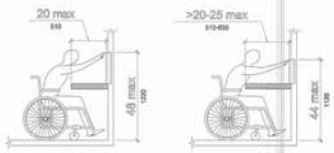
TOE CLEARANCE
ICC A117.1 CHAPTER 306



TOP HANDRAIL AND BOTTOM EXTENSION AT STAIRS
ICC A117.1 CHAPTER 505



OBSTRUCTED FORWARD REACH
ICC A117.1 CHAPTER 308



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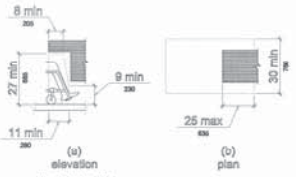
ICC A117.1 CHAPTER 308



KNEE CLEARANCE
ICC A117.1 CHAPTER 306

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HANDICAP DETAILS

DWG No:
G-004.00

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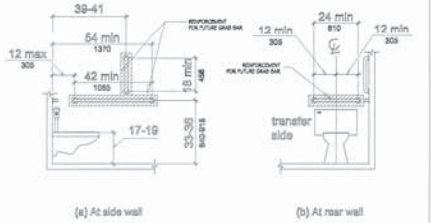
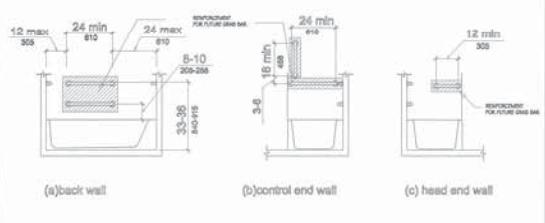
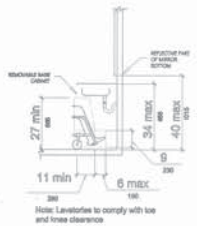


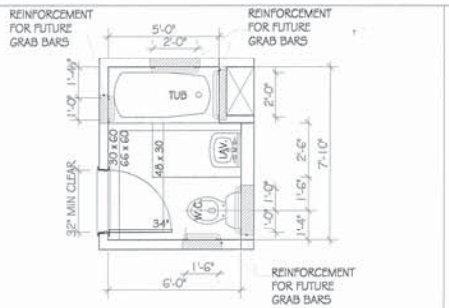
GRAB BAR AND REINFORCEMENT AT WATER CLOSET
AS PER ICC A117.1
ICC A117.1 CHAPTER 604



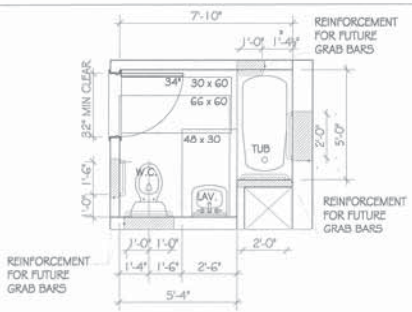
GRAB BAR AND REINFORCEMENT FOR BATHTUBS WITH REMOVABLE IN-TUB SEATS
ICC A117.1 CHAPTER 607



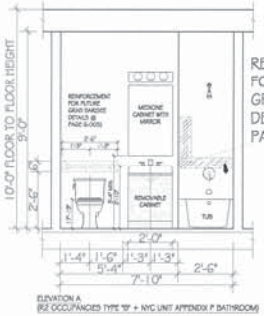
LAVATORY HEIGHT AND CLEARENCE
ICC A117.1 CHAPTER 606



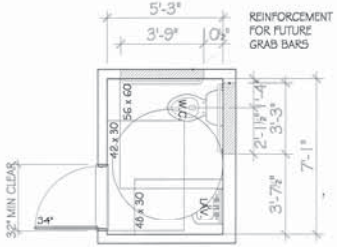
H/C BATHROOM TYPE "B + NYC"

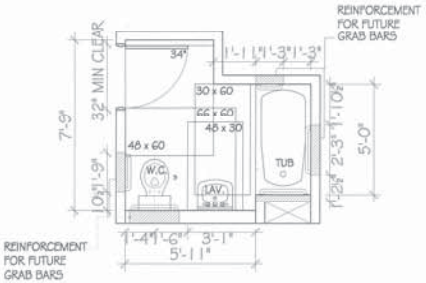


H/C BATHROOM TYPE "B + NYC"



ELEVATION A
(R2 OCCUPANCIES TYPE "B" + NYC UNIT APPENDIX F BATHROOM)





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DWG No.
G-005.00

DEPT BLDGS Job No. 310131675
Appl. # 520150150R2

PAID:

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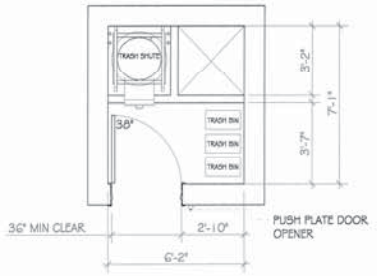
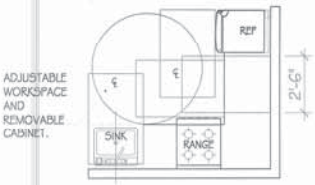
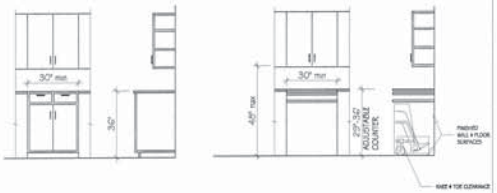


REFUSE DISPOSAL ROOM

KITCHEN



KITCHEN

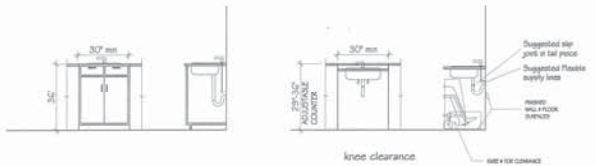


(a) Before Removal of cabinet and base

(b) Cabinets and base Removed and Height Alternatives

ADJUSTABLE WORK SURFACE

ICC A117.1 CHAPTER 604



(a) Before Removal of cabinet and base

(b) Cabinets and base Removed and Height Alternatives

ADJUSTABLE KITCHEN SINK

ICC A117.1 CHAPTER 604

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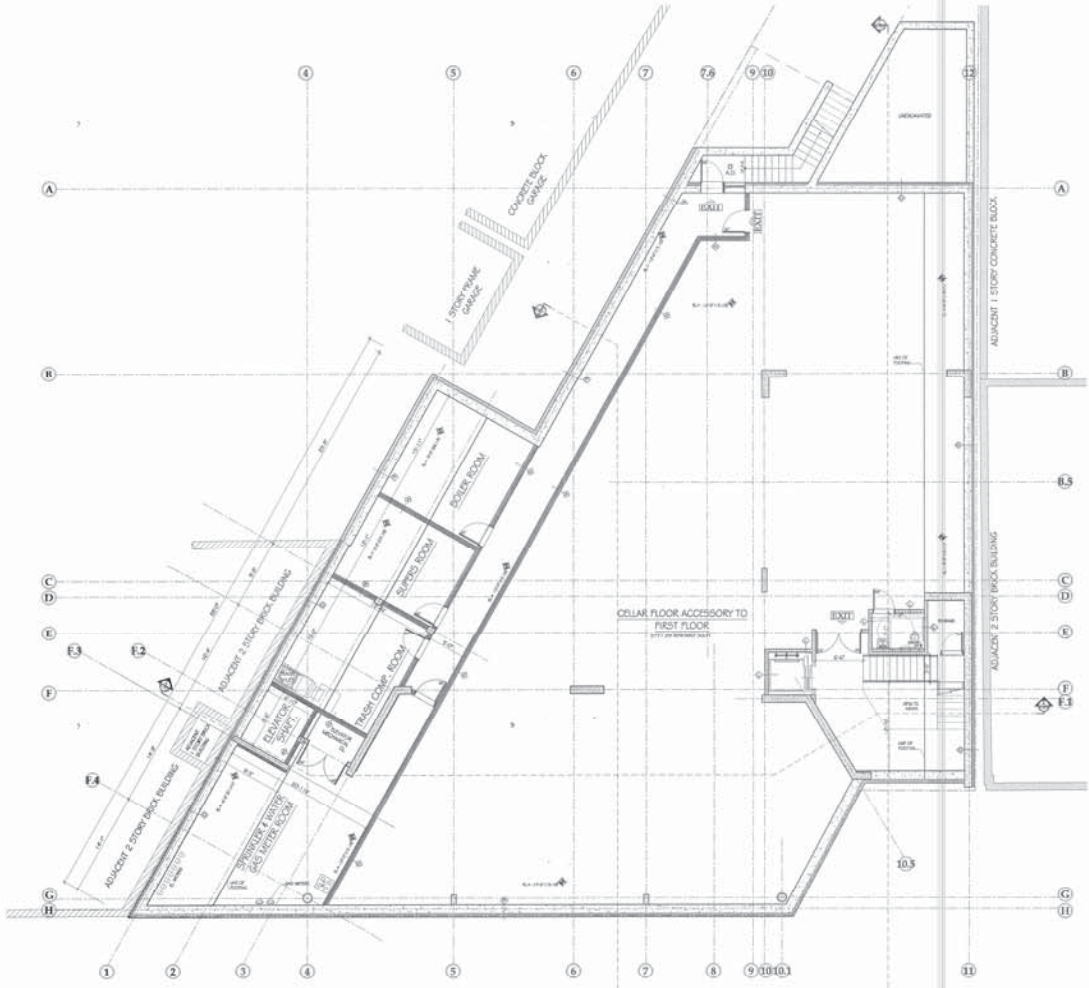

CELLAR FLOOR PLAN (7836.93 GROSS SQ.FT.)

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

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CELLAR
FLOOR PLAN

DWG No.
A-001.00

SEPT 2015 Job No. 310131675
Scan Code 83H00083735

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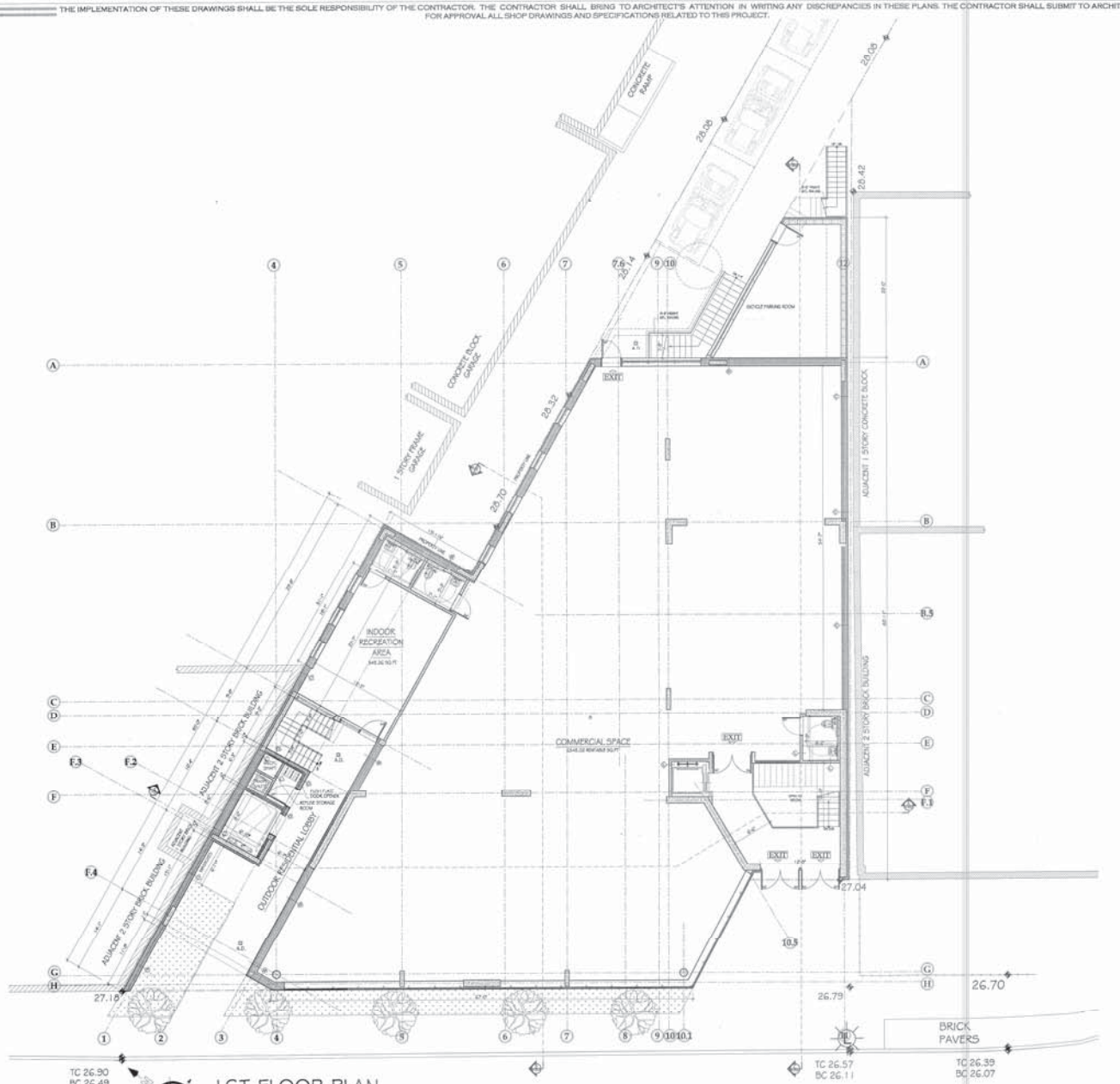

1 ST FLOOR PLAN

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

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1ST
FLOOR PLAN

DWG No:
A-002.00

HPP Build Job No. 310131675
Scan Code 55H5060403

PAGE:

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2ND FLOOR PLAN

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

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PROJECT ADDRESS
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2ND
FLOOR PLAN

DWG No.
A-003.00

JOB# 30000 Job No: 310151075
Scan Code: 310151075A1

PAGE:

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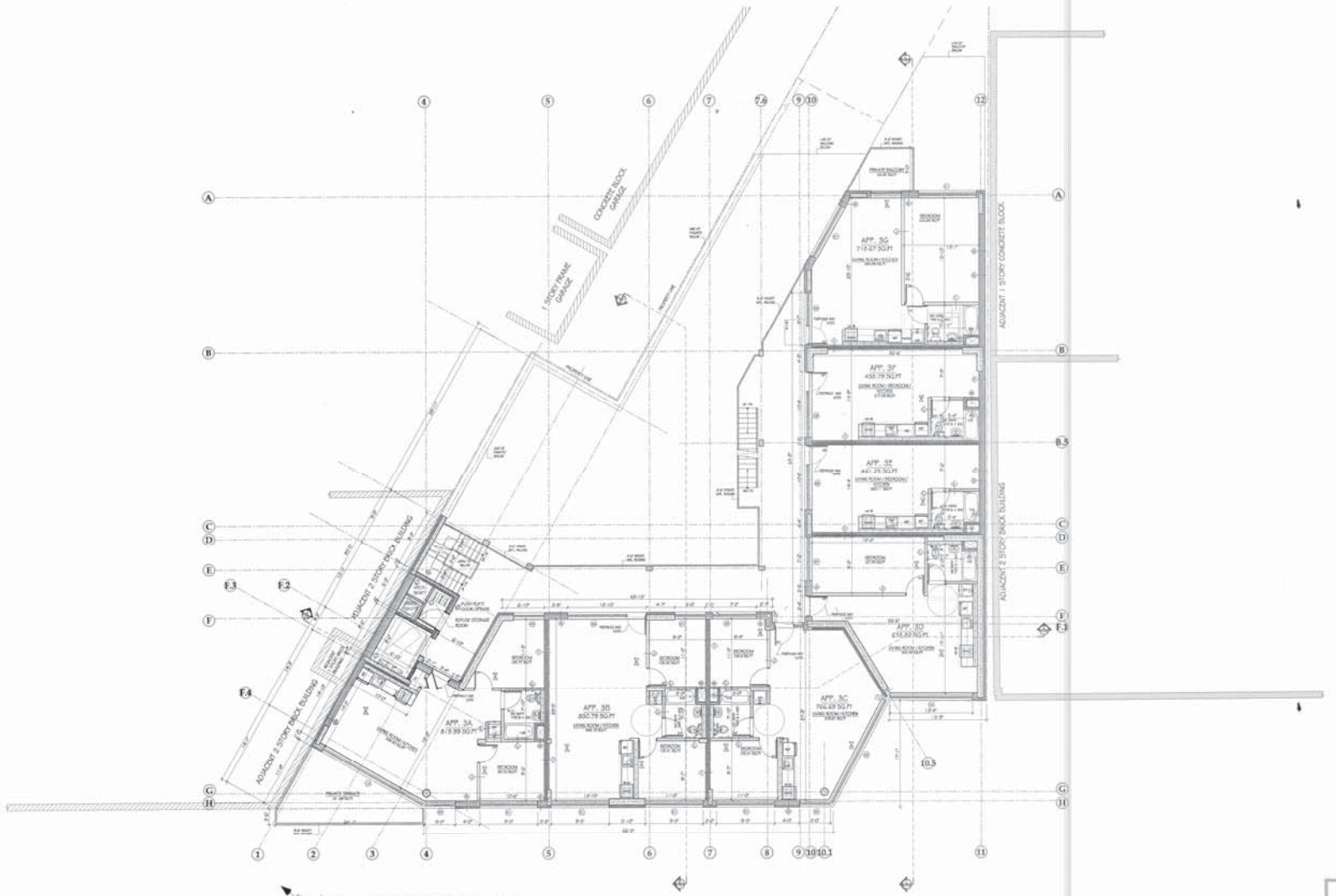

3RD FLOOR PLAN

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

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BROOKLYN, NY

3RD
FLOOR PLAN

DWG No
A-004.00

BDP BOROUGH Job No. 310114075
Permit Code E0945745C00

PERMIT

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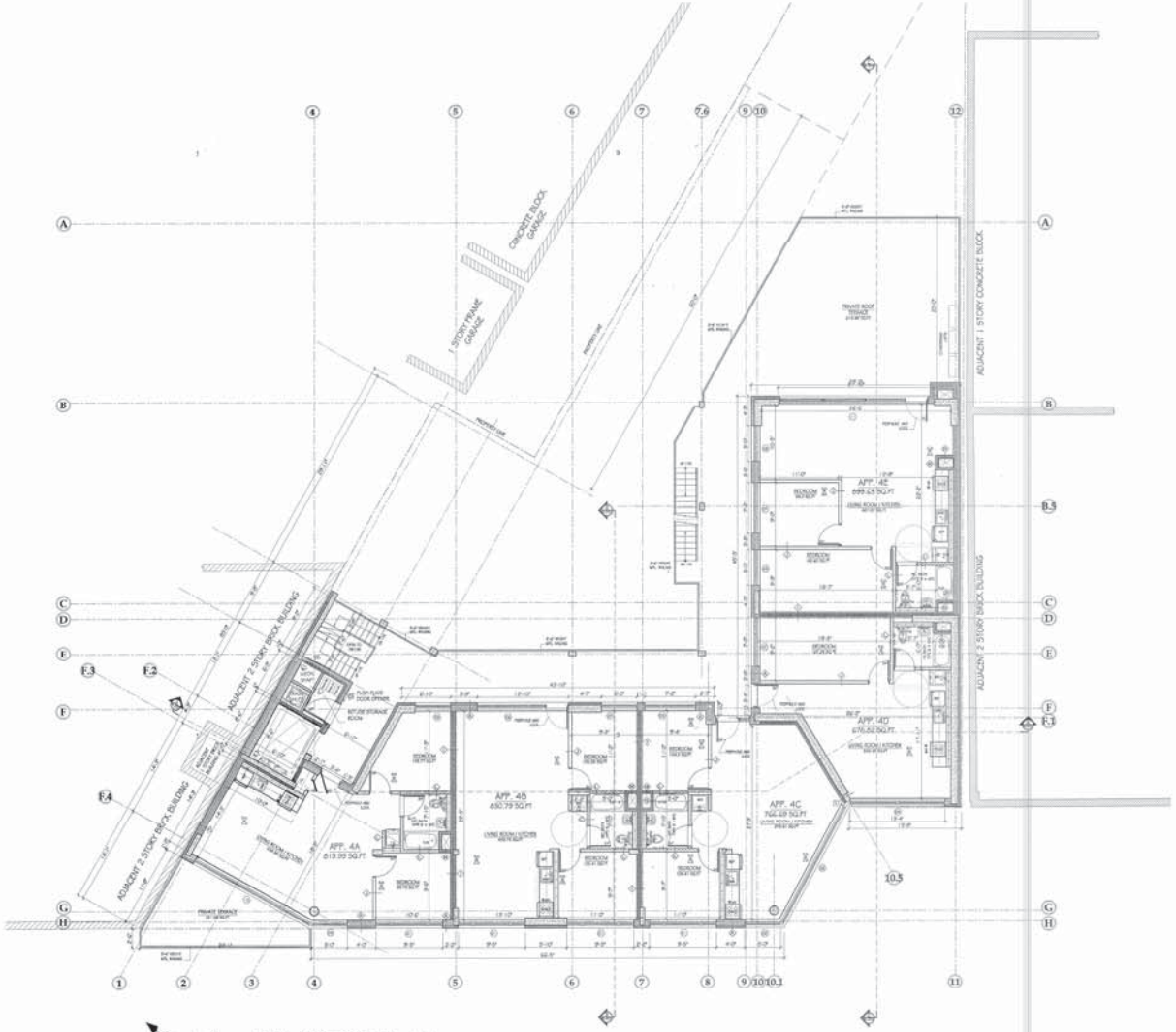

4TH FLOOR PLAN

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

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4TH
FLOOR PLAN

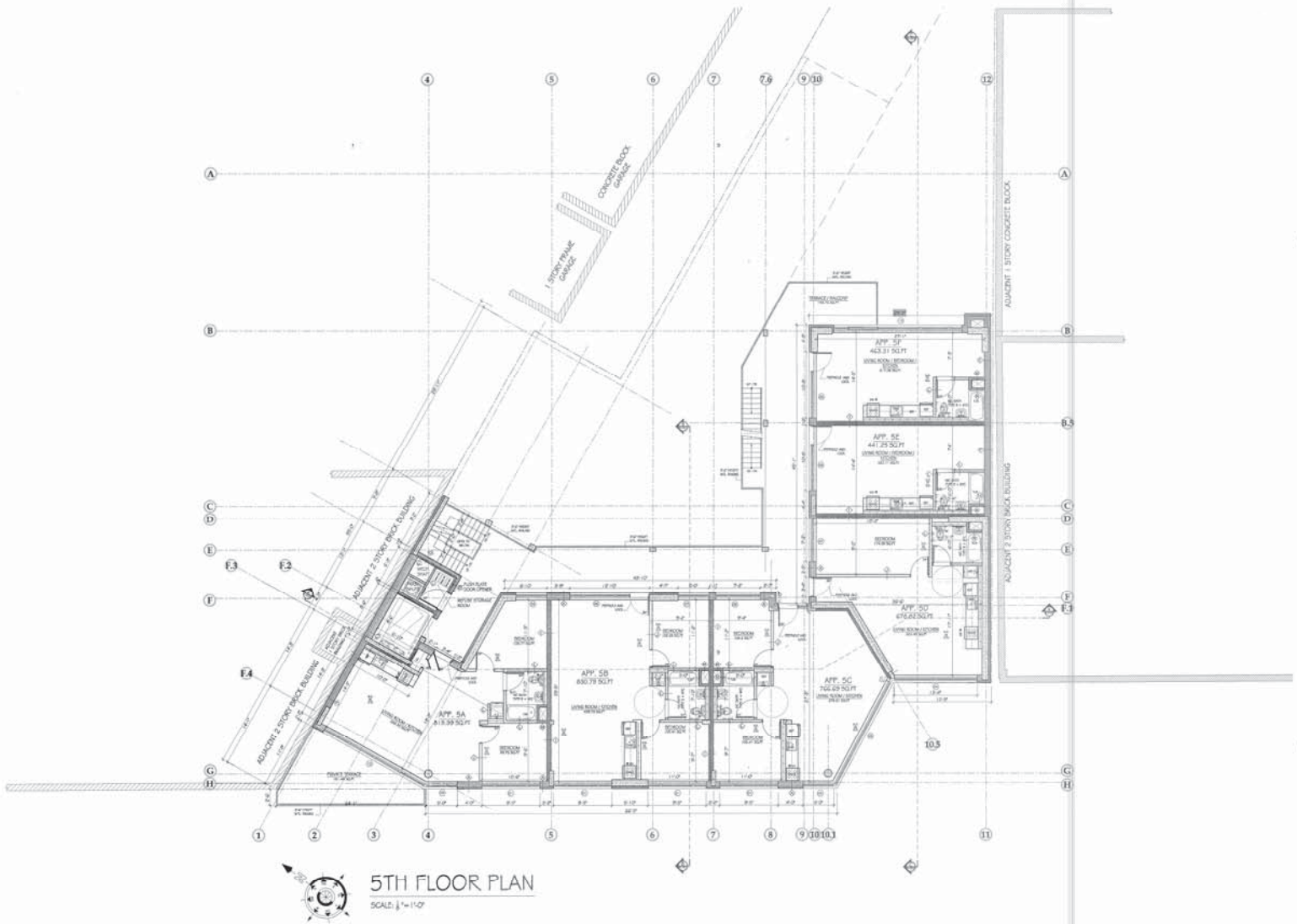
DWG No.
A-005.00

DEPT. BLDGS Job No. 310131675
Scan Code ESH54779647

PAGE:

ARCHITECT/ENGENEER SHALL NOT HAVE CONTROL, CHARGE OF AND NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, DEVIATIONS, TECHNIQUES, SEQUENCES, PROCEDURES, SAFETY PRECAUTIONS AND/OR PROGRAMS IN CONNECTION WITH THE WORK, ACTS, OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS OR ANY OTHER PERSON PERFORMING ANY OF THE WORK, AND/OR FOR FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO HIRE PRIOR TO COMMENCEMENT OF ANY WORK AN INDEPENDENT ARCHITECT/ENGINEER TO PERFORM CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE NYC BUILDING CODE. THE ARCHITECT / ENGINEER PERFORMING THE CONTROL INSPECTIONS SHALL INSPECT THE SITE TO INSURE THE SAFETY OF THE SITE, QUALITY OF WORK, COMPLIANCE TO NYC BUILDING CODE, ZONING RESOLUTION, AND / OR ANY APPLICABLE CODE IN ACCORDANCE WITH CONTRACT DOCUMENTS. THE ARCHITECT/ENGINEER, PERFORMING CONTROL INSPECTIONS SHALL SUBMIT THE CONTROL INSPECTIONS, PROGRESS REPORT AND ALL FINDINGS OF THE WORKSITE TO THE DEPARTMENT OF BUILDINGS.

THE IMPLEMENTATION OF THESE DRAWINGS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BRING TO ARCHITECT'S ATTENTION IN WRITING ANY DISCREPANCIES IN THESE PLANS. THE CONTRACTOR SHALL SUBMIT TO ARCHITECT FOR APPROVAL ALL SHOP DRAWINGS AND SPECIFICATIONS RELATED TO THIS PROJECT.



5TH FLOOR PLAN

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

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SEAL

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BROOKLYN
Date: DEC 23 2015

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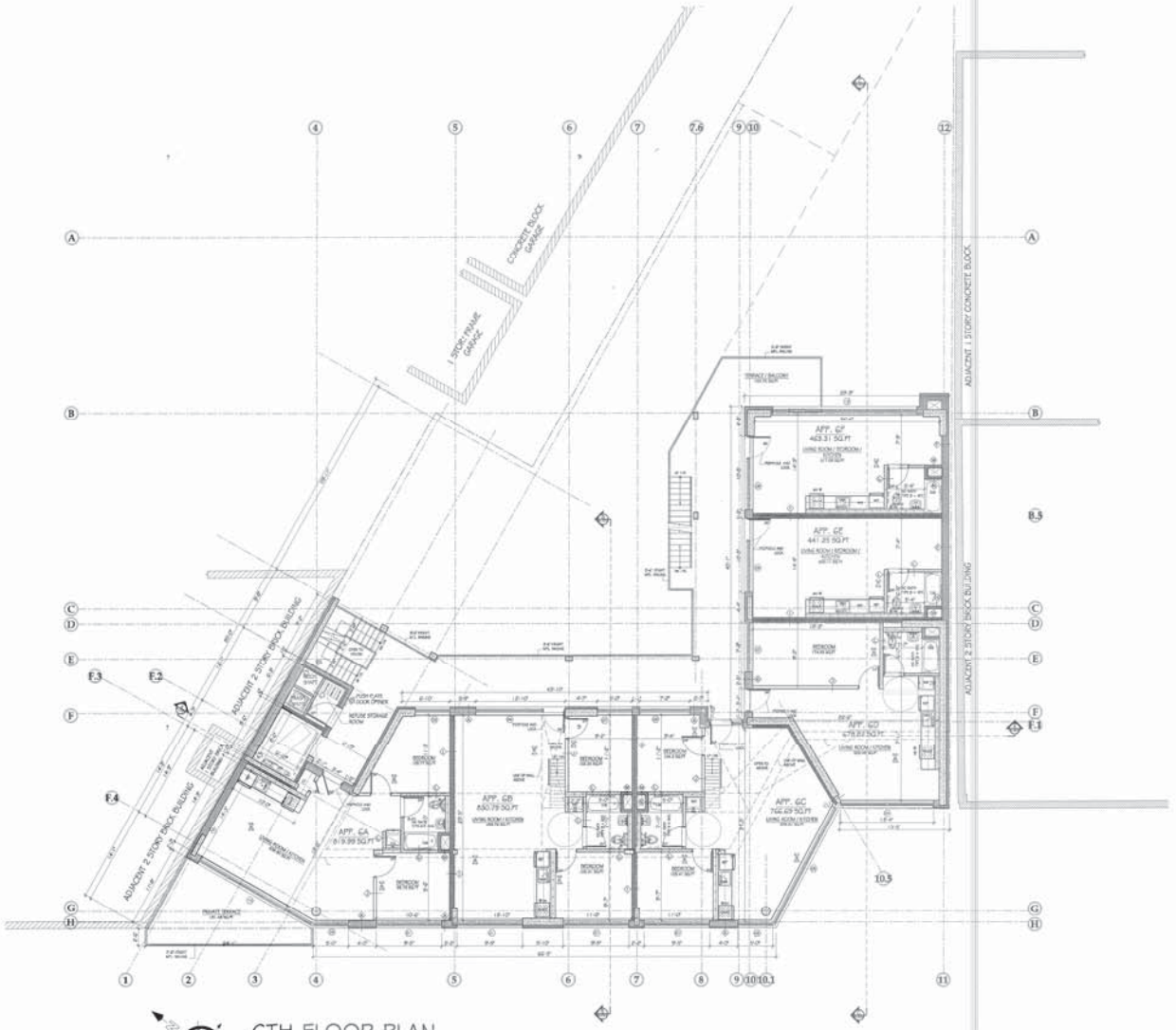
PROJECT ADDRESS:
1353
FLATBUSH AVENUE
BROOKLYN, NY

5TH
FLOOR PLAN

DWG No
A-006.00

DEP BOOO Job No 310131670
Work Type EW-REQUEST
PAID

THE IMPLEMENTATION OF THESE DRAWINGS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BRING TO ARCHITECT'S ATTENTION IN WRITING ANY DISCREPANCIES IN THESE PLANS. THE CONTRACTOR SHALL SUBMIT TO ARCHITECT FOR APPROVAL ALL SHOP DRAWINGS AND SPECIFICATIONS RELATED TO THIS PROJECT.



6TH FLOOR PLAN

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

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6TH
FLOOR PLAN

DWG No.
A-007.00

DEPT BLDGS Job No. 310131675
Scan Code E3H67008438

PAGE:

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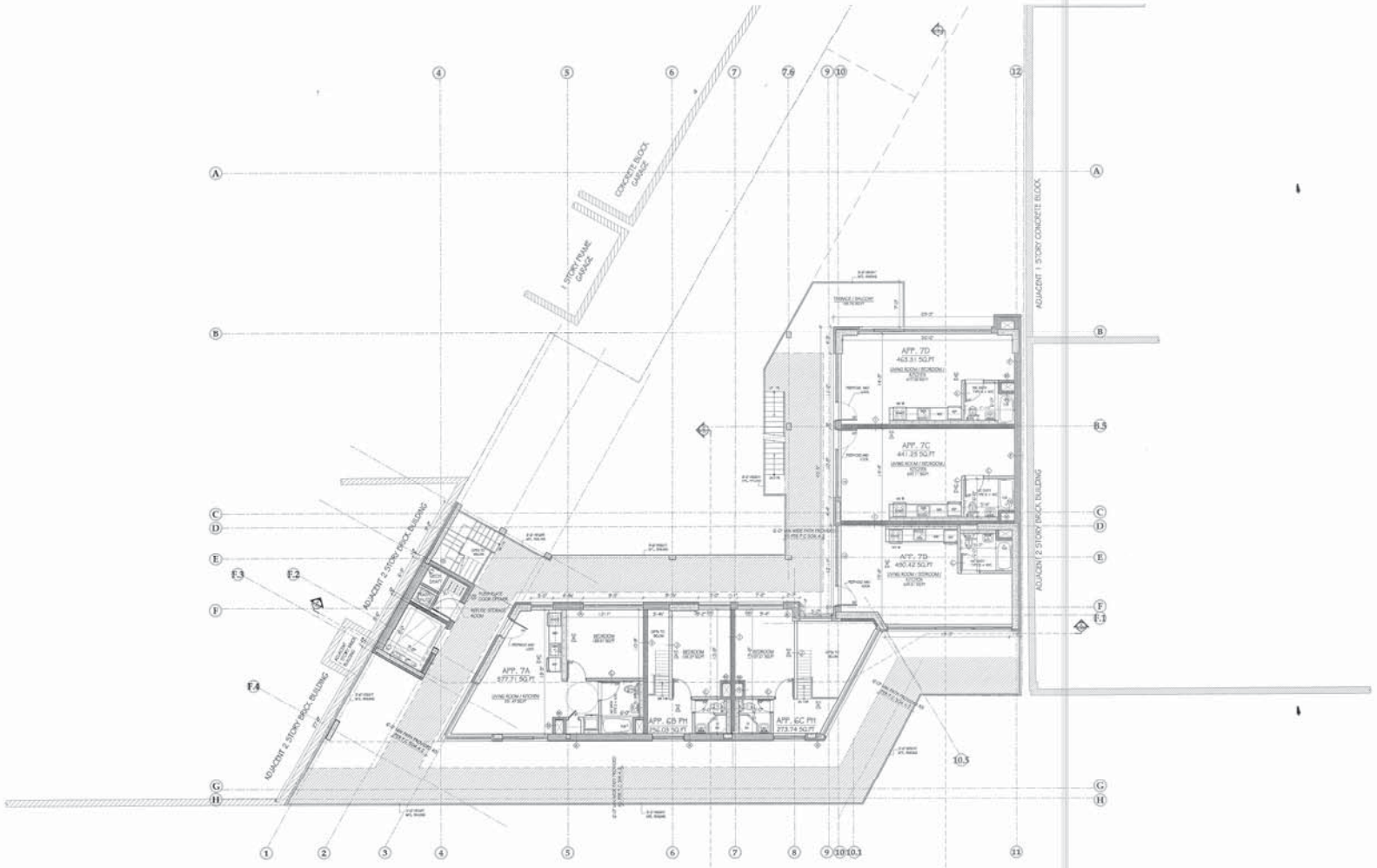

7TH / PENTHOUSE FLOOR PLAN

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

ARCHITECT/ENGENEER SHALL NOT HAVE CONTROL, CHARGE OF AND NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, DEVIATIONS, TECHNIQUES, SEQUENCES, PROCEDURES, SAFETY PRECAUTIONS AND/OR PROGRAMS IN CONNECTION WITH THE WORK, ACTS, OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS OR ANY OTHER PERSON PERFORMING ANY OF THE WORK, AND/OR FOR FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO HIRE PRIOR TO COMMENCEMENT OF ANY WORK AN INDEPENDENT ARCHITECT/ ENGINEER TO PERFORM CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE NYC BUILDING CODE. THE ARCHITECT / ENGINEER PERFORMING THE CONTROL INSPECTIONS SHALL INSPECT THE SITE TO INSURE THE SAFETY OF THE SITE, QUALITY OF WORK, COMPLIANCE TO NYC BUILDING CODE, ZONING RESOLUTION, AND / OR ANY APPLICABLE CODE IN ACCORDANCE WITH CONTRACT DOCUMENTS. THE ARCHITECT/ENGINEER, PERFORMING CONTROL INSPECTIONS SHALL SUBMIT THE CONTROL INSPECTIONS, PROGRESS REPORT AND ALL FINDINGS OF THE WORKSITE TO THE DEPARTMENT OF BUILDINGS.

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7TH / PENTHOUSE FLOOR PLAN

DWG No.
A-008.00

JOB NUMBER Job No. 310111675
Form Code 3104411800

PAGE:

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ROOF FLOOR PLAN

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

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SEAL

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BROOKLYN, NY

ROOF
FLOOR PLAN

DWG No
A-009.00

DEPT BLDGS Job No 310115075
Scan Date 12/4/2015
PAGE

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FRONT ELEVATION

SCALE: $\frac{3}{16}$"= 1'-0"

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PROJECT ADDRESS:
1353
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BROOKLYN, NY

FRONT
ELEVATION

DWG No.
A-100.00

DOB BLOCK JOB No. 310111675
Exam Date 12/4/2015 8:00:00 AM

PAGE

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REAR ELEVATION

SCALE: $\frac{3}{16}$"= 1'-0"

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REAR ELEVATION

DWG No
A-101.00

DEPT BLDGS JOB No. 310131675
Scan Code
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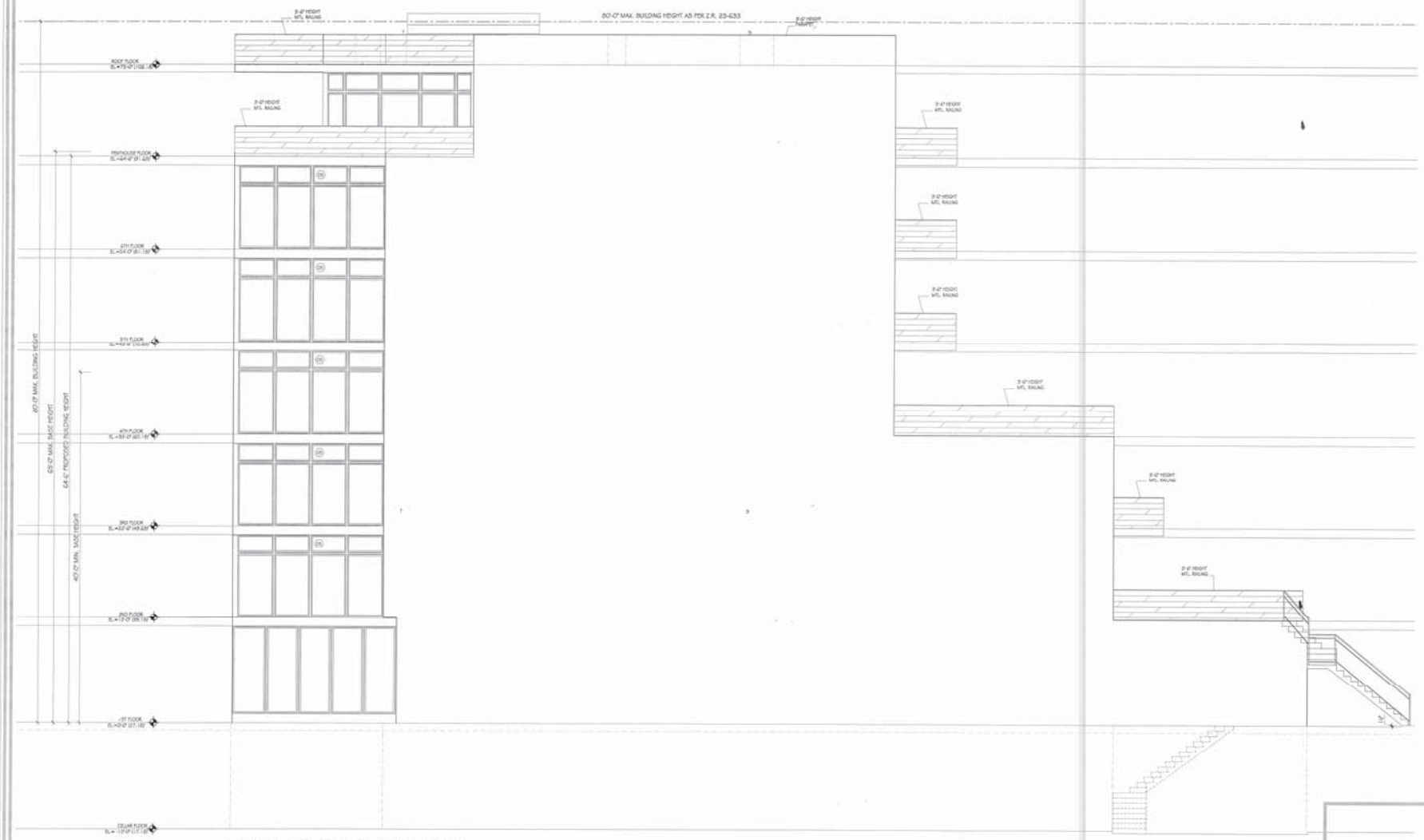

RIGHT ELEVATION

SCALE: $\frac{3}{32}$" = 1'-0"

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Date: DEC 23 2015

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RIGHT
ELEVATION

DWG No.
A-102.00

DOB# 310133070 Job No. 310133070
Filed Code: ESHO1001X

PAGE:

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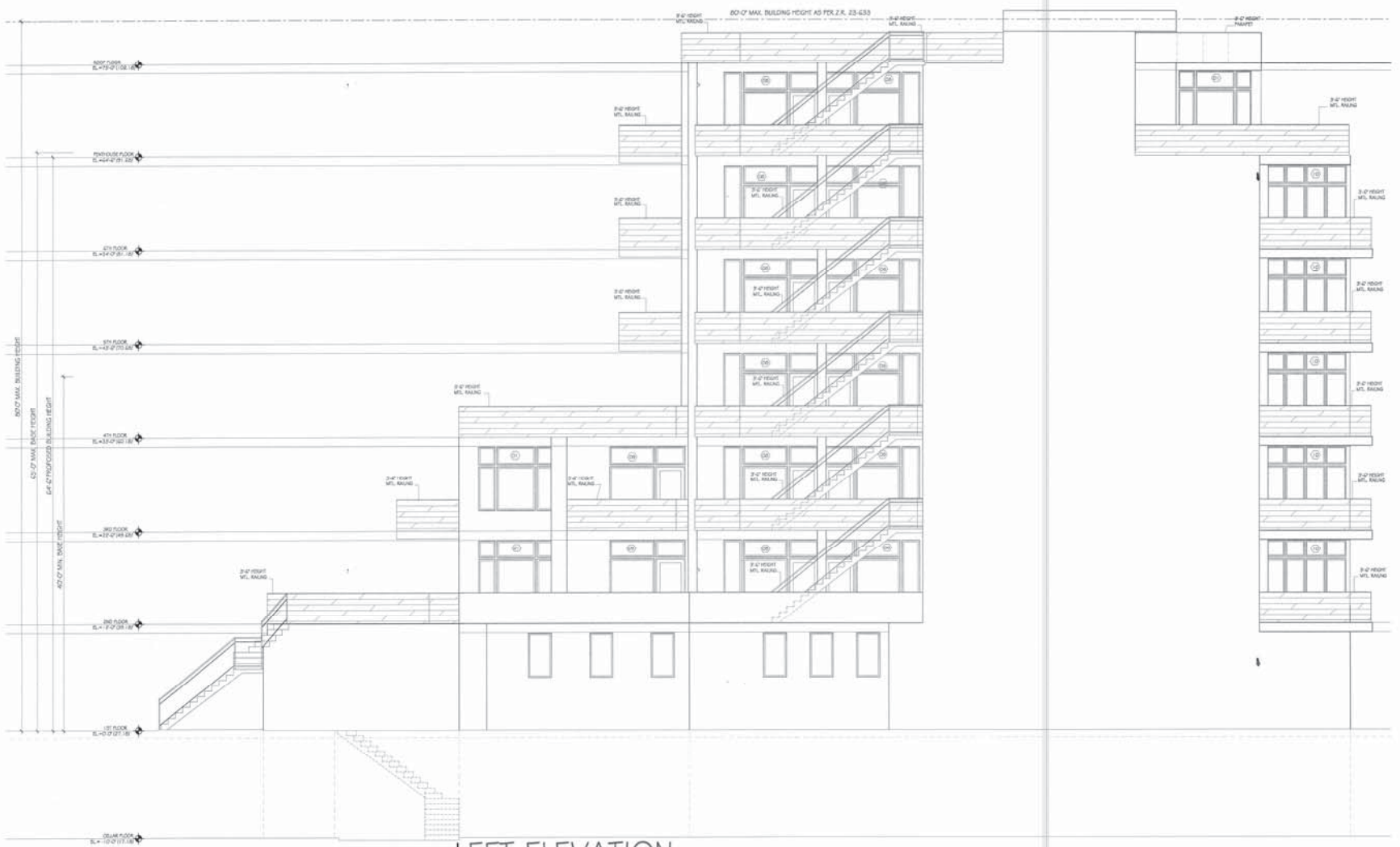

LEFT ELEVATION

SCALE: $\frac{3}{16}$" = 1'-0"

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PROJECT ADDRESS:
1353
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BROOKLYN, NY

LEFT
ELEVATION

DWG No
A-103.00

PAGE:

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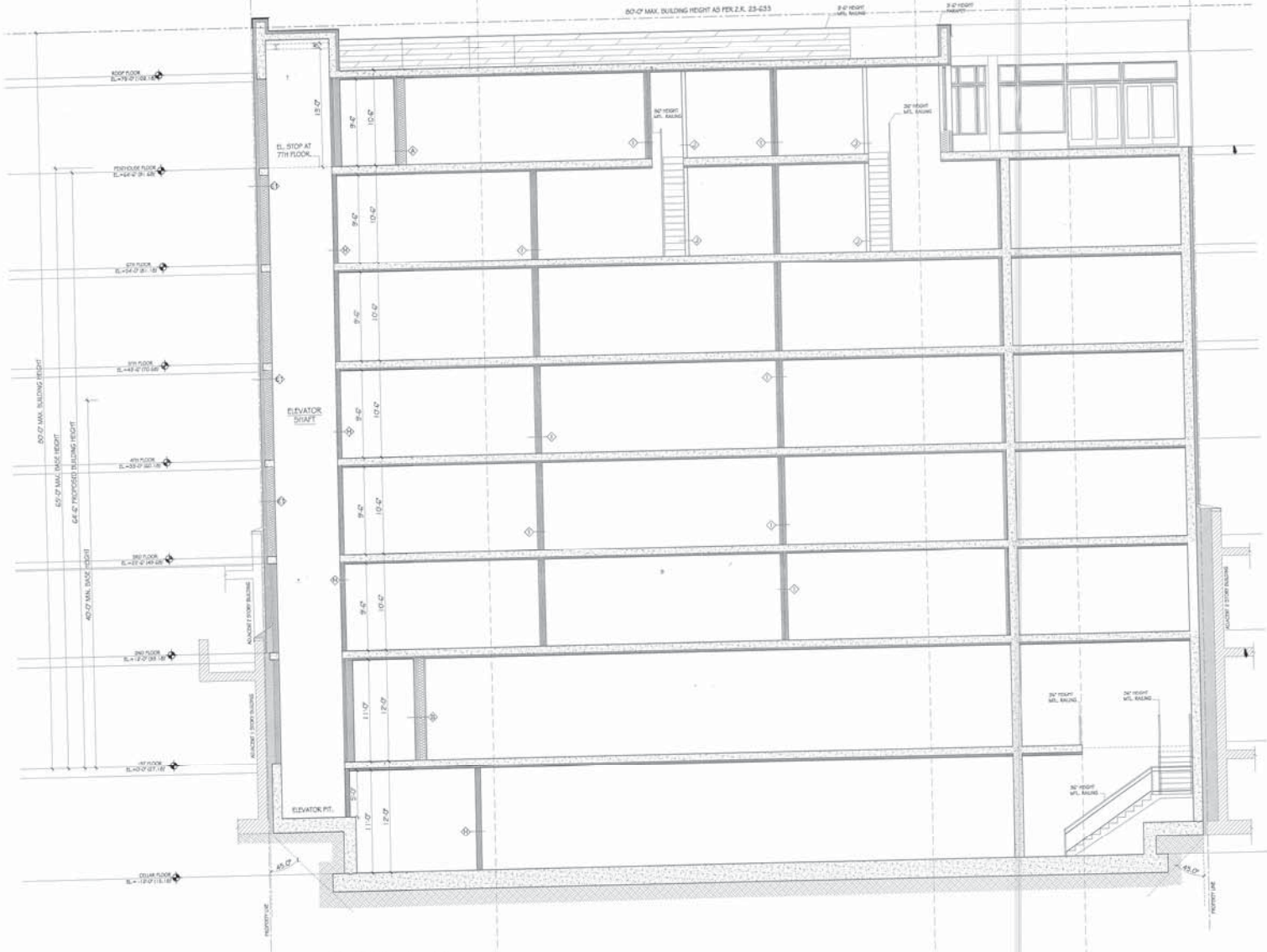

SECTION A-A

SCALE: $\frac{3}{16}$" = 1'-0"

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Date: DEC 2 9 2015

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SECTION A-A

DRAWING No.
A-200.00

DEPT. BLDGS Job No. 310131675
Doc. No. 01
PAID:

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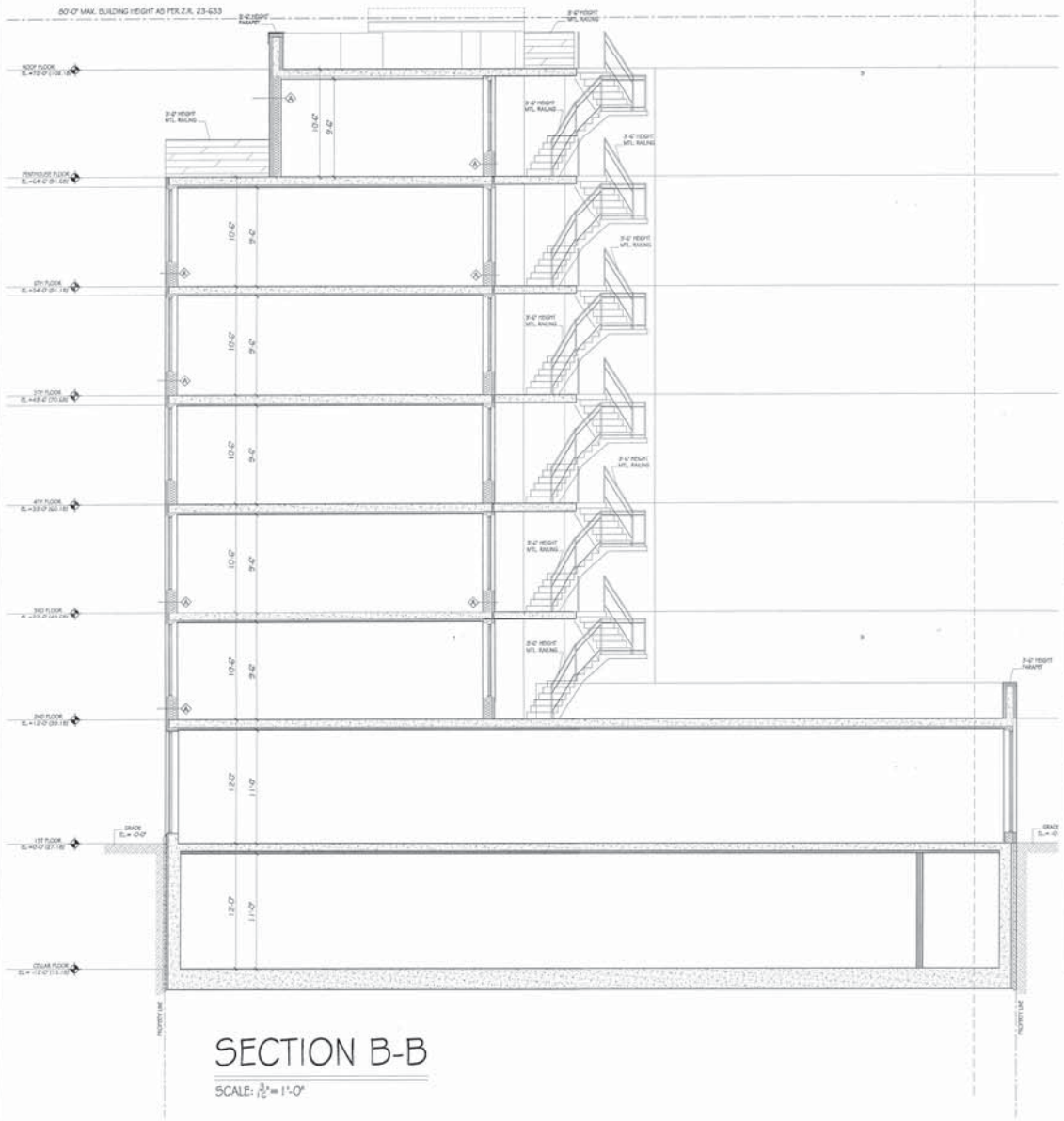

SECTION B-B

SCALE: $\frac{1}{16}$" = 1'-0"

WINDOW SCHEDULE

ID	QUANTITY	UNIT DIMENSIONS	ROUGH OPENING	FRAME TYPE	USAGE AND AIR CALCULATIONS	GLAZING	GLAZING	U-FACTOR	SHGC	SOUND RATING	FIRE RATING	SAFETY GLAZING CATEGORY	NOTES
01	20	5'-6 1/8" x 7'-0"	5'-6 1/8" x 7'-4"			TRIPLE GLAZED		0.14		STC 47		CAT. II	
02	10	4'-11 7/8" x 8'-1 7/8"	5'-1 7/8" x 8'-5 7/8"			TRIPLE GLAZED		0.14		STC 47		CAT. II	
03	10	4'-11 7/8" x 7'-1 7/8"	5'-1 7/8" x 7'-5 7/8"			TRIPLE GLAZED		0.14		STC 47		CAT. II	
04	05	13'-5 7/8" x 8'-1 7/8"	13'-5 7/8" x 8'-5 7/8"			TRIPLE GLAZED		0.14		STC 47		CAT. II	
05	01	1'-9 7/8" x 5'-1 7/8"	2'-1 7/8" x 5'-5 7/8"			TRIPLE GLAZED		0.14		STC 47		CAT. II	
06	06	7'-2" x 8'-1 7/8"	7'-6" x 8'-5 7/8"			TRIPLE GLAZED		0.14		STC 47		CAT. II	
07	03	13'-10 7/8" x 7'-1 7/8"	14'-2 7/8" x 7'-5 7/8"			TRIPLE GLAZED		0.14		STC 47		CAT. II	
08	18	7'-2" x 8'-1 7/8"	7'-6" x 8'-5 7/8"			TRIPLE GLAZED		0.14		STC 47		CAT. II	
09		9'-6 1/8" x 8'-1 7/8"	9'-6 1/8" x 8'-5 7/8"			TRIPLE GLAZED		0.14		STC 47		CAT. II	
10	03	15'-6" x 8'-1 7/8"	15'-6" x 8'-5 7/8"			TRIPLE GLAZED		0.14		STC 47		CAT. II	
11	05	15'-6" x 8'-1 7/8"	15'-6" x 8'-5 7/8"			TRIPLE GLAZED		0.14		STC 47		CAT. II	
12	05	15'-6" x 8'-1 7/8"	15'-6" x 8'-5 7/8"			TRIPLE GLAZED		0.14		STC 47		CAT. II	

ARCHITECT/ENGENEER SHALL NOT HAVE CONTROL, CHARGE OF AND NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, DEVIATIONS, TECHNIQUES, SEQUENCES, PROCEDURES, SAFETY PRECAUTIONS AND/OR PROGRAMS IN CONNECTION WITH THE WORK, ACTS, OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS OR ANY OTHER PERSON PERFORMING ANY OF THE WORK, AND/OR FOR FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO HIRE PRIOR TO COMMENCEMENT OF ANY WORK AN INDEPENDENT ARCHITECT/ ENGINEER TO PERFORM CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE NYC BUILDING CODE. THE ARCHITECT / ENGINEER PERFORMING THE CONTROL INSPECTIONS SHALL INSPECT THE SITE TO INSURE THE SAFETY OF THE SITE, QUALITY OF WORK, COMPLIANCE TO NYC BUILDING CODE, ZONING RESOLUTION, AND / OR ANY APPLICABLE CODE IN ACCORDANCE WITH CONTRACT DOCUMENTS. THE ARCHITECT/ ENGINEER, PERFORMING CONTROL INSPECTIONS SHALL SUBMIT THE CONTROL INSPECTIONS, PROGRESS REPORT AND ALL FINDINGS OF THE WORKSITE TO THE DEPARTMENT OF BUILDINGS.

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SEAL

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Date: DEC 23 2015

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1353
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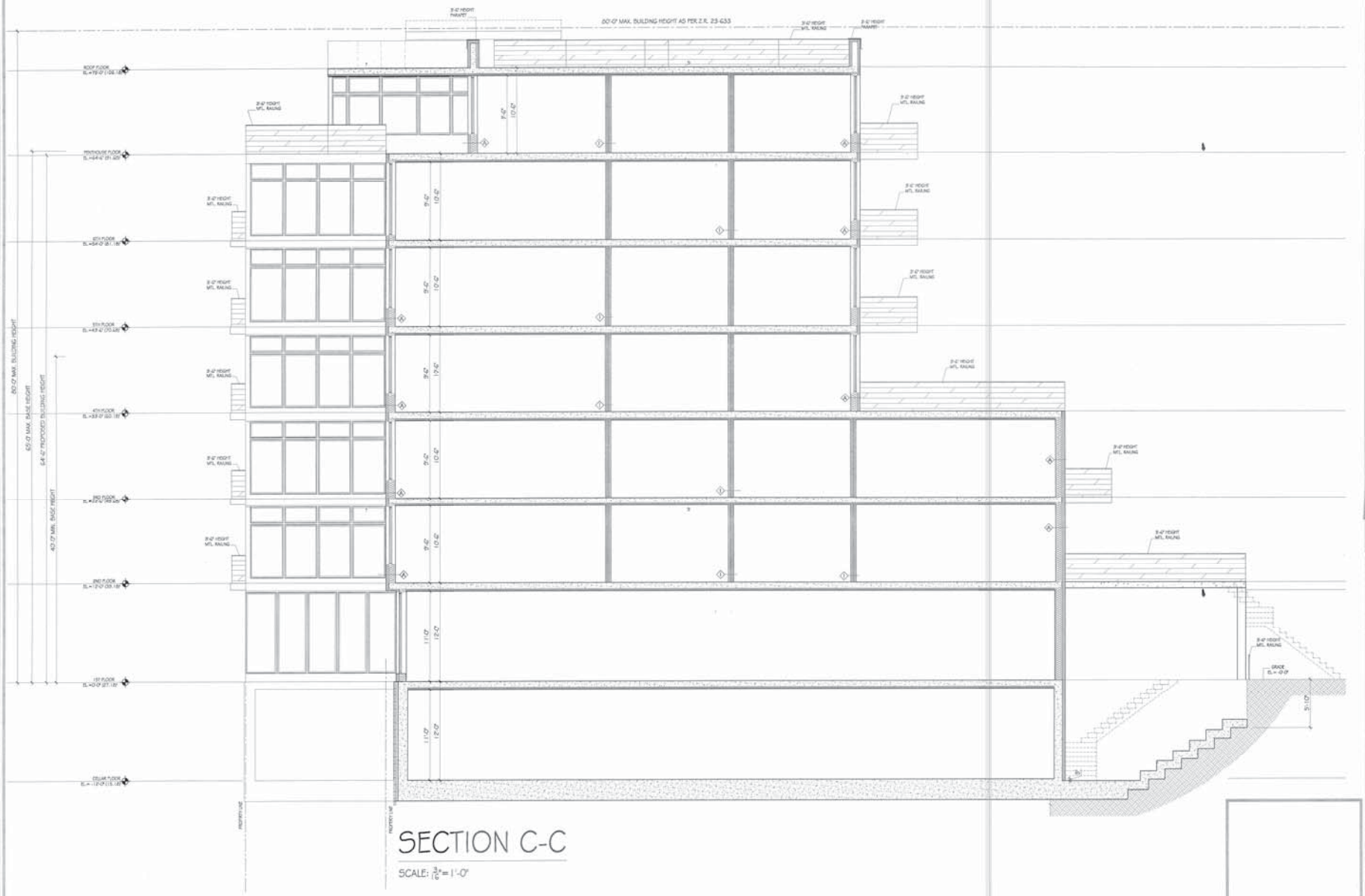
BROOKLYN, NY

SECTION B-B

DWG No
A-201.00

PAGE:

THE IMPLEMENTATION OF THESE DRAWINGS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BRING TO ARCHITECT'S ATTENTION IN WRITING ANY DISCREPANCIES IN THESE PLANS. THE CONTRACTOR SHALL SUBMIT TO ARCHITECT FOR APPROVAL ALL SHOP DRAWINGS AND SPECIFICATIONS RELATED TO THIS PROJECT.



SECTION C-C

SCALE: $\frac{3}{16}$"= 1'-0"

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SECTION C-C

DWG No.
A-202.00

DOB Application No. 310131075
Work Type 2014/08/04000

PAGE:

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PARTITION LEGEND

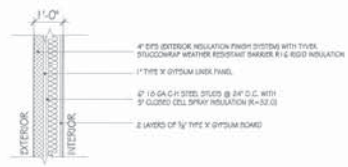
(SEE STRUCTURAL PLANS FOR DETAILS & SPECIFICATIONS.)

A — EXTERIOR WALL (1 HOUR RATED)
BASED ON GA FILE No. WP8123.
STC RATING >45, AS PER ASTM E 90.

TYPICAL EXTERIOR WALL 2ND-7TH FLOOR

B — EXTERIOR WALL (2 HOUR RATED)
BASED ON GA FILE No. WP8202.
STC RATING>45, AS PER ASTM E 90.

EXTERIOR WALL @ 1ST FLOOR
WHERE THERE ARE NO ADJ. BUILDING

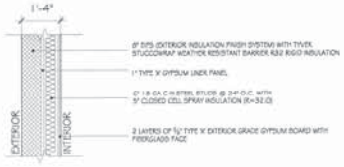


C — EXTERIOR WALL (2 HOUR RATED)
BASED ON WARNOCK-HERSEY DESIGN No. MW-WA 120.01
STC RATING > 50, AS PER ASTM E 90.

TYPICAL EXTERIOR WALL @
1ST FLOOR NEXT TO ADJ. BUILDING

D — EXTERIOR WALL (2 HOUR RATED)
BASED ON GA FILE No. WP8202.
STC RATING >45, AS PER ASTM E 90.

TYPICAL FLOOR - TRASH ROOM



E — EXTERIOR WALL (2 HOUR RATED)
BASED ON WARNOCK-HERSEY DESIGN No. MW-WA 120.01
STC RATING > 50, AS PER ASTM E 90.

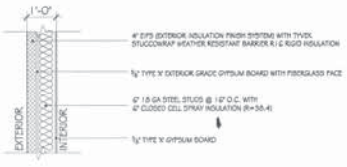
ELEVATOR SHAFT & TRASH CHUTE @
LOT LINE NEXT TO ADJ. BUILDING

E1 — EXTERIOR WALL (2 HOUR RATED)
BASED ON GA FILE No. WP8202.
STC RATING>45, AS PER ASTM E 90.

ELEVATOR SHAFT & TRASH CHUTE @
LOT LINE WHERE THERE ARE NO ADJ. BUILDING

F — EXTERIOR WALL (1 HOUR RATED)
BASED ON WARNOCK-HERSEY DESIGN No. MW-WA 120.01
STC RATING > 50, AS PER ASTM E 90.

2ND FLOOR @ LOT LINE NEXT TO ADJ. BUILDING



G — EXTERIOR WALL (1 HOUR RATED)
BASED ON GA FILE No. WP8123.
STC RATING >45, AS PER ASTM E 90.

2ND FLOOR @ LOT LINE BEYOND THE ADJ. BUILDING

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BROOKLYN, NY

WALL DETAILS

DWG No
A-300.00

DEPT BUILDINGS Job No 310131670
Scope Code 059 NEW BLDG
PAGES

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H — INTERIOR WALL (2 HOUR RATED)
BASED ON UL DESIGN No. U419
STC RATING > 50, AS PER ASTM E 90.

CELLAR CORRIDOR

I — INTERIOR WALL (2 HOUR RATED)
BASED ON UL DESIGN No. U444
STC RATING > 65, AS PER ASTM E 90.

BETWEEN APARTMENTS

J — INTERIOR WALL (1 HOUR RATED)
BASED ON UL DESIGN No. U419
STC RATING > 49, AS PER ASTM E 90.

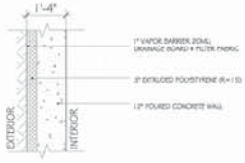
TYPICAL INTERIOR WALL

L — INTERIOR WALL (1 HOUR RATED)
BASED ON UL DESIGN No. U419
STC RATING > 49, AS PER ASTM E 90.

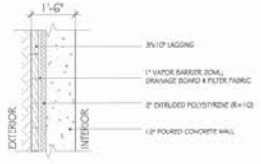
TYPICAL INTERIOR WALL @ BATHROOMS & KITCHENS

M — INTERIOR WALL (2 HOUR RATED)
BASED ON UL DESIGN No. U419
STC RATING > 49, AS PER ASTM E 90.

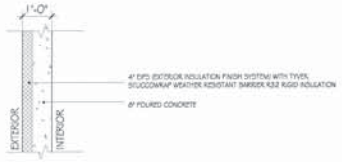
N — SHAFT WALL (2 HOUR RATED)
BASED ON UL DESIGN No. U415
STC RATING > 47, AS PER ASTM E 90.



O — FOUNDATION WALL



P — FOUNDATION WALL @ LOT LINE



Q — CONCRETE WALL @ STAIR 'A'

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WALL DETAILS

DWG No
A-301.00

DOB NOW Job No. 310131675
Work Permit E00430745

PAGE

PLUMBING SPECIFICATION

1. GENERAL CONDITIONS
THE PROVISIONS OF DIVISION 1 SHALL APPLY TO THE WORK OF THIS SECTION.

2. GENERAL
A. CONTRACTOR SHALL PROVIDE PROOF OF ADEQUATE INSURANCE TO HOLD OWNER, ARCHITECT, AND ENGINEER HARMLESS FOR ANY LIABILITY CLAIMS ARISING FROM PERFORMANCE OF HIS WORK.

B. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT UNNECESSARY DAMAGE TO BUILDING STRUCTURE AND PROTECT BUILDING OCCUPANTS.

C. CONTRACTOR SHALL VISIT JOB SITE AND THOROUGHLY FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS RELATIVE TO THE INSTALLATION OF THE WORK. NO ALLOWANCE WILL BE MADE FOR HIS FAILURE TO DO SO.

D. CONTRACTOR SHALL REVIEW THE PLANS OF OTHER TRADES AND COORDINATE HIS WORK TO PROVIDE FOR ADEQUATE SPACE AND CLEARANCES AS THE WORK PROGRESSES.

E. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH RULES AND REGULATIONS OF NEW YORK CITY BUILDING CODE, BASE BUILDING STANDARDS AND ALL OTHER AUTHORITIES HAVING JURISDICTION.

F. CONTRACTOR SHALL PAY ALL FEES, OBTAIN ALL NECESSARY PERMITS, AND COORDINATE UTILITY WORK.

G. ALL PIPING SHALL BE CONCEALED WITHIN THE HUNG CEILINGS OR WALLS. NO EXPOSED PIPING WILL BE ALLOWED.

H. ROUGHING AND FINAL CONNECTIONS TO EQUIPMENT WHICH IS FURNISHED BY OTHERS SHALL BE INSTALLED BY THIS CONTRACTOR.

I. FOR EXACT LOCATION OF PARTITIONS, CEILING HEIGHTS, SOFFITS, ETC., REFER TO THE ARCHITECTURAL DRAWINGS.

J. WASTE LINES INSTALLED AT CEILING OF SPACE BELOW THE FLOOR SHALL BE RUN TIGHT TO SLAB OR BOTTOM OF BEAMS.

K. THE CONTRACTOR SHALL RUN ALL PIPING AS REQUIRED TO PERFORM ALL WORK SHOW IN THE DRAWINGS AND COORDINATE LOCATIONS OF EXISTING DRAINAGE, WATER SUPPLY, ETC. AS REQUIRED TO COMPLETE ALL PLUMBING WORK SHOWN.

L. THE WORK UNDER THIS CONTRACT SHALL BE PERFORMED SIMULTANEOUSLY WITH THE WORK OF OTHER TRADES, SO AS NOT TO DELAY THE OVERALL PROGRESS OF WORK.

3. SHOP DRAWING SUBMISSIONS

A. SIX (6) COPIES OF FIXTURES MANUFACTURERS DATA SHALL BE SUBMITTED FOR APPROVAL PRIOR TO PURCHASE. REFER TO PROJECT MANUAL FOR SUBMISSION REQUIREMENTS

4. SCOPE OF WORK

A. FURNISH AND INSTALL ALL LABOR AND MATERIALS FOR INSTALLATION OF :
1) DRAINAGE AND VENT PIPING
2) HOT AND COLD WATER PIPING
3) ROUGHING AND FINAL CONNECTIONS FOR EQUIPMENT FURNISHED BY OTHERS
4) FURNISH AND INSTALL NEW PLUMBING FIXTURES.

5. PIPE INSTALLATION

A. ALL PIPING SHALL BE INSTALLED IN AN APPROVED MANNER.

B. DRAIN LINES SHALL HAVE REQUIRED UNIFORM SLOPE OF 1/4" PER FOOT MINIMUM. 1/8" PER FOOT WILL BE PERMITTED ON MAIN DRAIN LINES WHERE REQUIRED TO MAINTAIN CLEARANCES. ALL PIPING SHALL BE AMPLY SUPPORTED TO PREVENT ANY SAGGING OR BOWING.

C. WATER PIPING SHALL BE RUN PARALLEL TO BUILDING WALLS, AND SHALL BE AMPLY SUPPORTED. PROVIDE STOP VALVES AT ALL EQUIPMENT AND FIXTURES. PROVIDE SECTION SHUTOFF VALVES AT CONNECTIONS TO EXISTING PIPING.

D. CONTRACTOR SHALL PERFORM ALL NECESSARY CUTTING AND ROUGH PATCHING FOR THE ADMISSION OF HIS WORK.

6. MATERIALS

A. ALL MATERIALS USED SHALL BE NEW AND FREE OF DEFECTS.

B. PIPING: WHERE POSSIBLE PIPE MATERIALS SHALL MATCH EXISTING PIPE MATERIALS OR SHALL BE AS FOLLOWS:

SOIL, WASTE, OR VENT PIPING - CAST IRON "NO-HUB" PIPE AND FITTING (CISPI 301) ABOVE GROUND.

WATER PIPING - TYPE "L" COPPER TUBING "HARD TEMPER" WITH CAST BRASS SOLDER FITTINGS, NIBCO OR APPROVED EQUAL.

C. GAS PIPING SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH SCREWED MALLEABLE IRON FITTINGS.

D. VALVES - VALVES ON WATER PIPING SHALL BE ALL BRONZE AS MANUFACTURED BY MILWAUKEE VALVE COMPANY JENKINS, OR NIBCO. VALVES ON GAS PIPING SHALL BE WALWORTH LUBRICATED PLUG VALVES.

E. ALL HORIZONTAL STORM AND WASTE PIPING CONCEALED WITHIN HUNG CEILINGS OR WALLS AND ALL HOT AND COLD WATER PIPING SHALL BE INSULATED WITH CERTAINTEED OR APPROVED EQUAL 1/2" THICK FIBERGLASS INSULATION WITH ALL SERVICE JACKET (ASJ).

7. PLUMBING FIXTURES

ALL PLUMBING FIXTURES SHALL BE FIRST QUALITY UNBLEMISHED AND SHALL INCLUDE ALL PERTINENT OPERATION DEVICES. COLORS SHALL BE AS SELECTED BY ARCHITECT. ALL FIXTURES AMERICAN STANDARD UNLESS OTHERWISE INDICATED.

8. TESTING

A. ALL NEW INSTALLED SANITARY, HOT AND COLD WATER PIPING SHALL BE THOROUGHLY TESTED IN ACCORDANCE WITH N.Y. CITY BUILDING CODE.

WATER RISER DIAGRAM NOTES

1. INSTALLATION SHALL BE INSTALLED IN STRICT CONFORMITY WITH ALL REQUIREMENTS OF THE NEW YORK CITY PLUMBING CODE AND ALL PERTINENT REFERENCE STANDARDS GOVERNING WATER WORK.

2. WATER INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH THE LOCAL AUTHORITIES REQUIREMENTS.

3. ALL WATER SUPPLIES SHALL BE OVER THE RIM SUPPLY OR SHALL BE PROVIDED WITH APPROVED TYPE VACUUM BREAKERS INCLUDING ALL WATER CLOSET FLUSH VALVES AND HOSE BIB CONNECTIONS.

4. ALL WATER PIPING SHALL BE SIZED TO PRODUCE VELOCITIES NOT IN EXCESS OF 8' PER SECOND AND SHALL HAVE A MINIMUM OF 8 P.S.I. AT EVERY FIXTURE.

5. EXPANSION LOOPS AND ANCHORS SHALL BE PROVIDED FOR EXPANSION IN HOT RECIRCULATING PIPING LINES.

6. ALL CONNECTIONS TO EQUIPMENT OF DISSIMILAR MATERIAL SHALL BE PROVIDED WITH DIELECTRIC UNIONS.

7. PROVIDE VALVES ON ALL BRANCH LINES TO EACH FIXTURE AND EQUIPMENT INCLUDING BRANCHES FROM MAINS AND FROM RISER. ALL RISER AND MAINS SHALL BE PROVIDED WITH VALVES.

8. WHERE BRANCH SUPPLIES ARE TRAPPED AT LOW POINTS, AND WHERE BRANCH OR MAINS SUPPLY FIXTURES OR EQUIPMENT LOCATED HIGHER THAN SUPPLY MAIN, PROVIDE DRAIN BIBS ON LINE.

9. FIXTURES PROVIDED BY G.C. ARE TO BE INSTALLED AND SET BY THE PLUMBING CONTRACTOR. THE PLUMBING CONTRACTOR SHALL PROVIDE ALL TRAPS, TRIM NOT PROVIDED BY THE G.C, AND SHALL CONNECT ALL FIXTURES, EQUIPMENT AND MAKE FINAL CONNECTIONS.

10. THIS CONTRACTOR SHALL CONNECT AND PROVIDE ALL NECESSARY SERVICES TO ALL FIXTURES AND EQUIPMENT INDICATED ON THE PLUMBING AND ARCHITECTURAL DRAWINGS.

11. PLUMBING CONTRACTOR TO COORDINATE LAYOUT WITH THE KITCHEN EQUIPMENT SUPPLIER.

GAS NOTES

1. ALL MATERIALS USED IN GAS DISTRIBUTION PIPING SYSTEM SHALL BE IN ACCORDANCE WITH DEPARTMENT OF BUILDINGS REQUIREMENTS AND ANSI Z223.1-1774, NATIONAL FUEL CODE AND ALL AGENCIES HAVING JURISDICTION.

2. THE INSTALLATION OF GAS SERVICE PIPING SHALL BE MADE IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY CORPORATION PROVIDING THE SERVICE AS REGULATED BY PART 255, OF TITLE 16, OF THE OFFICIAL COMPILATION OF CODES, RULES AND REGULATIONS OF THE STATE OF NEW YORK.

3. BRANCH LINES SHALL BE TAKEN OFF THE RISER WITH NOT LESS THEN TWO ELBOWS SWING. BRANCH OUTLET PIPES SHALL BE TAKEN FROM THE TOP OR SIDES OF HORIZONTAL LINES AND NOT FROM THE BOTTOM.

4. PROVIDE STOP COCK OR VALVE FOR EACH GAS BURNING FIXTURE AND EQUIPMENT REQUIRING GAS.

GAS PIPING INSTALLATION NOTES

1. ALL PIPING SHALL BE SCHEDULE 40 BLACK STEEL WITH 125 LB. CAST IRON SCREWED FITTINGS.
2. PROVIDE SHUT-OFF GAS COCKS IN GAS SERVICE PIPING AT CONNECTIONS TO EXISTING MAIN.
3. ALL GAS PIPING SHALL BE SUPPORTED FROM BUILDING STRUCTURE IN AN APPROVED MANNER.
4. PROVIDE GAS COCK CONNECTION TO GAS TRAIN FOR EACH GAS-FIRED EQUIPMENT ITEM AND ON RISERS AND BRANCHES WHERE INDICATED.
5. LOCATE GAS COCKS WHERE EASILY ACCESSIBLE, AND WHERE THEY WILL BE PROTECTED FROM POSSIBLE DAMAGE.
6. CONNECT GAS PIPING TO EACH GAS-FIRED EQUIPMENT ITEM IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

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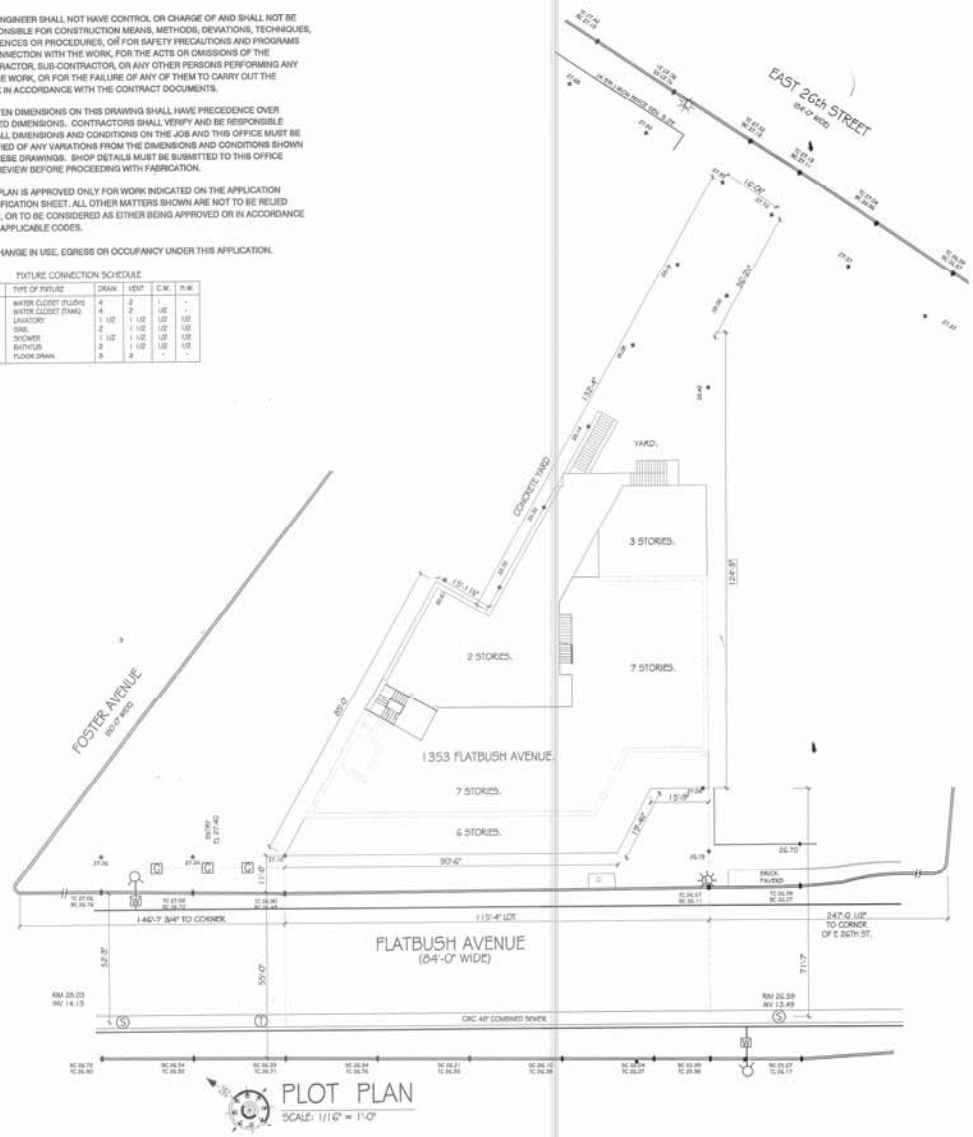
WRITTEN DIMENSIONS ON THIS DRAWING SHALL HAVE PRECEDENCE OVER SCALED DIMENSIONS. CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THIS OFFICE MUST BE NOTIFIED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN BY THESE DRAWINGS. SHOP DETAILS MUST BE SUBMITTED TO THIS OFFICE FOR REVIEW BEFORE PROCEEDING WITH FABRICATION.

THIS PLAN IS APPROVED ONLY FOR WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON, OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

NO CHANGE IN USE, EGRESS OR OCCUPANCY UNDER THIS APPLICATION.

FIXTURE CONNECTION SCHEDULE

	TYPE OF FIXTURE	DRAIN	VENT	C.W.	H.W.
W.C.	WATER CLOSET (FLUSH)	4	2	1	-
W.C.	WATER CLOSET (TANK)	4	2	1/2	-
LAV.	LAVATORY	1 1/2	1 1/2	1/2	1/2
S.	SINK	2	1 1/2	1/2	1/2
SH.	SHOWER	1 1/2	1 1/2	1/2	1/2
TUB.	BATHTUB	2	1 1/2	1/2	1/2
F.D.	FLOOR DRAIN	3	2	-	-



Accepted For OPPN #1/04
Professional Certification
BROOKLYN
Date: DEC 23 2015

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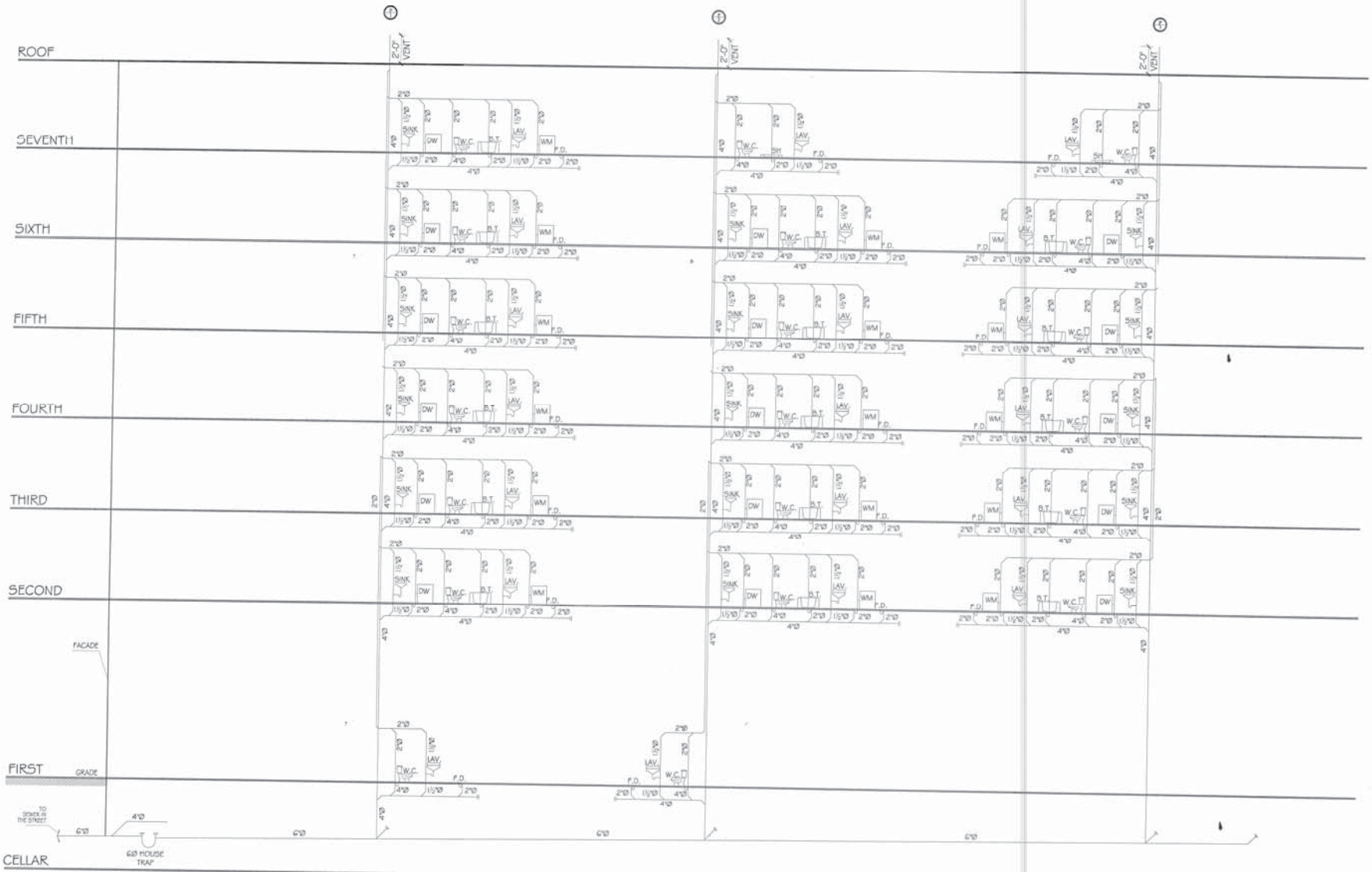
BROOKLYN, NY

ROOF PLAN

DWG No
P-001.00



PLUMBING RISER DIAGRAM

NOT TO SCALE

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SEAL

DRAWN BY	XX
CHECKED BY	XX
DATE	XX/XX/XX

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Professional Certification
BROOKLYN
Date: DEC 23 2015

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1353
FLATBUSH AVENUE
BROOKLYN, NY

PLUMBING
RISER
DIAGRAM

DWG No
P-100.00

PAGE:

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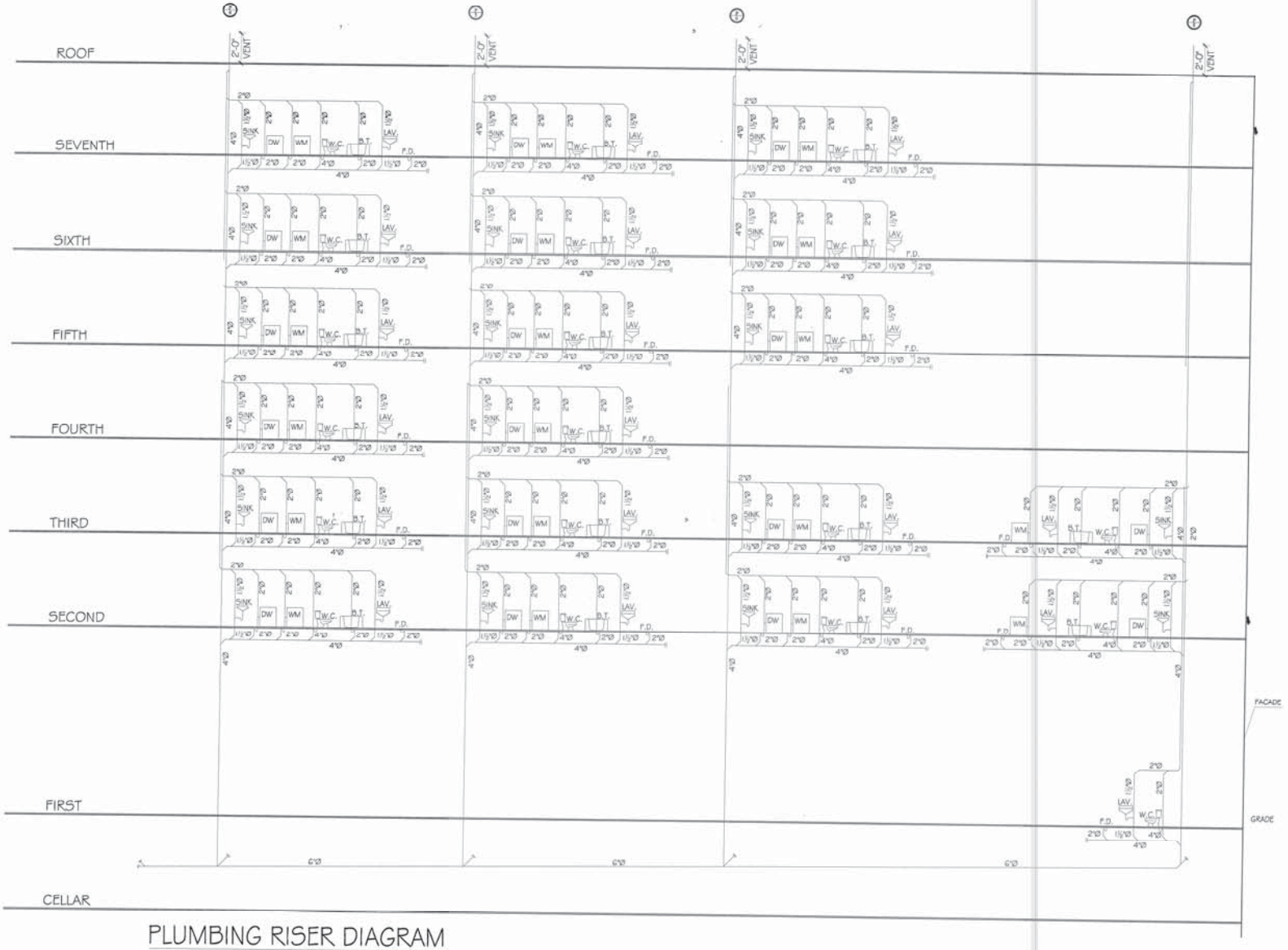

PLUMBING RISER DIAGRAM

NOT TO SCALE

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PLUMBING
RISER
DIAGRAM

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P-101.00

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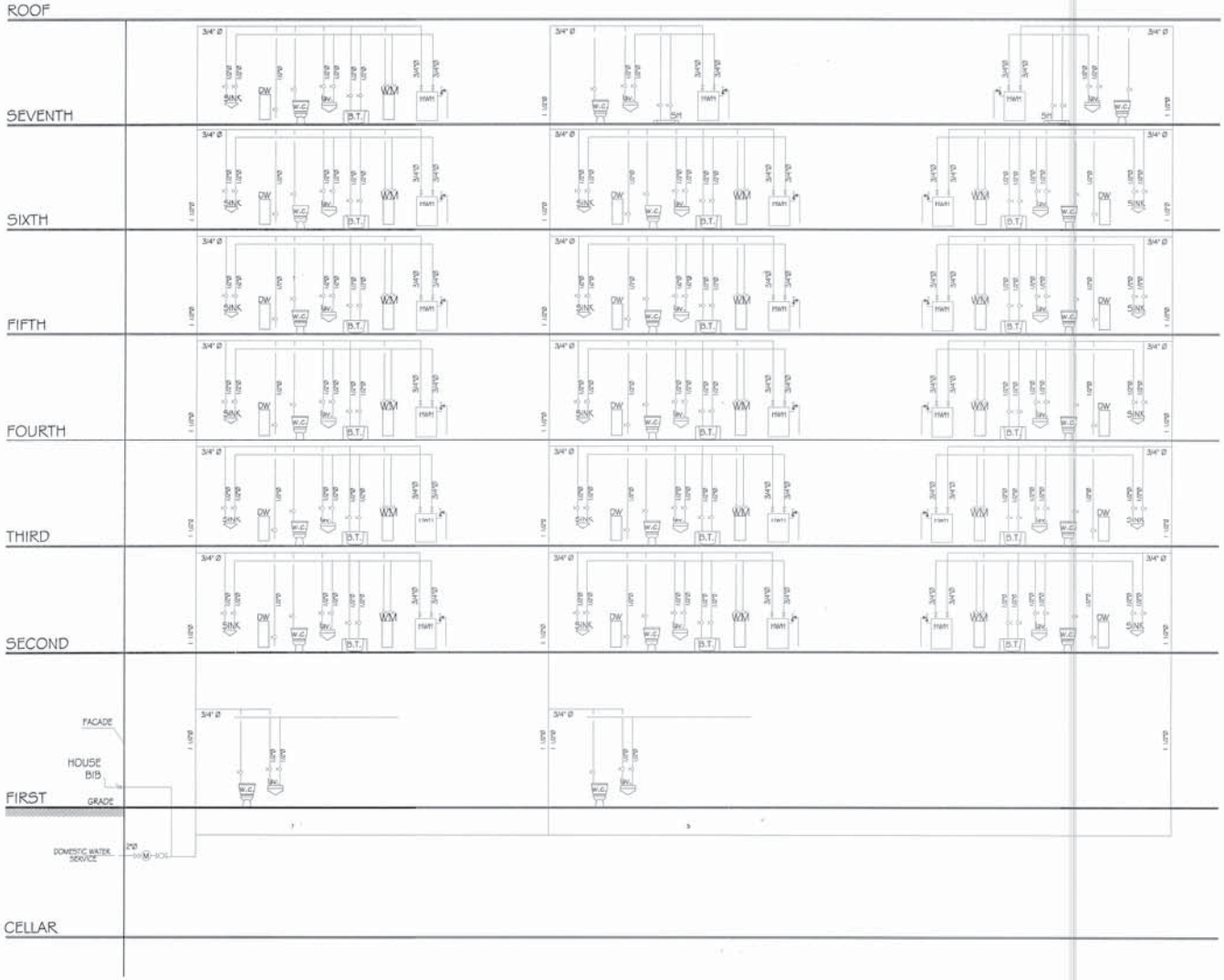

COLD AND HOT WATER RISER DIAGRAM

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HOT AND
COLD WATER
RISEWR DIAGRAM

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P-102.00

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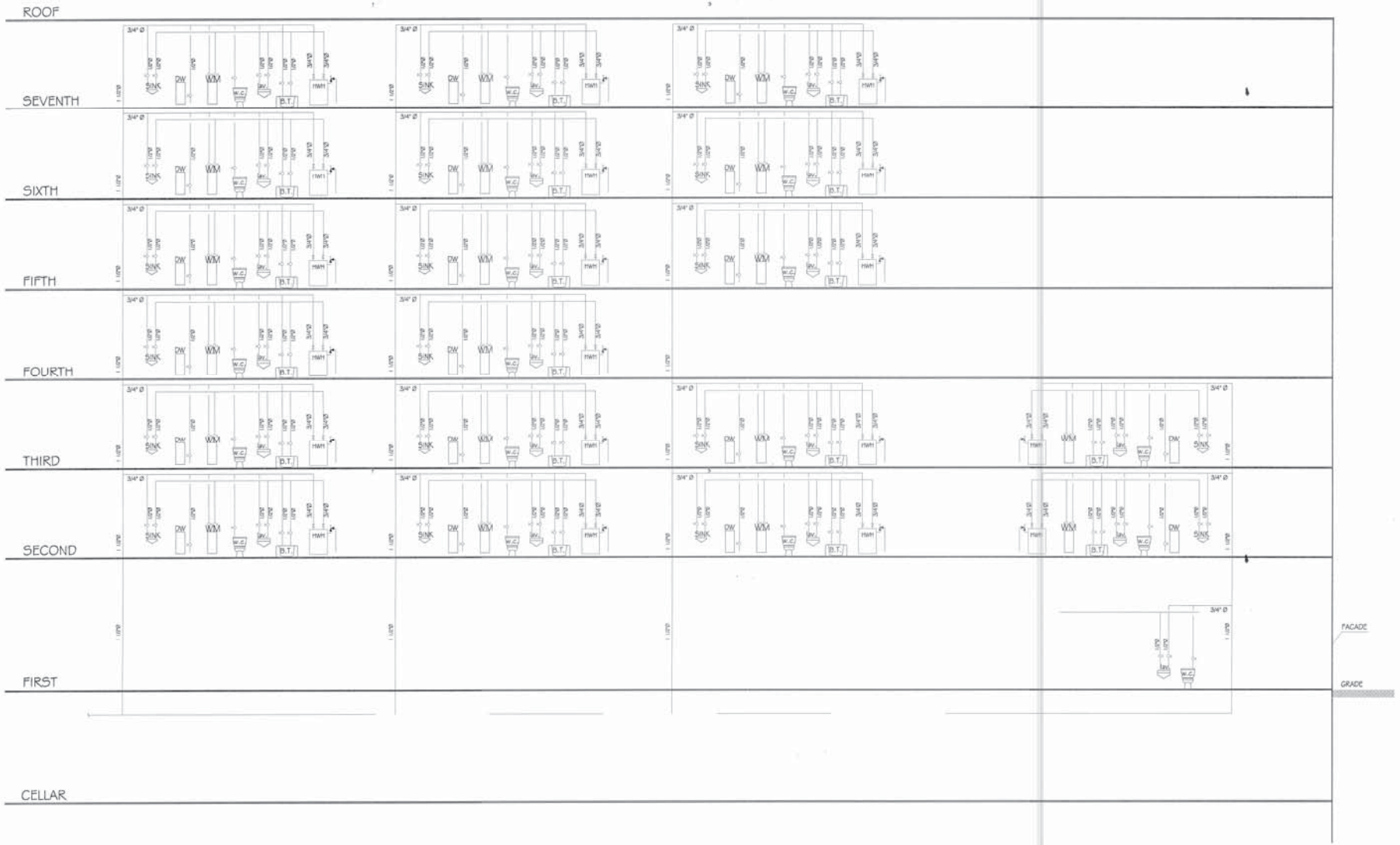

COLD AND HOT WATER RISER DIAGRAM

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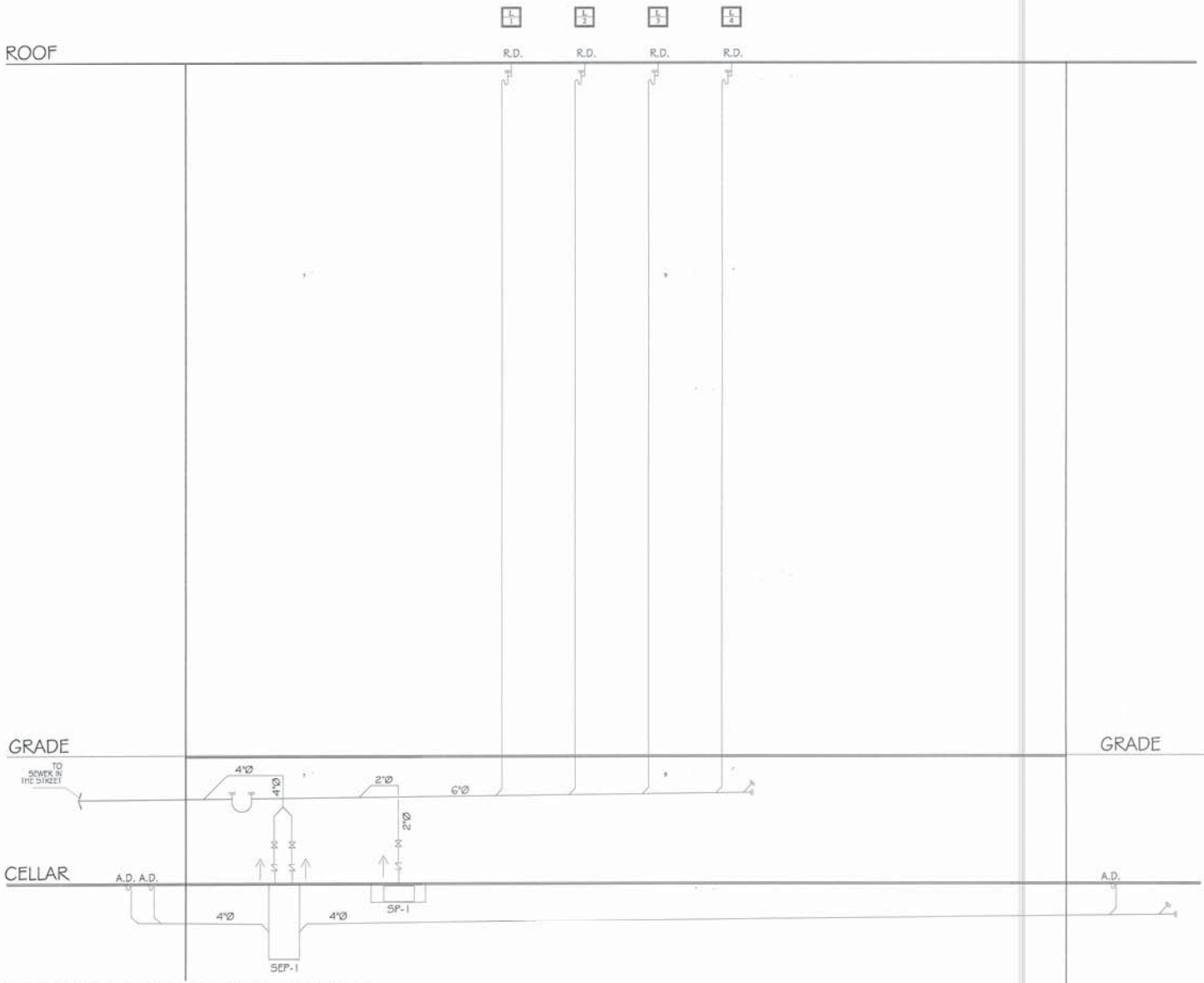
HOT AND
COLD WATER
RISEWR DIAGRAM

DRWG No
P-103.00



STORM RISER DIAGRAM

NOT TO SCALE

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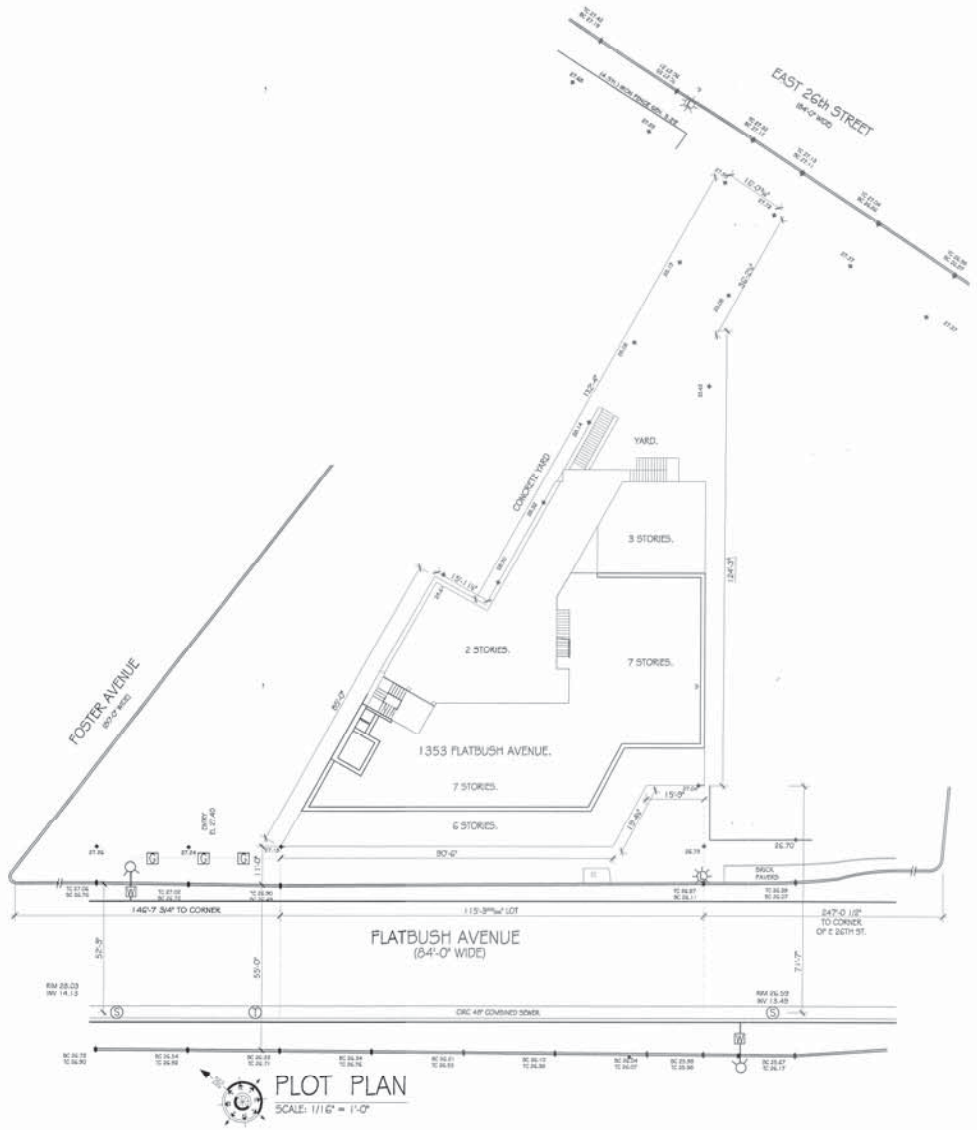
STORM SEWER
RISEWR DIAGRAM

DWG No
P-104.00



PLOT PLAN
SCALE: 1/16" = 1'-0"

LEGEND

	ONE-POLE WALL-MOUNTED LIGHT SWITCH
3	THREE-WAY WALL-MOUNTED LIGHT SWITCH
FS OR D	FAN SPEED OR LIGHT DIMMER
	110 VOLTS 15 AMP POWER DUPLEX RECEPTACLE
GFI	15A, 1PH, 3W DUPLEX RECEPTACLE OUTLET WITH GROUND FAULT INTERRUPTER, WALL-MOUNTED, 48" A.F.F.
GFI	GFI,110 VOLTS 15 AMP POWER QUADRUPLEX RECEPTACLE
	208V, 20A, 3 PHASE, 4 PRONG RECEPTACLE
	208/120VAC, 30A, FOUR PRONG RECEPTACLE
AC	AIR CONDITIONER HOME RUN. 110 VOLTS 15 AMP POWER RECEPTACLE
WP	110 VOLTS 15 AMP POWER DUPLEX RECEPTACLE WEATHERPROOF
a	SWITCHED OUTLET
T	TEMPER PROOF OUTLET
	ELECTRICAL PANEL RECESSED MOUNTED
	CURRENT TRANSFORMER
	MOTOR # INDICATES HP (HORSE POWER)
UF	SAFETY SWITCH (UNFUSED)
S	EMERGENCY BOILER SHUT-OFF SWITCH
	EXHAUST FAN
	CEILING MOUNTED INCANDESCENT LIGHT FIXTURE
	EMERGENCY EXIT SIGN, DOUBLE FACE MOD#LXNYSW3R120/277ELN BY LIGHONIA LIGHTING OR EQUAL
	TITAN EMERGENCY LIGHT MOD#ELT632CNY BY LITHONIA LIGHTING OR EQUAL
	JUNCTION BOX
PH	PHOTOSENSOR LIGHT
	70W HPS OUTDOOR POLYCARBONATE WALL PACK MOD#5MM59 BY LUMAPRO OR EQUAL
	26W FLUORESCENT OUTDOOR POLYCARBONATE WALL PACK MOD#TWS26/42TRTMVOLTL/LP BY LITHOLIA LIGHTING OR EQUAL
	COMBINATION STARTER SWITCH
EC	INDICATES EMERGENCY CIRCUIT. LIGHT OR POWER
E	INDICATES EMERGENCY LIGHT /W POWER SENTRY FIELD-INSTALLABLE FLUORESCENT BATTERY PACK MOD#PSQ500 BY LITHOLIA LIGHTING OR EQUAL
E	4' EMERGENCY CEILING MOUNTED FLUORESCENT STRIP LIGHT WITH CONVERTER BALLAST
	4' CEILING MOUNTED FLUORESCENT STRIP LIGHT
	RECESSED FLUORESCENT TROFFER MOD#2GT82U316A12MVOLTGEB10IS BY LITHONIA LIGHTING OR EQUAL
	SHALLOW MUSHROOM COMPACT FLUORESCENT FIXTURE
W	WATERTIGHT RECESSED FLUORESCENT DOWN LIGHT
	RECESSED FLUORESCENT DOWN LIGHT
	2' WALL-MOUNTED FLUORESCENT VANITY FIXTURE
1 / P-1A	BRANCH CIRCUIT RUN TO PANELBOARD HATCH INDICATES CIRCUITS, DASHES INDICATE NUMBER OF WIRES
I/C	APARTMENT INTERCOM STATION
	APARTMENT PUSH-BUTTON
E.L	ELECTRIC LOCK
SI	SMOKE DETECTOR
	DECORATIVE WALL SCONCE, 2x13W FLUORESCENTS
	WALL SCONCE, 2x13W FLUORESCENTS
	TELEPHONE RECEPTACLE
	DATA & TELEPHONE RECEPTACLE
T1	A19DAC-1C HOT WATER TEMPERATURE CONTROL WITH WATER PIPE STRAP-ON MOUNT
T2	RANCO ETC-111000-000 DIGITAL TEMPERATURE CONTROLLER
	LOW BAY HID FIXTURE, 250W
	HIGH BAY LEG FIXTURE, 250W, THREE MODULE

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PLLOT PLAN
LEGEND

DWG No
EL-001.00

GENERAL NOTES:

1. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC, SIZES AND LOCATION OF EQUIPMENT AND WIRING ARE SHOWN TO SCALE WHERE POSSIBLE, BUT MAY BE DISTORTED FOR CLARITY ON THE DRAWINGS. FINAL LOCATION OF OUTLETS AND EQUIPMENT SHALL BE AS APPROVED BY THE ARCHITECT OR HIS REPRESENTATIVE. IT IS NOT WITHIN THE SCOPE OF DRAWINGS TO SHOW ALL NECESSARY BENDS, OFFSETS, PULL BOXES, AND OBSTRUCTIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL HIS WORK TO CONFORM TO THE STRUCTURE, PRESERVE HEADROOM, AND KEEP OPENINGS AND PASSAGEWAYS CLEAN.
2. CONTRACTOR, BEFORE SUBMITTING A PROPOSAL, SHALL VISIT AND CAREFULLY EXAMINE THE AREAS AFFECTED BY THIS WORK TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND WITH THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT, OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH EXAMINATION BEEN MADE.
3. BIDS SHALL INCLUDE ALL POWER, GROUNDING, AND EMPTY CONDUIT REQUIREMENTS NECESSARY FOR THE COMPLETE ELECTRICAL INSTALLATION.
4. FURNISH AND INSTALL WIRING FOR EQUIPMENT FURNISHED BY OTHERS, AS SHOWN ON ARCHITECTURAL, HVAC, PLUMBING, AND/OR ELECTRICAL DRAWINGS. COORDINATE WITH OTHER TRADES FOR DETAILS OF INSTALLATION AND WIRING REQUIREMENTS. THE TERM "WIRING" AS USED HEREIN SHALL INCLUDE FURNISHING AND INSTALLING CONDUIT, WIRES, JUNCTION/OUTLET BOXES, DISCONNECTS, OVER CURRENT PROTECTION, AND FINAL CONNECTIONS. COORDINATE FINAL CONDUCTOR SIZES, QUANTITIES, VOLTAGE REQUIREMENTS, OVER CURRENT DEVICES, AND OUTLET RATINGS WITH ACTUAL EQUIPMENT TO BE FURNISHED TO THE SITE PRIOR TO FINALIZING WIRING INSTALLATION. MINOR ADJUSTMENTS TO WIRING REQUIREMENTS NECESSARY TO ACCOMMODATE ACTUAL FURNISHED EQUIPMENT SHALL BE PROVIDED AT NO ADDITIONAL COST TO OWNER.
5. THE ELECTRICAL CONTRACTOR SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING CODES AND STANDARDS:
   A. UNDERWRITERS LABORATORIES, INC.. (UL)
   B. NATIONAL ELECTRICAL CODE OF THE NFPA (NEC) & NEW YORK CITY ELECTRICAL CODE.
   C. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
   D. ALL LOCAL JURISDICTION DIRECTIVES AND REQUIREMENTS
   E. AMERICAN DISABILITIES ACT (ADA)
   F. BUILDING CODE, RULES AND REGULATIONS.
6. CUTTING AND PATCHING OF THE EXISTING CONSTRUCTION WHICH MAY BE REQUIRED FOR THE PROPER INSTALLATION OF THE ELECTRICAL WORK SHALL BE DONE BY THIS CONTRACTOR. PATCHING SHALL BE OF THE SAME MATERIALS, WORKMANSHIP, AND FINISH AND SHALL ACCURATELY MATCH SURROUNDING CONSTRUCTION.
7. VERIFY LOCATIONS OF ALL ELECTRICAL EQUIPMENT WITH ARCHITECTURAL DRAWINGS OR INTERIOR DETAILS. IN CENTERING OUTLETS AND LOCATING BOXES OR OUTLETS, ALLOW FOR OVERHEAD PIPES, DUCTS, MECHANICAL EQUIPMENT, VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILING, ETC., AND CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.
8. LOCATE JUNCTION AND PULL BOXES TO BE CONCEALED IN FINISHED SPACES. WHERE NECESSARY, REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. PROVIDE PULL BOXES WHERE NECESSARY FOR WIRE PULLING. COORDINATE ALL BOX LOCATIONS WITH OTHER TRADES. COVERS OF JUNCTION AND PULL BOXES SHALL BE ACCESSIBLE.
9. SECURE ALL SUPPORTS TO BUILDING STRUCTURE AS REQUIRED. SUPPORT HORIZONTAL CONDUIT RUNS AT NO MORE THAN 10' INTERVALS.
10. UPON COMPLETION OF ALL ELECTRICAL WORK, ELECTRICAL CONTRACTOR SHALL ADJUST AND TEST ALL CIRCUITS, OUTLETS, SWITCHES, LIGHTS, MOTORS, AND ANY OTHER ELECTRICAL ITEMS INSTALLED. ANY DEFECTIVE ITEMS SHALL BE IMMEDIATELY REPAIRED OR REPLACED WITH NEW EQUIPMENT OR MATERIALS AND THAT PORTION OF THE SYSTEM SHALL BE RETESTED. ALL SUCH REMEDIAL WORK SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
11. ELECTRICAL CONTRACTOR SHALL BALANCE LOADS AMONG PHASES.
12. EQUIPMENT, DUCTWORK, AND MATERIALS SHALL BE PROTECTED AGAINST DAMAGE DUE TO BUILDING MATERIALS, ACID, TOOLS, AND EQUIPMENT OR ANY CAUSES INCIDENTAL TO CONSTRUCTION. ALL EQUIPMENT DAMAGE BY ANY CAUSE SHALL BE REPAIRED AT NO COST TO THE OWNER.
13. AFTER COMPLETION OF WORK, THIS CONTRACTOR SHALL CLEAN ALL EQUIPMENT AND DEVICES AND SHALL REMOVE ALL RUBBISH, CRATING, UNUSED MATERIAL, AND ANY OTHER DEBRIS OCCASIONED BY THIS INSTALLATION. CONTRACTOR SHALL LEAVE ALL WORK IN A FINISHED, CLEAN, AND SATISFACTORY WORKING CONDITION.
14. ALL CONDUIT SHALL BE ELECTRIC METALLIC TUBING (EMT), MINIMUM 3/4", UNLESS OTHERWISE NOTED. FLEXIBLE METAL CONDUIT ("GREENFIELD") MAY BE USED ONLY FOR FINAL CONNECTIONS TO LIGHTING FIXTURES OR VIBRATING EQUIPMENT UNLESS OTHERWISE INDICATED ON DRAWINGS. ARMORED CABLE ("BX") MAY BE USED, AS COORDINATED WITH THE OWNER, WHERE ALLOWED BY CODE, FOR CONCEALED WORK IN PARTITIONS AND CEILINGS.
15. CONDUCTORS #10 AWG AND SMALLER SHALL BE COPPER, SOLID OR STRANDED, TYPE THHN/THWN; #8 AWG AND LARGER SHALL BE COPPER, STRANDED, TYPE THHN/THWN. ALL WIRING FOR LIGHTING AND POWER SHALL BE #12 AWG MINIMUM.
16. BRANCH CIRCUIT HOMERUN CONDUCTORS SHALL BE INCREASED ONE SIZE (MINIMUM) TO COMPENSATE FOR VOLTAGE DROP FOR 120 VOLT CIRCUITS EXCEEDING 100'.
17. ALL CHOPPING OF FLOOR SLAB FOR ELECTRICAL INSTALLATION SHALL BE COORDINATED WITH CONSTRUCTION MANAGER.
18. ALL PENETRATIONS THROUGH FIRE RATED WALLS OR FLOORS SHALL BE SEALED TO MATCH THE FIRE RATINGS OF WALLS OR FLOORS IN THE SAME AREA. USE A UL APPROVED SEALING METHOD WHICH IS ACCEPTABLE TO OWNER.
19. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO SURVEY AREA OF WORK INCLUDING CIRCUITS AVAILABLE AND ALL ASSOCIATED CONTROL. PROVIDE UPDATED PANEL SCHEDULES AND "AS-BUILT" DRAWINGS INDICATING TRUE CIRCUITING AND CONTROLS UPON COMPLETION OF WORK.
20. THE ELECTRICAL CONTRACTOR SHALL BRING TO THE ATTENTION OF THE ENGINEER ANY ITEMS WHICH DIFFER FROM THE BID DOCUMENTS, OR MIGHT PREVENT PROPER INSTALLATION.
21. AFTER COMPLETION OF THE PROJECT, PERFORM A TEST OF THE EMERGENCY EGRESS LIGHTING SYSTEM. TEST SHALL BE PERFORMED AFTER DARK (AT LEAST 1 HOUR AFTER SUNSET); SIMULATE POWER FAILURE ON ALL LIGHTING CIRCUITS. TAKE LIGHT LEVEL READINGS ALONG PATHS OF EGRESS UTILIZING A FOOT CANDLE METER: RECORD READINGS ON A REDUCED SCALE (1/16" - 1'-0") FLOOR PLAN. READINGS SHALL BE TAKEN AT THE MIDPOINT BETWEEN EMERGENCY FIXTURES AT A HEIGHT OF 18 INCHES ABOVE FLOOR. SUBMIT SEALED AND SIGNED COPY OF THE FLOOR AND READINGS TO THE ENGINEER.
22. THE OPERATION OF THE ELECTRICAL INSTALLATION DOES NOT CONSTITUTE AN ACCEPTABLE OF THE WORK BY THE OWNER. FINAL ACCEPTANCE IS TO BE MADE AFTER THE CONTRACTOR HAS DEMONSTRATED THAT THE WORK FULFILLS THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS AND HAS FURNISHED ALL REQUIRED CERTIFICATES OF APPROVAL FROM THE STATE AUTHORITIES, MUNICIPAL AUTHORITIES AND UNDERWRITERS.
23. ELECTRICAL CONTRACTOR SHALL PROVIDE AN ELECTRICAL INSPECTION APPROVAL CERTIFICATE TO OWNER UPON COMPLETION OF WORK.

LIGHTING PLAN NOTES:

1. FOR EXACT LOCATION AND MOUNTING HEIGHTS OF ALL LIGHTING FIXTURES, SWITCHES AND JUNCTION BOXES, SEE ARCHITECTURAL DRAWINGS.
2. CIRCUITS ARE DESIGNATED BY THE NUMBER SHOWN ADJACENT TO EACH LIGHTING FIXTURE OR JUNCTION BOX. WIRING IS SHOWN ONLY UNDER SPECIAL CIRCUMSTANCES. PROVIDE ALL CONDUIT, WIRE AND BOXES AS WELL AS CEILING OUTLETS AND WHIPS REQUIRED TO ENERGIZE LIGHTING FIXTURES AS SHOWN.
3. CIRCUIT NUMBERS ARE FOR GROUPING PURPOSES AND FOR REFERENCE ONLY. FIELD CONDITIONS PREVAIL.
4. COORDINATE LIGHTING FIXTURE TYPES, CONTROL DEVICES (SWITCHES, DIMMERS, KEY PADS, ETC.) AND SPECIFICATIONS WITH ARCHITECT AND INTERIOR DESIGNER. REFER TO LIGHTING FIXTURE SCHEDULE ON ARCHITECTURAL DRAWINGS.
5. FOR ADDITIONAL LIGHTING NOTES, SEE ARCHITECTURAL DRAWINGS.
6. U.O.N.. ALL BRANCH CIRCUIT WIRING SHALL BE RUN IN WALLS AND ABOVE HUNG CEILING. FINAL CONNECTIONS TO LIGHTING FIXTURES SHALL BE MADE WITH WIRING HAVING 90°C RATED INSULATION.
7. ALL LIGHTING CIRCUITS SHALL HAVE A DEDICATED NEUTRAL, COMBINING NEUTRALS ON LIGHTING CIRCUITS IS NOT ALLOWED.
8. PROVIDE A DEDICATED #12 AWG GREEN GROUNDING CONDUCTOR FOR ALL LIGHTING CIRCUITS.
9. OBTAIN LIGHTING CUTS FROM ARCHITECT.

SECURITY AND MISCELLANEOUS SYSTEM NOTES:

1. COORDINATE MISCELLANEOUS SYSTEM WIRING, ROUTING, AND TERMINATION OF THE WIRING WITH THE CLIENT.
2. PROVIDE JUNCTION BOX AND CONDUIT STUB UPS AS REQUITED TO FACILITATE WIRING OF THESE DEVICES.
3. COORDINATE LOCATION OF DEVICES WITH ARCHITECT.

SECURITY DEVICES

NOTE:
FOR EACH SECURITY & LOW VOLTAGE SYSTEM DEVICES: PROVIDE UTILITY/JUNCTION BOX AND STUB UP 3/4" EMPTY CONDUIT - WITH BUSHED END AND DRAG LINE AS FOLLOWS:
IN SPACES WITH HUNG CEILING: STUB-UP SHALL BE TERMINATED 6" ABOVE HUNG CEILING WITH 90° BEND POINTING TOWARDS SYSTEM PANEL.
IN SPACES WITHOUT HUNG CEILING: PROVIDE A 3/4" EMPTY CONDUIT WITH DRAG WIRE TO ACCESSIBLE CEILING/EQUIPMENT CLOSET.

POWER & MECHANICAL POWER NOTES:

1. FOR EXACT LOCATION AND MOUNTING HEIGHTS OF ALL POWER, TELEPHONE/DATA OUTLETS AND MECHANICAL EQUIPMENT AND FOR ADDITIONAL POWER NOTES SEE ARCHITECTURAL DRAWINGS.
2. CIRCUITS ARE DESIGNATED BY THE NUMBER SHOWN ADJACENT TO EACH RECEPTACLE, MECHANICAL EQUIPMENT & ETC. WIRING IS SHOWN ONLY UNDER SPECIAL CIRCUMSTANCES. PROVIDE CONDUITS, WIRES AND BOXES REQUIRED TO ENERGIZE THE EQUIPMENT AS SHOWN.
3. CIRCUIT NUMBERS ARE FOR REFERENCE ONLY. FIELD CONDITIONS PREVAIL.
4. ALL BRANCH WIRING SHALL BE RUN CONCEALED IN WALLS AND ABOVE CEILINGS, U.O.N.
5. PROVIDE MANUAL MOTOR STARTER SWITCH WITH INTEGRAL THERMAL OVERLOAD PROTECTION AT EACH SINGLE PHASE FAN MOTOR, SQUARE "D" CLASS 2510, TYPE FG-1.
6. MECHANICAL AND PLUMBING EQUIPMENT IS INSTALLED BY OTHERS. PROVIDE DISCONNECT SWITCHES, CONDUITS AND WIRES AND MAKE CONNECTIONS AS SHOWN – PROVIDE IN-SIGHT ADDITIONAL DISCONNECT MEANS AS PER CODE.
7. ALL CABLES USED FOR COMMUNICATION CIRCUITS,TO BE INSTALLED IN PLENUMS, DUCTS AND OTHERS SPACES USED FOR ENVIRONMENTAL AIR SHALL BE ACCORDANCE WITH NEC, ARTICLE 800 AND AS AMENDED FOR APPLICATIONS IN THE CITY OF NEW YORK.

THE ENGINEER SHALL NOT HAVE CONTROL OR CHARGE OF AND SHALL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, DEVIATIONS, TECHNIQUES, SEQUENCES OR PROCEDURES AND PROGRAMS IN CONNECTION WITH THE WORK, FOR THE ACTS OR OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS, OR ANY OTHER PERSONS PERFORMING ANY OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

INTERCOM NOTES

1. ENTRANCE PANEL
THE ENTRANCE PANEL SHALL BE VANDAL RESISTANT, MODULAR, EQUIPPED WITH A MYLAR, VOICE-FREQUENCY RESPONCE SPEAKER PROTECTED BY A LOUVERED GRILL AND PERFORATED ALUMINUM MATERIAL. THE ALUMINUM PUSH BUTTON ACTUATORS MAY BE PERMANENTLY ENGRAVED. PANEL SHOULD FEATURE ALPHABETICAL DIRECTORY STYLE LISTINGS AND HEAVY DUTY EXTRUDED ALUMINUM COSTRUCTION. AS PER ALPHA COMMUNICATIONS/TECTONE MODEL# CM492.

2. APARTMENT INTERCOM STATION
APARTMENT STATION SHOULD BE SURFACE MOUNTED, FEATURE MODERN STYLING WITH EASE OF OPERATION TO PROVIDE NATURAL, CLEAR VOICE COMMUNICATION AND POSITIVE DOOR RELEASE OPERATION. THE ADVANCED CIRCUITRY AND VERSATILITY TO PERMIT THE USE IN LARGE OR SMALL BUILDINGS, WITH ONE AND/OR MORE ENTRANCES AND BE CONNECTED IN PARALLEL FOR MULTIPLE STATION INSTALLATION PER APARTMENT. MOMENTARY ACTION PUSH BUTTONS FOR TALK, LISTEN, AND DOOR OPERATION. AS PER ALPHA COMMUNICATIONS/TECTONE MODEL# IR204C.

3. APARTMENT INTERCOM AMPLIFIER
THE AMPLIFIER SHALL PROVIDE AMPLIFICATION, CONTROL AND POWER CIRCUITS NEEDED TO OPERATE THE ENTIRE INTERCOM SYSTEM. FEATURE INTEGRATED CIRCUIT AMPLIFICTION, INTEGRATED CIRCUIT CALL TONE OSCILLATOR, ADJUSTABLE VOLUME AND TONE VOLUME CONTROLS. PROVIDE AC/DC DOOR RELEASE OPERATION SELECTABLE BY TERMINAL CONNECTION. A STEADY OR WARBLE TONE TO IDENTIFY A CALL FROM THE ENTRANCE PANEL AND/OR CALL BUTTON AT SUITE ENTRANCE. AMPLIFIER SHOULD BE INSTALLED INSIDE THE ENTRANCE PANEL USING OH190 SERIES HOUSING. AMPLIFIER AND PANEL SHOULD BE LOCATED AT LEAST 3' AWAY FROM TRANSFORMER AND OTHER ELECTRICAL EQUIPMENT. AS PER ALPHA COMMUNICATIONS/TEKTONE MODEL# PK543.

4. APARTMENT INTERCOM SWITCHING ADAPTER
THE ADAPTER SHALL PROVIDE AUDIO INTERCOM AND DOOR RELEASE SWITCHING TO THE CALLING ENTRANCE STATION. USED IN ADDITION TO THE SYSTEM AMPLIFIER AND POWER OFF OF THE SAME TRANSFORMER. ONE ADAPTER IS USED ALONG WITH ONE ENTRANCE PANEL FOR ONE ADDITIONAL ENTRANCE ONLY. SHALL BE INSTALLED ADJACENT TO THE INTERCOM AMPLIFIER. AS PER ALPHA COMMUNICATIONS/TECTONE MODEL#PK502B.

5. WIRING
SUITE STATIONS MAY BE CONNECTED IN RISER AS SHOWN IN THE INTERCOM RISER DIAGRAM. EACH RISER REQUIRE ONE TWISTED PAIR, PLUS ONE CONDUCTOR COMMON, PLUS ONE CONDUCTOR PER SUITE FOR SUITE DOOR BUTTON, PLUS ONE CONDUCTOR PER SUITE FOR ENTRANCE PANEL.
TRANSFORMER WIRING SHOULD BE 2 CONDUCTOR, #18. MAXIMUM CABLE RUN IS 80' AND ROUTED AWAY FROM SUITE STATION WIRING. TRANSFORMER ITSELF SHOULD BE INSTALLED NOT CLOSER THAN 3' FROM AMPLIFIER, ENTRANCE PANEL AND WIRING TO AVOID INTERFERENCE. AS PER ALPHA COMMUNICATIONS/TEKTONE MODEL# SS102A OR SS105B.
USE TWISTED PAIR CABLE TO CONNECT APARTMENT STATIONS AND AMPLIFIER, TEMINALS 1 AND 2. DO NOT INTERCHANGE WIRES. CONNECT THE SHIELD TO TERMINAL "G" ON THE AMPLIFIER.
TO AVOID DISTORSIONS AND FEEDBACK DO NOT RUN WIRING FOR STATION COMMONS AND ENTRANCE PANEL SPEAKER IN THE SAME CABLE OR CONDUIT.

Symbol	Description
TC	INTERMATIC 24 HOUR TIMER, MFR. MODEL # T101
CONT	GE CONTACTOR, MECHANICALLY HELD, MFR. MODEL # CR463M80NJA10A0
$_M	MOTION DETECTION ONE-POLE WALL-MOUNTED LIGHT SWITCH
$_K	KEYED ONE-POLE WALL-MOUNTED LIGHT SWITCH

12/17/2015 6:38:05 PM

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SEAL

Accepted For OPPN #1/04 Professional Certification BROOKLYN
Date: DEC 2 3 2015

PROJECT ADDRESS:
1353 FLATBUSH AVENUE BROOKLYN, NY

ELECTRICAL NOTES

DWG No.
EL-002.00

CELLAR LIGHTING ENERGY EFFICIENCY ANALYSIS

INTERIOR LIGHTING ENERGY ANALYSIS (RESIDENTIAL)			
EQUIPMENT TYPE	SIZE CATEGORY	PROPOSED DESIGN VALUE	CODE-PRESCRIBED VALUE AND CITATION
(12) 48X24 FLUORESCENT LIGHT FIXTURES	4-LAMP 32 W ea. FIXTURE WATTAGE 122W TOTAL: 1586 W	2,420W (1.4 kW) PER 5,642.4 SQ.FT. OF CELLAR RESIDENTIAL SPACE	0.7W / SQ.FT. NYS ECCC TABLE 505.5.2 2010
(37) COMPACT FLUORESCENT LIGHT FIXTURES	1-LAMP 13 W ea. FIXTURE WATTAGE 22W TOTAL: 814 W	2,420 W / 5,642.4 SQ.FT. = 0.43 W/SQ.FT.	
(4) EXIT SIGNS	20 W		
CELLAR FLOOR RESIDENTIAL SPACE: COMMERCIAL ENERGY EFFICIENCY SECTION 505.5: PROPOSED POWER DENSITY OF SECTION 505.5.1 IS LESS THAN CODE-PRESCRIBED IN SECTION 505.5.2, AS REQUIRED.			

EXTERIOR LIGHTING ENERGY ANALYSIS (ZONE 2)			
EQUIPMENT TYPE	SIZE CATEGORY	PROPOSED DESIGN VALUE	CODE-PRESCRIBED VALUE AND CITATION
(6) 12'x12' FLUORESCENT LIGHT FIXTURES	1-LAMP 20 W ea. FIXTURE WATTAGE 20W TOTAL: 120 W	40W/FT PER 6 FT OF TOTAL DOOR WIDTH 40 W/FT * 6 FT. = 240 W	600W +20W/FT*6FT= 720W NYS ECCC TABLE 505.6.2.2 2010
CELLAR FLOOR ENTRANCE COMMERCIAL ENERGY EFFICIENCY SECTION 505.6: PROPOSED POWER IS EQUAL TO CODE-PRESCRIBED IN SECTION 505.6 AS REQUIRED.			

ROOF LIGHTING ENERGY EFFICIENCY ANALYSIS

INTERIOR LIGHTING ENERGY ANALYSIS (RESIDENTIAL)			
EQUIPMENT TYPE	SIZE CATEGORY	PROPOSED DESIGN VALUE	CODE-PRESCRIBED VALUE AND CITATION
(1) COMPACT FLUORESCENT LIGHT FIXTURES	1-LAMP 13 W ea. FIXTURE WATTAGE 22W TOTAL: 22 W	66W (0.9 kW) PER 5,358 SQ.FT. OF FIRST FL COMMON RESIDENTIAL SPACE	0.7W / SQ.FT. NYS ECCC TABLE 505.5.2 2010
(2) WALL SCONCE FLUORESCENT LIGHT FIXTURES	1-LAMP 13 W ea. FIXTURE WATTAGE 22W TOTAL: 44 W	66 W / 5,358 SQ.FT. = 0.01 W/SQ.FT.	
ROOF RESIDENTIAL SPACE COMMERCIAL ENERGY EFFICIENCY SECTION 505.5: PROPOSED POWER DENSITY OF SECTION 505.5.1 IS LESS THAN CODE-PRESCRIBED IN SECTION 505.5.2, AS REQUIRED.			

EXTERIOR LIGHTING ENERGY ANALYSIS (ZONE 2)			
EQUIPMENT TYPE	SIZE CATEGORY	PROPOSED DESIGN VALUE	CODE-PRESCRIBED VALUE AND CITATION
(3) 12'x12' FLUORESCENT LIGHT FIXTURES	1-LAMP 20 W ea. FIXTURE WATTAGE 20W TOTAL: 120 W	40W/FT PER 6 FT OF TOTAL DOOR WIDTH 40 W/FT * 6 FT. = 240 W	600W +20W/FT*6FT= 720W NYS ECCC TABLE 505.6.2.2 2010

1ST FL LIGHTING ENERGY EFFICIENCY ANALYSIS

INTERIOR LIGHTING ENERGY ANALYSIS (RESIDENTIAL)			
EQUIPMENT TYPE	SIZE CATEGORY	PROPOSED DESIGN VALUE	CODE-PRESCRIBED VALUE AND CITATION
(39) COMPACT FLUORESCENT LIGHT FIXTURES	1-LAMP 13 W ea. FIXTURE WATTAGE 22W TOTAL: 770 W	1194W (0.9 kW) PER 5,358 SQ.FT. OF FIRST FL COMMON RESIDENTIAL SPACE	0.7W / SQ.FT. NYS ECCC TABLE 505.5.2 2010
(2) INCANDESCENT LIGHT FIXTURES	1-LAMP 40 W ea. FIXTURE WATTAGE 40W TOTAL: 80 W	1194 W / 5,358 SQ.FT. = 0.22 W/SQ.FT.	
(11) 2' FLUORESCENT STRIP LIGHT FIXTURES	1-LAMP 20 W ea. FIXTURE WATTAGE 25W TOTAL: 275 W		
(2) WALL SCONCE FLUORESCENT LIGHT FIXTURES	1-LAMP 13 W ea. FIXTURE WATTAGE 22W TOTAL: 44 W		
(5) EXIT SIGNS	25 W		
1ST FLOOR RESIDENTIAL SPACE COMMERCIAL ENERGY EFFICIENCY SECTION 505.5: PROPOSED POWER DENSITY OF SECTION 505.5.1 IS LESS THAN CODE-PRESCRIBED IN SECTION 505.5.2, AS REQUIRED.			

EXTERIOR LIGHTING ENERGY ANALYSIS (ZONE 2)			
EQUIPMENT TYPE	SIZE CATEGORY	PROPOSED DESIGN VALUE	CODE-PRESCRIBED VALUE AND CITATION
(6) 12'x12' FLUORESCENT LIGHT FIXTURES	1-LAMP 20 W ea. FIXTURE WATTAGE 20W TOTAL: 120 W	40W/FT PER 6 FT OF TOTAL DOOR WIDTH 40 W/FT * 6 FT. = 240 W	600W +20W/FT*6FT= 720W NYS ECCC TABLE 505.6.2.2 2010
FIRST FLOOR ENTRANCE COMMERCIAL ENERGY EFFICIENCY SECTION 505.6: PROPOSED POWER IS EQUAL TO CODE-PRESCRIBED IN SECTION 505.6 AS REQUIRED.			

2ND FL LIGHTING ENERGY EFFICIENCY ANALYSIS TYPICAL FOR 2ND THRU 6TH FLOORS

INTERIOR LIGHTING ENERGY ANALYSIS (RESIDENTIAL)			
EQUIPMENT TYPE	SIZE CATEGORY	PROPOSED DESIGN VALUE	CODE-PRESCRIBED VALUE AND CITATION
(39) COMPACT FLUORESCENT LIGHT FIXTURES	1-LAMP 13 W ea. FIXTURE WATTAGE 22W TOTAL: 858 W	1157W (0.9 kW) PER 5,358 SQ.FT. OF FIRST FL COMMON RESIDENTIAL SPACE	0.7W / SQ.FT. NYS ECCC TABLE 505.5.2 2010
(3) INCANDESCENT LIGHT FIXTURES	1-LAMP 40 W ea. FIXTURE WATTAGE 40W TOTAL: 120 W	1194 W / 5,358 SQ.FT. = 0.21 W/SQ.FT.	
(5) 2' FLUORESCENT STRIP LIGHT FIXTURES	1-LAMP 20 W ea. FIXTURE WATTAGE 25W TOTAL: 125 W		
(2) WALL SCONCE FLUORESCENT LIGHT FIXTURES	1-LAMP 13 W ea. FIXTURE WATTAGE 22W TOTAL: 44 W		
(2) EXIT SIGNS	10 W		
2ND FLOOR RESIDENTIAL SPACE COMMERCIAL ENERGY EFFICIENCY SECTION 505.5: PROPOSED POWER DENSITY OF SECTION 505.5.1 IS LESS THAN CODE-PRESCRIBED IN SECTION 505.5.2, AS REQUIRED.			

EXTERIOR LIGHTING ENERGY ANALYSIS (ZONE 2)			
EQUIPMENT TYPE	SIZE CATEGORY	PROPOSED DESIGN VALUE	CODE-PRESCRIBED VALUE AND CITATION
(3) 12'x12' FLUORESCENT LIGHT FIXTURES	1-LAMP 20 W ea. FIXTURE WATTAGE 20W TOTAL: 120 W	40W/FT PER 6 FT OF TOTAL DOOR WIDTH 40 W/FT * 6 FT. = 240 W	600W +20W/FT*6FT= 720W NYS ECCC TABLE 505.6.2.2 2010

LIGHTING ENERGY EFFICIENCY ANALYSIS

N.T.S.

○	SHALLOW MUSHROOM COMPACT FLUORESCENT FIXTURE 1x13W FLUORESCENT BULB. 120V, 22W. LUMAPRO MOD.NO.3V837 OR EQUAL.	⊢⊣	4' STORAGE FLUORESCENT LIGHT 120V, 40W
⊘	JANITOR CLOSET LIGHT, INCONDESCENT, 40W, 120V	E	INDICATES EMERGENCY LIGHT
▭	HPS, CEILING MOUNTED 70W, 120V	⊗	ELEVATOR PIT LIGHT, INCONDESCENT, 40W,120V
▭ HPS	HPS, WALL MOUNTED 70W,120V, PHOTOSENSOR	▶◀	EXIT LIGHT, LED, 120/277V BY LITHONIA LIGHTING OR EQUAL. ARROW INDICATES SINGLE/DOUBLE FACE
▭	FLUORESCENT, WALL MOUNTED 20W, 120V, PHOTOSENSOR	▭ E	FLUORESCENT TROFFER RECESSED 120V / 122W 24 / 48 / 3 ½
⊢E	2' STAIR CASE FLUORESCENT LIGHT 120V, 25W	◠	DECORATIVE COMPACT FLUORESCENT FIXTURE 1x13W FLUORESCENT BULB. 120V, 22W.
BLANK	BLANK	▭ E	FLUORESCENT TROFFER, RECESSED, 120V/58W 12 / 48 / 4 ½

LIGHTING FIXTURE SCHEDULE

N.T.S.

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SEAL

NO.	REVISIONS BY	DATE
1		

Accepted For OPPN #1/16
Professional Certification
BROOKLYN
Date: DEC 23 2015

PROJECT ADDRESS:
1353
FLATBUSH AVENUE
BROOKLYN, NY

ELECTRICAL ENERGY EFFICIENCY LIGHTING FIXTURE SCHEDULE

DWG No
EL-100.00

DEPT BLDGS Job No: 310131870
Scan Date: 03/15/2016 00:00

PAID

THE IMPLEMENTATION OF THESE DRAWINGS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BRING TO ARCHITECT'S ATTENTION IN WRITING ANY DISCREPANCIES IN THESE PLANS. THE CONTRACTOR SHALL SUBMIT TO ARCHITECT FOR APPROVAL ALL SHOP DRAWINGS AND SPECIFICATIONS RELATED TO THIS PROJECT.

AREA WEIGHTED AVARAGE CALCULATION

	AREA A	U-FACTOR (PROPOSED) B	UA (PROPOSED) C = A*B	U-FACTOR (CODE MAX) D	UA (CODE) E = A*D
WALL A	685.84	0.018	12.35	0.064	43.89
WALL B	1783.59	0.018	32.10	0.064	114.15
WALL C	343.56	0.018	6.18	0.064	21.99
WALL D	377.99	0.018	6.80	0.064	24.19
WALL E	5118.75	0.018	92.14	0.064	327.60
WALL F	388.55	0.018	6.99	0.064	24.87
WALL G	191.44	0.018	3.45	0.064	12.25
WALL H	238.75	0.018	4.30	0.064	15.28
WALL I	352.03	0.018	6.34	0.064	22.53
WALL J	2513.33	0.018	45.24	0.064	160.85
WALL K	143.36	0.018	2.58	0.064	9.18
WALL L	1338.47	0.018	24.09	0.064	85.66
WALL M	81.59	0.018	1.47	0.064	5.22
WALL N	110.00	0.018	1.98	0.064	7.04
WALL O	1432.30	0.018	25.78	0.064	91.67
WALL P	753.58	0.018	13.56	0.064	48.23
WALL Q	188.89	0.018	3.40	0.064	12.09
WALL R	738.50	0.018	13.29	0.064	47.26
WALL S	779.16	0.018	14.02	0.064	49.87
WALL T	183.33	0.018	3.30	0.064	11.73
WALL U	380.67	0.018	7.01	0.064	24.94
WALL V	60.75	0.018	1.09	0.064	3.89
WALL W	57.95	0.018	1.04	0.064	3.71
WALL X	620.50	0.018	11.17	0.064	39.71
OPAQUE WALL TOTAL	18871.88		339.69		1207.80
WALL A - WIN. 10	662.91	0.21	139.21	0.40	265.16
WALL B - WIN. 01	1349.72	0.21	283.44	0.40	539.89
WALL B - WIN. 03	358.33	0.21	75.25	0.40	143.33
WALL B - WIN. 1ST FL.	841.69	0.28	235.67	0.40	336.68
WALL C - WIN. 05	668.88	0.23	140.46	0.40	267.55
WALL C - WIN. 1ST FL.	244.22	0.28	68.38	0.40	97.69
WALL D - WIN. 04	477.77	0.21	100.33	0.40	191.11
WALL D - WIN. 1ST FL.	31.66	0.28	8.86	0.40	12.66
WALL D - WIN. 1ST FL.	43.61	0.28	12.21	0.40	17.44
WALL D - Entry Door. 1ST FL.	92.77	0.32	29.69	0.40	37.11
WALL E	0.00	0.00	0.00	0.40	0.00
WALL F - WIN. 00	134.97	0.21	28.34	0.40	53.99
WALL F - WIN. 00	103.72	0.21	21.78	0.40	41.09
WALL F - WIN. 1ST FL.	227.12	0.28	63.59	0.40	90.85
WALL F - WIN. 1ST FL.	49.37	0.28	13.82	0.40	19.73
WALL F - WIN. 1ST FL.	116.30	0.28	32.56	0.40	46.52
WALL F - DOOR. 1ST FL.	46.38	0.48	22.26	0.40	18.55
WALL G - WIN. 1ST FL.	314.90	0.28	88.17	0.40	125.96
WALL G - WIN. 1ST FL.	72.41	0.28	20.27	0.40	28.96
WALL H	0.00	0.00	0.00	0.40	0.00
WALL I - WIN. 1ST FL.	247.97	0.28	69.43	0.40	99.19
WALL I	0.00	0.00	0.00	0.40	0.00
WALL K - WIN. 00	134.97	0.21	28.34	0.40	53.99
WALL L - WIN. 00	74.05	0.21	15.55	0.40	29.62
WALL L - WIN. 00	630.66	0.21	132.44	0.40	252.26
WALL L - WIN. 00	256.80	0.21	53.93	0.40	102.72
WALL L - WIN. 00	68.08	0.21	14.30	0.40	27.23
WALL L - DOOR 00	594.44	0.48	285.33	0.40	237.78
WALL M - WIN. 00	50.76	0.21	10.66	0.40	20.30
WALL M - WIN. 00	34.04	0.21	7.15	0.40	13.62
WALL M - DOOR 00	148.61	0.48	71.33	0.40	59.44
WALL N	0.00	0.00	0.00	0.40	0.00
WALL O - WIN. 00	394.16	0.21	82.77	0.40	157.66
WALL O - WIN. 00	359.52	0.21	75.50	0.40	143.81
WALL O - WIN. 00	340.41	0.21	71.49	0.40	136.16
WALL O - DOOR 00	148.61	0.48	71.33	0.40	59.44
WALL P - WIN. 00	67.48	0.21	14.17	0.40	26.99
WALL P - WIN. 00	52.55	0.21	11.04	0.40	21.02
WALL P - DOOR 00	29.72	0.48	14.27	0.40	11.89
WALL Q - DOOR 00	148.61	0.48	71.33	0.40	59.44
WALL R - DOOR 00	436.91	0.48	209.72	0.40	174.76
WALL S	0.00	0.00	0.00	0.40	0.00
WALL T	0.00	0.00	0.00	0.40	0.00
WALL U - WIN. 00	51.56	0.21	10.83	0.40	20.62
WALL U - WIN. 00	31.05	0.21	6.52	0.40	12.42
WALL U - DOOR 00	133.75	0.48	64.20	0.40	53.50
WALL V - WIN. 00	132.58	0.21	27.84	0.40	53.03
WALL W - WIN. 00	52.55	0.21	11.04	0.40	21.02
WALL W - DOOR 00	107.00	0.48	51.36	0.40	42.80
WALL X - WIN. 00	356.33	0.21	116.79	0.40	222.16
FENESTRATION TOTAL	11118.73		2982.77		4447.49
EXTERIOR TOTAL GROSS	29990.61		3322.47		5655.29

ENERGY EFFIENCY OF OPAQUE WALL COMPARING PROPOSED WITH CODE REQUIREMENTS

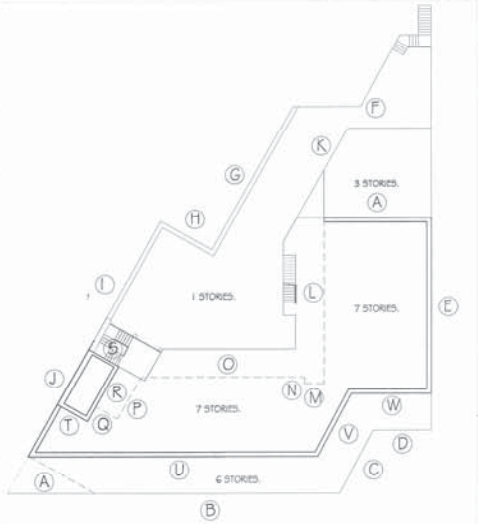
TOTAL UA OPAQUE WALL (PROPOSED) / TOTAL UA OPAQUE WALL (CODE) = 339.69 / 1207.80 x 100 =	28.13 %
ENERGY EFFICIENCY ALLOWABLE PER ZR 12-10 (12)(ii)(3)=	80.00 %

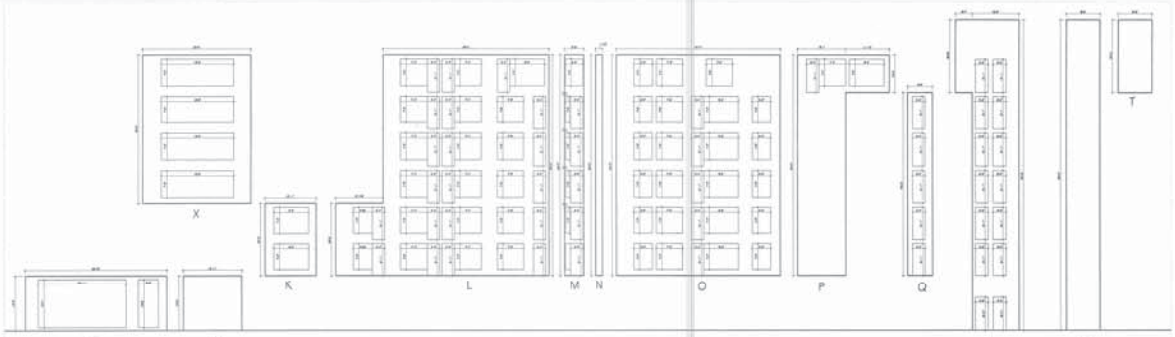
ENERGY EFFIENCY OF GROSS WALL COMPARING PROPOSED WITH CODE REQUIREMENTS

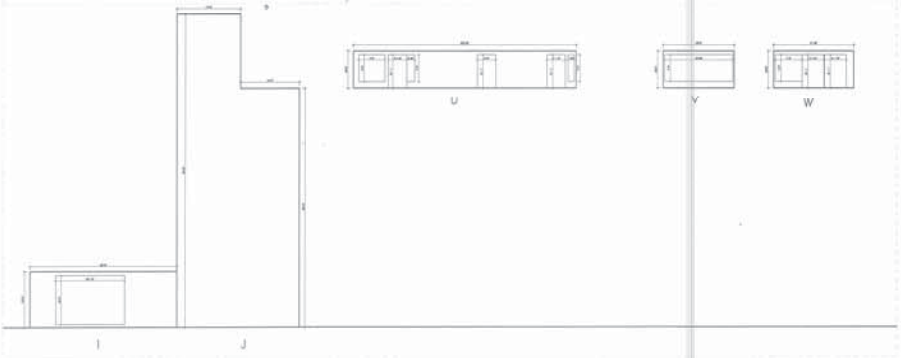
EXT. GROSS WALL UA (PROPOSED) / EXT. GROSS WALL UA (CODE) = 3322.47 / 5655.29 x 100 =	70.00 %
ENERGY EFFICIENCY ALLOWABLE PER ZR 12-10 (12)(iii)(2)=	90.00 %

VERTICAL FENESTRATION AREA ALLOWED

TOTAL FENESTRATION (PROPOSED) / EXT. GROSS WALL (PROPOSED) = 11118.73 / 29990.61 x 100 =	37.07 %
VERTICAL FENESTRATION AREA ALLOWED PER NYECC 502.1.2	40.00 %







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SEAL

Accepted For OPPN #1/04
Professional Certification
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Date: DEC 2 0 2019

ALEXANDER L. HIRSCH
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DESIGN & ZONING CONSULTANT

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PROJECT ADDRESS:
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FLATBUSH AVENUE
BROOKLYN, NY

FENESTRATION COMPLIANCE

DWG No:
EN-001.00

DEP BOOK/Job No. 310131073
Appt. Date 12/20/2019
PAID:

ARCHITECT/ENGENEER SHALL NOT HAVE CONTROL, CHARGE OF AND NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, DEVIATIONS, TECHNIQUES, SEQUENCES, PROCEDURES, SAFETY PRECAUTIONS AND/OR PROGRAMS IN CONNECTION WITH THE WORK, ACTS, OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS OR ANY OTHER PERSON PERFORMING ANY OF THE WORK, AND/OR FOR FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO HIRE PRIOR TO COMMENCEMENT OF ANY WORK AN INDEPENDENT ARCHITECT/ ENGINEER TO PERFORM CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE NYC BUILDING CODE. THE ARCHITECT / ENGINEER PERFORMING THE CONTROL INSPECTIONS SHALL INSPECT THE SITE TO INSURE THE SAFETY OF THE SITE, QUALITY OF WORK, COMPLIANCE TO NYC BUILDING CODE, ZONING RESOLUTION, AND / OR ANY APPLICABLE CODE IN ACCORDANCE WITH CONTRACT DOCUMENTS. THE ARCHITECT/ENGINEER, PERFORMING CONTROL INSPECTIONS SHALL SUBMIT THE CONTROL INSPECTIONS, PROGRESS REPORT AND ALL FINDINGS OF THE WORKSITE TO THE DEPARTMENT OF BUILDINGS.

THE IMPLEMENTATION OF THESE DRAWINGS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BRING TO ARCHITECT'S ATTENTION IN WRITING ANY DISCREPANCIES IN THESE PLANS. THE CONTRACTOR SHALL SUBMIT TO ARCHITECT FOR APPROVAL ALL SHOP DRAWINGS AND SPECIFICATIONS RELATED TO THIS PROJECT.

ENERGY CONSERVATION NOTES:

TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2011 NEW YORK CITY ENERGY CONSERVATION CODE.

BUILDING ENVELOPE REQUIREMENTS:

1. ALL JOINTS AND PENETRATIONS IN THE BUILDING ENVELOPE THAT ARE POTENTIAL SOURCES OF AIR LEAKAGE MUST BE CAULKED, GASKETED, OR COVERED WITH A MOISTURE VAPOR-PERMEABLE WRAPPING MATERIAL.

2. RECESSED LIGHTING FIXTURES MUST BE GASKETED AND IC RATED; I.E., RATED FOR DIRECT CONTACT WITH INSULATION.

3. THE FOLLOWING AREAS MUST BE SEALED:
- EXTERIOR JOINTS AROUND WINDOW AND DOOR FRAMES
- BETWEEN WALL SOLE PLATES, FLOORS, AND EXTERIOR-WALL PANELS
- OPENINGS FOR PLUMBING, ELECTRICITY, AND REFRIGERANT AND GAS LINES IN EXTERIOR WALLS, FLOORS, AND ROOFS
- OPENINGS IN ATTIC FLOORS (SUCH AS WHERE CEILING PANELS MEET INTERIOR AND EXTERIOR WALLS AND MASONRY FIREPLACES)
- SERVICE AND ACCESS DOORS OR HATCHES
- ALL OTHER SIMILAR OPENINGS IN THE BUILDING ENVELOPE.

4. FOLLOW ARCHITECTURAL PLANS FOR INSULATION R-VALUES AND GLAZING SHGC & U-FACTORS.

5. EXCEPT AS NOTED BELOW, VAPOR RETARDERS MUST BE INSTALLED IN ALL NONVENTED FRAMED AREAS IN CEILINGS, WALLS, AND FLOORS. THE VAPOR RETARDER MUST HAVE A PERM RATING OF 1.0 OR LESS AND MUST BE INSTALLED ON THE WARM-IN-WINTER SIDE OF THE INSULATION (BETWEEN THE INSULATION AND CONDITIONED SPACE).
EXCEPTION : VAPOR RETARDERS ARE NOT REQUIRED WHERE MOISTURE OR ITS FREEZING WILL NOT DAMAGE MATERIALS.

6. FIELD CERTIFICATION OF INSTALLED COMPONENTS IS REQUIRED AND CAN BE PROVIDED THROUGH PRODUCT LABELS PRINTED ON DIFFERENT MATERIALS.

BUILDING MECHANICAL REQUIREMENTS:

1. ALL EQUIPMENT AND SYSTEMS MUST BE SIZED TO BE NO GREATER THAN PROPOSED ON MECHANICAL PLANS.

2. EACH HEATING OR COOLING SYSTEM SERVING A SINGLE ZONE MUST HAVE ITS OWN TEMPERATURE CONTROL DEVICE.

3. THERMOSTATS CONTROLLING BOTH HEATING AND COOLING MUST BE CAPABLE OF HAVING A 5 DEG. F DEADBAND. OR RANGE OF TEMPERATURE WHERE NO HEATING OR COOLING IS AVAILABLE.

4. THE SYSTEM MUST SUPPLY OUTSIDE VENTILATION AIR AS REQUIRED BY CHAPTER 4 OF THE INTERNATIONAL MECHANICAL CODE. IF THE VENTILATION SYSTEM IS DESIGNED TO SUPPLY OUTDOOR AIR QUANTITIES EXCEEDING MINIMUM REQUIRED LEVELS, THE SYSTEM MUST BE CAPABLE OF REDUCING OUTDOOR-AIR FLOW THE THE MINIMUM REQUIRED LEVELS. SEE MECHANICAL PLANS.

5. OUTDOOR-AIR SUPPLY SYSTEMS WITH DESIGN AIR FLOW RATES GREATER THAN 3000 CU FT PER MINUTE OF OUTDOOR AIR AND ALL EXHAUST SYSTEMS MUST HAVE DAMPERS THAT AUTOMATICALLY CLOSE WHILE THE EQUIPMENT IS NOT OPERATING.

6. SUPPLY AND RETURN AIR DUCTS FOR CONDITIONED AIR, LOCATED IN UNCONDITIONED SPACE MUST BE INSULATED WITH A MINIMUM OF R-5.

7. SUPPLY AND RETURN AIR DUCTS AND PLENUMS MUST BE INSULATED TO A MIN. OF R-8 WHEN LOCATED OUTSIDE THE BUILDING ENVELOPE.

8. ALL JOINTS, LONGITUDINAL AND TRANSVERSE SEAMS AND CONNECTIONS IN DUCTWORK MUST BE SECURELY SEALED USING WELDMENTS, MECHANICAL FASTENERS WITH SEALS OR GASKETS OR MASTICS, MESH AND MASTIC SEALING SYSTEMS OR TAPES. TAPES AND MASTICS MUST BE LISTED AND LABELED IN ACCORDANCE WITH UL 181A OR UL 181B.

9. DUCTS MUST BE CONNECTED TO FANS AND OTHER AIR DISTRIBUTION EQUIPMENT, INCLUDING MULTI-ZONE TERMINAL UNITS, USING MECHANICAL FASTENERS WITH SEALS, MASTICS OR GASKETS.

10. EACH SUPPLY AIR OUTLET OR DIFFUSER AND EACH ZONE TERMINAL DEVICE (SUCH AS VAV OR MIXING BOXES) MUST HAVE ITS OWN BALANCING DEVICE. ACCEPTABLE BALANCING DEVICES INCLUDE ADJUSTABLE DAMPERS LOCATED WITHIN THE DUCTWORK, TERMINAL DEVICES OR SUPPLY AIR DIFFUSER.

11. ALL PIPES SERVING SPACE CONDITIONING SYSTEMS MUST BE INSULATED TO THE FOLLOWING LEVELS:

FLUID	PIPE DIAMETER <= 1.5"	PIPE DIAMETER > 1.5"
HOT WATER	1.0"	2.0"
STEAM	1.5"	3.0"
CHILED WATER, BRINE, REFRIGERANT	1.0"	1.5"

12. UPON PURCHASE OF MECHANICAL EQUIPMENT, THE OWNER SHALL BE PROVIDED WITH OPERATION AND MAINTENANCE DOCUMENTATION THAT PROVIDES THE FOLLOWING INFORMATION:

- EQUIPMENT INPUT AND OUTPUT CAPACITY AND REQUIRED MAINTENANCE ACTIONS.
- EQUIPMENT OPERATION AN MAINTENANCE MANUALS.
- HVAC SYSTEM CONTROL MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL
SEQUENCE DESCRIPTIONS. DESIRED OR FIELD DETERMINED SET POINTS MUST BE PERMANENTLY RECORDED ON CONTROL DRAWINGS,
AT CONTROL DEVICES, OR, FOR DIGITAL CONTROL SYSTEMS, IN PROGRAMMING COMMENTS.
- A NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE.

WINDOW ENERGY REPORT

SERIES	PRODUCT TYPE	GLASS TYPE	GRILLE	U-FACTOR(1)	SHGC(2)	VT(3)	ENERGY STAR ZONE(4)
ANDERSEN® 400 SERIES PRODUCTS							
	AWNING 400 BASIC	HP LOW-E4(R)	NO	0.28	0.31	0.53	AB
	CASEMENT 400 BASIC	HP LOW-E4(R)	NO	0.28	0.32	0.54	AB
	WOODWRIGHT DH 400 DOUBLE-HUNG	HP LOW-E4(R)	NO	0.30	0.31	0.53	AB

(1) U-FACTOR DEFINES THE AMOUNT OF HEAT LOSS THROUGH THE TOTAL UNIT IN BTU/HR SQ. FT. °F. THE LOWER THE VALUE, THE LESS HEAT IS LOST THROUGH THE ENTIRE PRODUCT. WINDOW VALUES REPRESENT NON-TEMPERED GLASS. USE OF TEMPERED GLA AND/OR CAPILLARY BREATHER TUBES FOR HIGH ALTITUDE CAN INCREASE U-FACTOR RATINGS. SEE ANDERSENWINDOWS.COM FOR SPECIFIC PERFORMANCE VALUES. DOOR VALUES REPRESENT TEMPERED GLASS.

(2) SOLAR HEAT GAIN COEFFICIENT (SHGC) DEFINES THE FRACTION OF SOLAR RADIATION ADMITTED THROUGH THE GLASS BOTH DIRECTLY TRANSMITTED AND ABSORBED AND SUBSEQUENTLY RELEASED INWARD. THE LOWER THE VALUE, THE LESS HEAT IS TRANSMITTED THROUGH THE PRODUCT.

(3) VISIBLE TRANSMITTANCE (VT) MEASURES HOW MUCH LIGHT COMES THROUGH A PRODUCT (GLASS AND FRAME). THE HIGHER THE VALUE, FROM 0 TO 1, THE MORE DAYLIGHT THE PRODUCT LETS IN OVER THE PRODUCTS TOTAL UNIT AREA. VISIBLE TRANSMITTANCE IS MEASURED OVER THE 380 TO 760 NANOMETER PORTION OF THE SOLAR SPECTRUM.

(4) ENERGY STAR QUALIFICATION HELPS IDENTIFY THE WINDOW AND DOOR THAT IS BEST FOR EACH CLIMATE ZONE. PRODUCTS THAT BEAR THE ENERGY STAR LOGO MUST MEET STRINGENT ENERGY EFFICIENCY GUIDELINES SET BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY AND THE U.S. DEPARTMENT OF ENERGY. THESE GUIDELINES ARE BASED ON THE HEAT GAIN AND LOSS OF EACH PRODUCT IN VARIOUS REGIONS OF THE COUNTRY.
A NORTHERN CLIMATE ZONE (MOSTLY HEATING)
B NORTHCENTRAL CLIMATE ZONE (HEATING AND COOLING)
C SOUTHCENTRAL CLIMATE ZONE (COOLING AND HEATING)
D SOUTHERN (MOSTLY COOLING)

FOR NFRC CERTIFIED TOTAL UNIT PERFORMANCE ON UNITS WITH CAPILLARY BREATHER TUBES FOR HIGH ALTITUDES, PLEASE VISIT ANDERSENWINDOWS.COM.

"HIGH-PERFORMANCE(TM) LOW-E4(R)" (HP LOW-E4), "HIGH-PERFORMANCE(TM) LOW-E4(R) SMARTSUN(TM)" (HP LOW-E4 SMARTSUN) AND "HIGH-PERFORMANCE(TM) LOW-E4(R) SUN" (HP LOW-E4 SUN) ARE ANDERSEN TRADEMARKS FOR "LOW-E" GLASS.

NFRC RATINGS ARE BASED ON MODELING BY A THIRD PARTY AGENCY AS VALIDATED BY AN INDEPENDENT TEST LAB IN COMPLIANCE WITH NFRC PROGRAM AND PROCEDURAL REQUIREMENTS.

LIST OF ENERGY CODE PROGRESS INSPECTION - COMMERCIAL BUILDINGS

	INSPECTION/TEST	FREQUENCY (MINIMUM)	REFERENCE STANDARD (SEE ECC CHAPTER 6) OR OTHER CRITERIA	ECC OR OTHER CITATION
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, CRAWL-SPACE WALLS AND/OR THE PERIMETER OF SLAB-ON-GRADE FLOORS.	AS REQUIRED DURING FOUNDATION WORK AND PRIOR TO BACKFILL	APPROVED CONSTRUCTION DOCUMENTS	303.2.1; ASHRAE 90.1 - 5.8.1.7
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 AND 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 TABLES 303.1.3(1), (2) AND (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, 303.1.3, 502.3; ASHRAE 90.1 -5.5; 5.6 OR 11; 5.8.2
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; PRIOR TO FINAL CONSTRUCTION INSPECTION	NFRC 400, AAMA/WDMA/CSA 101/I.S.2/A440 ASTM E283, ANSI/DASMA 105	502.4; ASHRAE 90.1 -5.4.3.2
IIA5	FENESTRATION AREAS: DIMENSIONS OF WINDOWS, DOORS AND SKYLIGHTS SHALL BE VERIFIED BY VISUAL INSPECTION.	PRIOR TO FINAL CONSTRUCTION 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 AND MEETS THE REQUIREMENTS OF THE STANDARD, IN ACCORDANCE WITH THE STANDARD(S) CITED IN THE APPROVED PLANS.	AS REQUIRED DURING CONSTRUCTION	APPROVED CONSTRUCTION DOCUMENTS; ASTM E2178, ASTM E2357, ASTM E1677, ASTM E779, ASTM E283.	502.4.3, 502.4.7; ASHRAE 90.1 - 5.4.3.1
IIB	MECHANICAL AND SERVICE WATER HEATING INSPECTIONS			
IIB2	OUTDOOR AIR INTAKES AND EXHAUST OPENINGS: DAMPERS FOR STAIR AND ELEVATOR SHAFT VENTS AND OTHER OUTDOOR AIR INTAKES AND EXHAUST OPENINGS INTEGRAL TO THE BUILDING ENVELOPE SHALL BE VISUALLY INSPECTED TO VERIFY THAT SUCH DAMPERS, EXCEPT WHERE PERMITTED TO BE GRAVITY DAMPERS, COMPLY WITH APPROVED CONSTRUCTION DRAWINGS. MANUFACTURER'S LITERATURE SHALL BE REVIEWED TO VERIFY THAT THE PRODUCT HAS BEEN TESTED AND FOUND TO MEET THE STANDARD.	AS REQUIRED DURING INSTALLATION	APPROVED CONSTRUCTION DOCUMENTS; AMCA 500D	502.4.4; ASHRAE 90.1 - 6.4.3.4
IIB3	HVAC, SERVICE WATER HEATING AND POOL EQUIPMENT SIZING AND PERFORMANCE: EQUIPMENT SIZING, EFFICIENCIES AND OTHER PERFORMANCE FACTORS OF ALL MAJOR EQUIPMENT UNITS, AS DETERMINED BY THE APPLICANT OF RECORD, AND NO LESS THAN 15% OF MINOR EQUIPMENT UNITS, SHALL BE VERIFIED BY VISUAL INSPECTION AND, WHERE NECESSARY, REVIEW OF MANUFACTURER'S DATA.	PRIOR TO FINAL PLUMBING AND CONSTRUCTION INSPECTION	APPROVED CONSTRUCTION DOCUMENTS;	503.2, 504.2, 504.7; ASHRAE 90.1 - 6.3, 6.4.1, 6.4.2, 6.8; 7.4, 7.8
IIB4	HVAC SYSTEM CONTROLS AND ECONOMIZERS AND SERVICE HOT WATER SYSTEM CONTROLS: NO LESS THAN 20% OF EACH TYPE OF REQUIRED CONTROLS AND ECONOMIZERS SHALL BE VERIFIED BY VISUAL INSPECTION AND TESTED FOR FUNCTIONALITY AND PROPER OPERATION. SUCH CONTROLS SHALL INCLUDE, BUT ARE NOT LIMITED TO: • THERMOSTATIC • SET POINT OVERLAP RESTRICTION • OFF-HOUR • SHUTOFF DAMPER • SNOW-MELT SYSTEM • DEMAND CONTROL SYSTEMS • OUTDOOR HEATING SYSTEMS • ZONES • ECONOMIZERS • AIR SYSTEMS • VARIABLE AIR VOLUME FAN • HYDRONIC SYSTEMS • HEAT REJECTION EQUIPMENT FAN SPEED • COMPLEX MECHANICAL SYSTEMS SERVING MULTIPLE ZONES • VENTILATION • ENERGY RECOVERY SYSTEMS • HOT GAS BYPASS LIMITATION • TEMPERATURE • SERVICE WATER HEATING • HOT WATER SYSTEM • POOL HEATER AND TIME SWITCHES • EXHAUST HOODS • RADIANT HEATING SYSTEMS. CONTROLS WITH SEASONALLY DEPENDENT FUNCTIONALITY: CONTROLS WHOSE COMPLETE OPERATION CANNOT BE DEMONSTRATED DUE TO PREVAILING WEATHER CONDITIONS TYPICAL OF THE SEASON DURING WHICH PROGRESS INSPECTIONS WILL BE PERFORMED SHALL BE PERMITTED TO BE SIGNED OFF FOR THE PURPOSE OF A TEMPORARY CERTIFICATE OF OCCUPANCY WITH ONLY A VISUAL INSPECTION, PROVIDED, HOWEVER, THAT THE PROGRESS INSPECTOR SHALL PERFORM A SUPPLEMENTAL INSPECTION WHERE THE CONTROLS ARE VISUALLY INSPECTED AND TESTED FOR FUNCTIONALITY AND PROPER OPERATION DURING THE NEXT IMMEDIATE SEASON THEREAFTER. THE OWNER SHALL PROVIDE FULL ACCESS TO THE PROGRESS INSPECTOR WITHIN TWO WEEKS OF THE PROGRESS INSPECTORS REQUEST FOR SUCH ACCESS TO PERFORM THE PROGRESS INSPECTION. FOR SUCH SUPPLEMENTAL INSPECTIONS, THE DEPARTMENT SHALL BE NOTIFIED BY THE APPROVED PROGRESS INSPECTION AGENCY OF ANY UNRESOLVED DEFICIENCIES IN THE INSTALLED WORK WITHIN 180 DAYS OF SUCH SUPPLEMENTAL INSPECTION.	AFTER INSTALLATION AND PRIOR TO FINAL ELECTRICAL AND CONSTRUCTION INSPECTION, EXCEPT THAT FOR CONTROLS WITH SEASONALLY DEPENDENT FUNCTIONALITY, SUCH TESTING SHALL BE PERFORMED BEFORE SIGN-OFF FOR ISSUANCE OF A FINAL CERTIFICATE OF OCCUPANCY	APPROVED CONSTRUCTION DOCUMENTS, INCLUDING CONTROL SYSTEM NARRATIVES; ASHRAE GUIDELINE 1: THE HVAC COMMISSIONING PROCESS WHERE APPLICABLE	503.2.4, 503.2.5.1, 503.2.11, 503.3, 503.4, 504.3, 504.6, 504.7; ASHRAE 90.1 - 6.3, 6.4, 6.5, 6.7.2.4, 7.4.4, 7.4.5
IIB5	DUCT, PLENUM AND PIPING INSULATION AND SEALING: INSTALLED DUCT AND PIPING INSULATION SHALL BE VISUALLY INSPECTED TO VERIFY PROPER INSULATION PLACEMENT AND VALUES. JOINTS, LONGITUDINAL AND TRANSVERSE SEAMS AND CONNECTIONS IN DUCTWORK SHALL BE VISUALLY INSPECTED FOR PROPER SEALING.	AFTER INSTALLATION AND PRIOR TO CLOSING SHAFTS, CEILINGS AND WALLS	APPROVED CONSTRUCTION DOCUMENTS; SMACNA DUCT CONSTRUCTION STANDARDS, METAL AND FLEXIBLE	503.2.7, 503.2.8, 504.5; ASHRAE 90.1 - 6.3, 6.4.4.2, 6.8.2, 6.8.3; 7.4.3
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	505.5.3
IIC3	INTERIOR LIGHTING POWER: INSTALLED LIGHTING SHALL BE VERIFIED FOR COMPLIANCE WITH THE LIGHTING POWER ALLOWANCE 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; 1 RCNY §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	505.6; ASHRAE 90.1 - 9.4.4, 9.4.5; 1 RCNY §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
IID	OTHER			
IID1	MAINTENANCE INFORMATION: MAINTENANCE MANUALS FOR MECHANICAL, SERVICE HOT WATER AND ELECTRICAL EQUIPMENT AND SYSTEMS REQUIRING PREVENTIVE MAINTENANCE SHALL BE REVIEWED FOR APPLICABILITY TO INSTALLED EQUIPMENT AND SYSTEMS BEFORE SUCH MANUALS ARE PROVIDED TO THE OWNER. LABELS REQUIRED FOR SUCH EQUIPMENT OR SYSTEMS SHALL BE INSPECTED FOR ACCURACY AND COMPLETENESS.	PRIOR TO SIGN-OFF OR ISSUANCE OF FINAL CERTIFICATE OF OCCUPANCY	APPROVED CONSTRUCTION DOCUMENTS, INCLUDING ELECTRICAL DRAWINGS WHERE APPLICABLE; ASHRAE GUIDELINE 4: PREPARATION OF OPERATING AND MAINTENANCE DOCUMENTATION FOR BUILDING SYSTEMS	503.3, 503.2.9.3; ASHRAE 90.1 - 4.2.2.3, 6.7.2.2, 8.7.2

ARCHITECT/ENGINEER SHALL NOT HAVE CONTROL, CHARGE OF AND NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, DEVIATIONS, TECHNIQUES, SEQUENCES, PROCEDURES, SAFETY PRECAUTIONS AND/OR PROGRAMS IN CONNECTION WITH THE WORK, ACTS, OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS OR ANY OTHER PERSON PERFORMING ANY OF THE WORK, AND/OR FOR FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO HIRE PRIOR TO COMMENCEMENT OF ANY WORK AN INDEPENDENT ARCHITECT/ENGINEER TO PERFORM CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE NYC BUILDING CODE. THE ARCHITECT / ENGINEER PERFORMING THE CONTROL INSPECTIONS SHALL INSPECT THE SITE TO INSURE THE SAFETY OF THE SITE, QUALITY OF WORK, COMPLIANCE TO NYC BUILDING CODE, ZONING RESOLUTION, AND / OR ANY APPLICABLE CODE IN ACCORDANCE WITH CONTRACT DOCUMENTS. THE ARCHITECT/ENGINEER, PERFORMING CONTROL INSPECTIONS SHALL SUBMIT THE CONTROL INSPECTIONS, PROGRESS REPORT AND ALL FINDINGS OF THE WORKSITE TO THE DEPARTMENT OF BUILDINGS.

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SEAL

Accepted For OP. N #1/04
Professional Certification
BROOKLYN
Date: DEC 23 2015

ALEXANDER L. HIRSCH
AIA ASSOCIATE
DESIGN & ZONING CONSULTANT

BDP EXPEDITERS GROUP
6014 11th Ave Suite 310, Brooklyn, NY 11219
tel: 718.436.4060
www.bdpexpediters.com
permits@bdpexpediters.com

PROJECT ADDRESS:
1353 FLATBUSH AVENUE
BROOKLYN, NY

GENERAL NOTES
TR8 - TABULAR

DWG No
EN-002.00

DEPT BLDGS Job No: 310131675
Scan Code: ESH56354514

PAGE:

THE IMPLEMENTATION OF THESE DRAWINGS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BRING TO ARCHITECT'S ATTENTION IN WRITING ANY DISCREPANCIES IN THESE PLANS. THE CONTRACTOR SHALL SUBMIT TO ARCHITECT FOR APPROVAL ALL SHOP DRAWINGS AND SPECIFICATIONS RELATED TO THIS PROJECT.

General Notes:

1. It shall be the owner's responsibility to hire an independent professional engineer licensed by NY State Board of Ed, and approved by NYC for special inspections, to perform all required special inspections as per NYC Building Code.
2. Refer to section 3309 of the NYC building code on SOE-005 and OSHAS regulations on SOE-066 for rules and regulations on protection of an excavation site.
3. There shall be a pre-construction meeting with the owner, PE/RA on record, special inspection engineer, general contractor and sub contractors prior to commencement of this project.
4. All test pits, borings, and all phases of shoring, excavation, and underpinning operations should be performed with the presence of the special inspection engineer.
5. The contractor shall request permission from adjacent property owner to enter buildings directly adjacent to the areas of proposed underpinning to perform the required inspections and observations, and to obtain permission to perform the underpinning work.
6. All adjacent properties, including but not limited to exterior walls and footing shall be observed by the contractor and special inspection engineer, prior to commencement of excavation shoring and/or underpinning work.
7. The contractor and sub-contractor should have completed no less than five underpinning projects of a comparable size to this project, and must have at least five years experience in this type of work.

Excavation and Shoring Notes:

1. Each side of an excavation or trench that is 5 feet or deeper must be protected by shoring/bracing and sheeting, or be sloped unless it is cut from rock.
2. Each excavation pit should be braced to prevent any loss of soil beneath adjoining property.
3. Each open side of an excavation or trench shall have a min. 3'-6" height guardrail or a solid enclosure.
4. Each excavation or trench shall have a way out, such as a ladder or ramp.
5. Contractor shall perform a regular inspections the walls of an excavation or trench for cracks, bulges, spalling and check the shoring for signs of distress- especially after a rainstorm.
6. Soldier piles to be ASTM A-36 steel
7. Lagging to be 3" undressed timber with fb=1200 psi minimum.
8. Soldier piles, timber lagging to be abandoned in place.
9. If water is encountered in the pit, provide a well point near the pit. The special inspection engineer shall determine the location(s) of the well point(s) and the method(s) of removing water from the pit.
10. Do not work on an excavation or trench filled with running or standing water.
11. Do not work in an excavation or trench that is not properly protected.
12. Do not store spoil materials or equipment along the edge of an excavation or trench.
13. Do not drive or park vehicles along the edge of an excavation or trench.

*Base plan provided by Leonard J. Strandberg and Associates entitled Architectural Survey of Described Property, dated 1/6/2015.

BORING AND TEST PIT LOCATION PLAN

GTA
211-K Gates Road
Little Ferry, New Jersey 07643
(201) 641 1650
fax (201) 641-1652

GTA ENGINEERING SERVICES OF NEW YORK, P.C.

LEGEND:

B-1 — Indicates the numbers and approximate locations of test borings performed for this study.

TP-1 — Indicates the numbers and approximate locations of test pits performed for this study.

1353 - 1357 Flatbush Avenue

Borough of Brooklyn
Kings County, New York

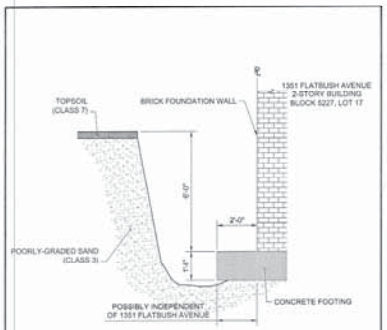
Prepared For: Hello Living

DESIGN BY: *	DRAWN BY: TG	REVIEWED BY: RD
SCALE: NTS	DATE: OCT 2015	PROJECT: 34161921

Figure 2

LOG OF TEST PIT NO. TP-1

PROJECT: 1353-1357 FLATBUSH AVENUE — PROJECT NO.: 34161921
PROJECT LOCATION: BROOKLYN, NEW YORK
CLIENT: HELLO LIVING
DATE STARTED: 10/20/2015 — GROUNDWATER ENCOUNTERED: NE
DATE COMPLETED: 10/20/2015 — GROUND SURFACE ELEVATION: 27.5± — DATUM: NAVD 88
CONTRACTOR: SOILTESTING, INC. — LOGGED BY: TG
EQUIPMENT: BACKHOE — CHECKED BY: JS



SECTION FACING WEST

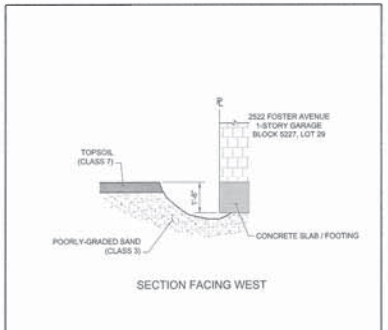
NOTES: BACKFILLED ON COMPLETION

GTA ENGINEERING SERVICES OF NEW YORK, P.C.
211-K GATES ROAD
LITTLE FERRY, NEW JERSEY 07643
TEL: (201) 641-1650

Sheet 1of 3

LOG OF TEST PIT NO. TP-2

PROJECT: 1353-1357 FLATBUSH AVENUE — PROJECT NO.: 34161921
PROJECT LOCATION: BROOKLYN, NEW YORK
CLIENT: HELLO LIVING
DATE STARTED: 10/20/2015 — GROUNDWATER ENCOUNTERED: NE
DATE COMPLETED: 10/20/2015 — GROUND SURFACE ELEVATION: 28.5± — DATUM: NAVD 88
CONTRACTOR: SOILTESTING, INC. — LOGGED BY: TG
EQUIPMENT: BACKHOE — CHECKED BY: JS



SECTION FACING WEST

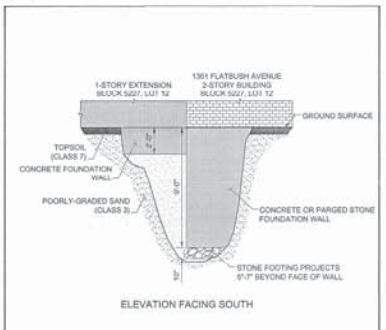
NOTES: BACKFILLED ON COMPLETION

GTA ENGINEERING SERVICES OF NEW YORK, P.C.
211-K GATES ROAD
LITTLE FERRY, NEW JERSEY 07643
TEL: (201) 641-1650

Sheet 2of 3

LOG OF TEST PIT NO. TP-3

PROJECT: 1353-1357 FLATBUSH AVENUE — PROJECT NO.: 34161921
PROJECT LOCATION: BROOKLYN, NEW YORK
CLIENT: HELLO LIVING
DATE STARTED: 10/20/2015 — GROUNDWATER ENCOUNTERED: NE
DATE COMPLETED: 10/20/2015 — GROUND SURFACE ELEVATION: 27.5± — DATUM: NAVD 88
CONTRACTOR: SOILTESTING, INC. — LOGGED BY: TG
EQUIPMENT: BACKHOE — CHECKED BY: JS



ELEVATION FACING SOUTH

NOTES: BACKFILLED ON COMPLETION

GTA ENGINEERING SERVICES OF NEW YORK, P.C.
211-K GATES ROAD
LITTLE FERRY, NEW JERSEY 07643
TEL: (201) 641-1650

Sheet 3of 3

LIST OF SOE DRAWINGS

SOE-001.	TITLE PAGE, TEST PIT KEY PLAN, NOTES
SOE-002.	EXCAVATION PLAN
SOE-003.	SECTIONS - PHASE 1
SOE-004.	SECTIONS - PHASE 2
SOE-005.	OSHA NOTES
SOE-006.	OSHA NOTES

SEQUENCE OF EXCAVATION:

A. PERFORM EXCAVATION PHASE 1 AS INDICATED ON PLANS

B. PERFORM PHASE 1 FOOTING AND FOUNDATION AS INDICATED ON PLANS.

C. PERFORM EXCAVATION & SHORING AS INDICATED ON PLANS.

SOLDIER PILE SCHEDULE		
SIZE	LENGTH	NUMBER
HP10x54	35'-0"	1-41

NOTE:
ALL LAGGING, CLEATS AND BRACING SHALL BE PRESSURE TREATED LUMBER, SIZED AS SHOWN FOR DEPTHS GREATER THAN 5 FT AND LESS THAN 12 FEET.

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SEAL

Accepted For OPPN #1/04
Professional Certification
BROOKLYN
Date: DEC 2 8 2015

ALEXANDER L. HIRSCH
AIA ASSOCIATE
DESIGN & ZONING CONSULTANT

BDP
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permits@bdpexpeditors.com

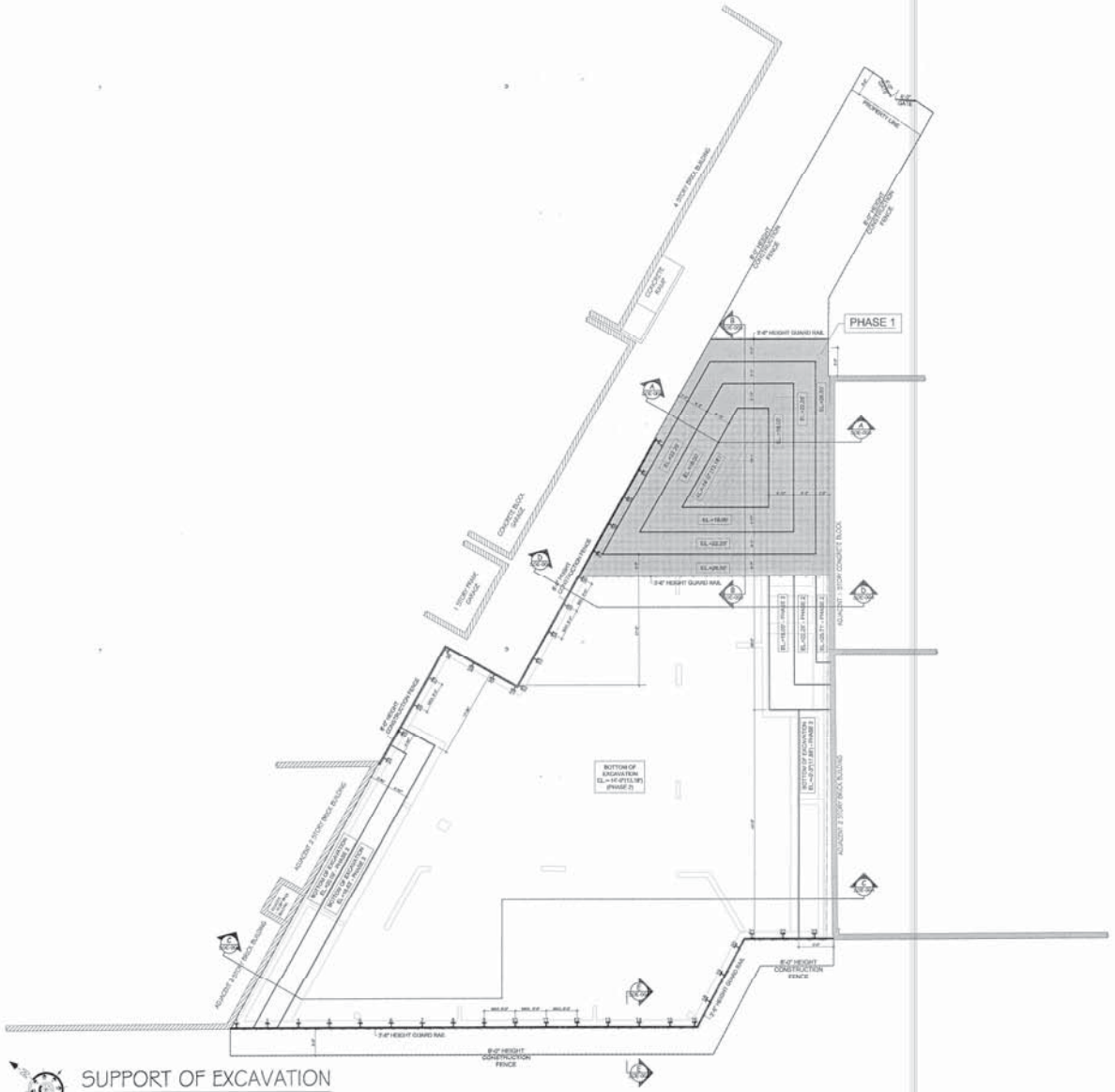
PROJECT ADDRESS:
1353
FLATBUSH AVENUE
BROOKLYN, NY

KEY PLANS
SECTIONS
NOTES

DRG No.
SOE-001.00

ARCHITECT/ENGENEER SHALL NOT HAVE CONTROL, CHARGE OF AND NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, DEVIATIONS, TECHNIQUES, SEQUENCES, PROCEDURES, SAFETY PRECAUTIONS AND/OR PROGRAMS IN CONNECTION WITH THE WORK, ACTS, OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS OR ANY OTHER PERSON PERFORMING ANY OF THE WORK, AND/OR FOR FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO HIRE PRIOR TO COMMENCEMENT OF ANY WORK AN INDEPENDENT ARCHITECT/ENGINEER TO PERFORM CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE NYC BUILDING CODE. THE ARCHITECT / ENGINEER PERFORMING THE CONTROL INSPECTIONS SHALL INSPECT THE SITE TO INSURE THE SAFETY OF THE SITE, QUALITY OF WORK, COMPLIANCE TO NYC BUILDING CODE, ZONING RESOLUTION, AND / OR ANY APPLICABLE CODE IN ACCORDANCE WITH CONTRACT DOCUMENTS. THE ARCHITECT/ENGINEER, PERFORMING CONTROL INSPECTIONS SHALL SUBMIT THE CONTROL INSPECTIONS, PROGRESS REPORT AND ALL FINDINGS OF THE WORKSITE TO THE DEPARTMENT OF BUILDINGS.

THE IMPLEMENTATION OF THESE DRAWINGS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BRING TO ARCHITECT'S ATTENTION IN WRITING ANY DISCREPANCIES IN THESE PLANS. THE CONTRACTOR SHALL SUBMIT TO ARCHITECT FOR APPROVAL ALL SHOP DRAWINGS AND SPECIFICATIONS RELATED TO THIS PROJECT.



SUPPORT OF EXCAVATION

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

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Date: DEC 23 2015

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SUPPORT OF EXCAVATION

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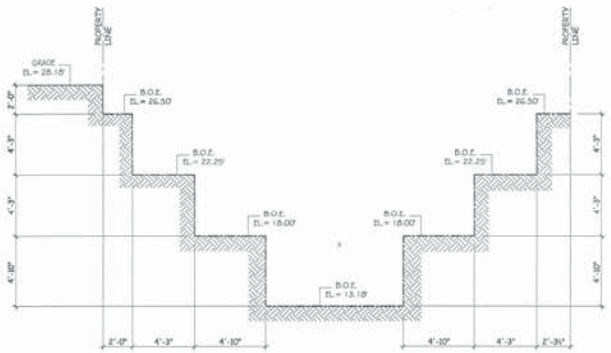

SECTION A-A (PHASE 1)

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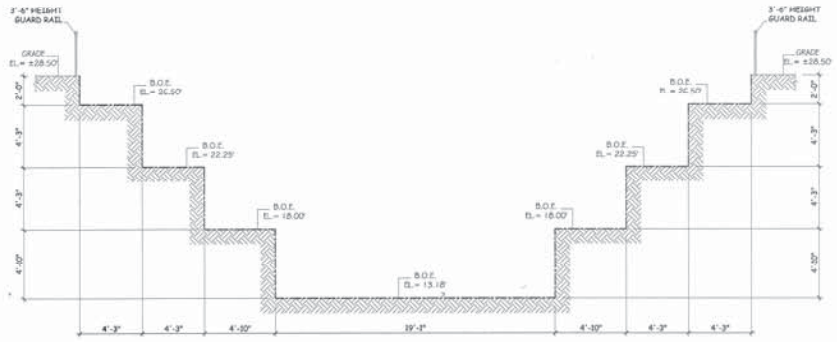

SECTION B-B (PHASE 1)

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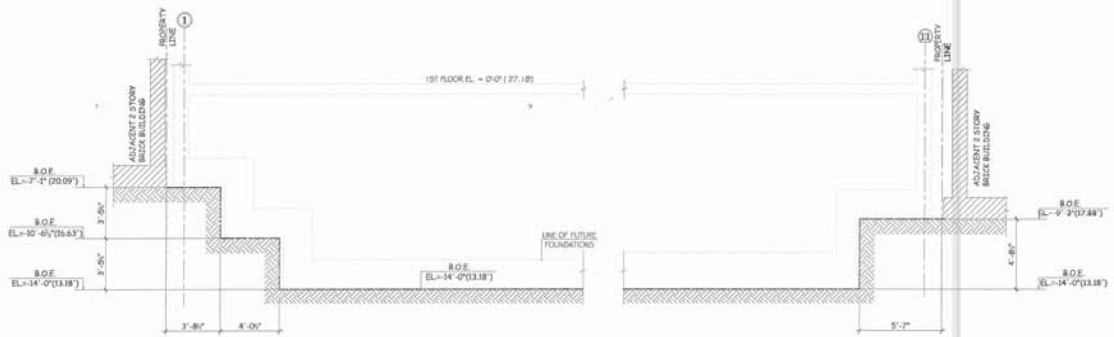

SECTION C-C (PHASE 2)

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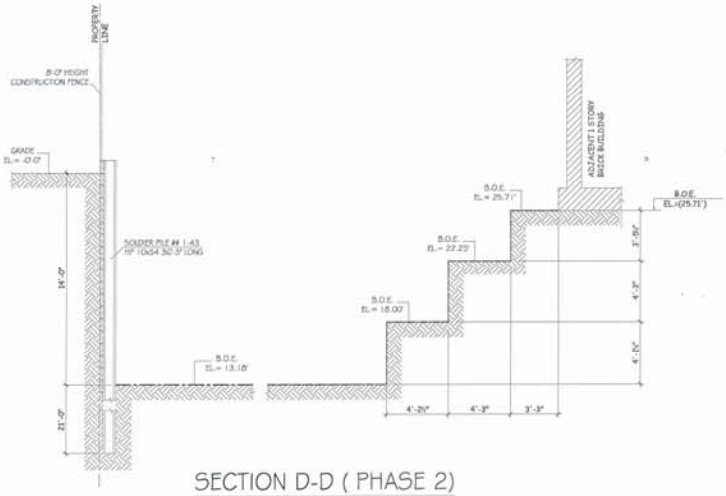

SECTION D-D (PHASE 2)

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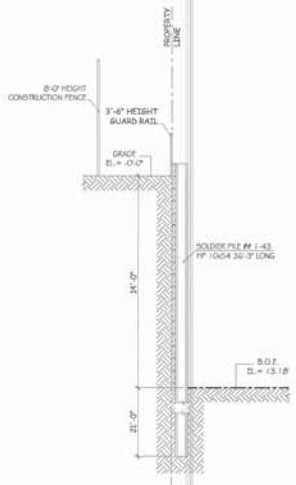

SECTION E-E (PHASE 2)

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

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OSHA Safety and Health Regulations for Excavations Sites.

1926.650 Scope, application, and definihing appliacble to this part.

1926.650(a) Scope and apllication. This subpart applies to all open excavation made in the earth's surface. Excavations are defined to include trenches.

1926.650(b) Definitions applicable to this subpart.

"Accepted engineering practices" means those requirements which are compatible with standards of practice required by a registered professional engineer.

"Aluminum Hydraulic Shoring" means a pre-engineered shoring system comprised of aluminum hydraulic cylinders (crossbraces) used in conjunction with vertical rails (uprights) or horizontal rails (wales). Such system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.

"Bell-bottom pier hole" means a type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.

"Benching (Benching system)" means a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontallevels or steps, usually with vertical or near-vertical surfaces between levels.

"Cave-in" means the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or other wise injure and immobilize a person.

"Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

"Cross braces" mean the horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

"Excavation" means any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

"Faces" or "sides" means the vertical or inclined earth surfaces formed as a result of excavation work.

"Failure" means the breakage, displacement, or permanent deformation of a structural member `or connection so as to reduce its structural integrity and its supportive capabilities.

"Hazardous atmosphere" means an atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

"Kickout" means the accidental release or failure of a cross brace.

"Protective system" means a method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

"Ramp" means an inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.

"Registered Professional Engineer" means a person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

"Sheeting" means the members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

"Shield (Shield system)" means a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either premanufactured or job-built in accordance with 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

"Shoring (Shoring system)" means a structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

"Sides". See "Faces."

"Sloping (Sloping system)" means a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

"Stable rock" means natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

"Structural ramp" means a ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.

"Support system" means a structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

"Tabulated data" means tables and charts approved by a registered professional engineer and used to design and construct a protective system.

"Trench (Trench excavation)" means a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

"Trench box." See "Shield.

"Trench shield." See "Shield."

"Uprights" means the vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

"Wales" means horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

1926.651 Specific excavation requirements.

1926.651(a) Surface encumbrances. All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.

1926.651(b) Underground installations.

1926.651(b)(1) The estimated location of utility installations, such as sewer, telephone, fuel,electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavationwork, shall be determined prior to opening an excavation.

1926.651(b)(2) Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations,the employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.

1926.651(b)(3) When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.

1926.651(b)(4) While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.

1926.651(c) Access and egress -

1926.651(c)(1) Structural ramps.

1926.651(c)(1)(i) Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified instructural design, and shall be constructed in accordance with the design.

1926.651(c)(1)(ii) Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.

1926.651(c)(1)(iii) Structural members used for ramps and runways shall be of uniform thickness.

1926.651(c)(1)(iv) Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.

1926.651(c)(1)(v) Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments o the top surface to prevent slipping.

1926.651(c)(2) Means of egress from trench excavations. A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.

1926.651(d) Exposure to vehicular traffic. Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

1926.651(e) Exposure to falling loads. No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with 1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.

1926.651(f) Warning system for mobile equipment. When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

1926.651(g) Hazardous atmospheres -

1926.651(g)(1) Testing and controls. In addition to the requirements set forth in subparts D and E of this part (29 CFR 1926.50 - 1926.107) to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:

1926.651(g)(1)(i) Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.

1926.651(g)(1)(ii) Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation in accordance with subparts D and E of this part respectively.

1926.651(g)(1)(iii) Adequate precaution shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a lammable gas in excess of 20 percent of the lower flammable limit of the gas.

1926.651(g)(1)(iv) When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

1926.651(g)(2) Emergency rescue equipment.

1926.651(g)(2)(i) Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.

1926.651(g)(2)(ii) Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

1926.651(h) Protection from hazards associated with water accumulation.

1926.651(h)(1) Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety harness and lifeline.

1926.651(h)(2) If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.

1926.651(h)(3) If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person and compliance with paragraphs (h)(1) and (h)(2) of this section.

1926.651(i) Stability of adjacent structures.

1926.651(i)(1) Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.**1926.651(i)(2)** Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:

1926.651(i)(2)(i) A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or

1926.651(i)(2)(ii) The excavation is in stable rock; or

1926.651(i)(2)(iii) A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or

1926.651(i)(2)(iv) A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

1926.651(i)(3) Sidewalks, pavements and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

1926.651(j) Protection of employees from loose rock or soil.

1926.651(j)(1) Adequate protection shall be provided to protect employees from loose rock or `soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide quivalent protection.

1926.651(j)(2) Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

1926.651(k) Inspections.

1926.651(k)(1) Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

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1926.651(k)(2) Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

1926.651(l) Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails which comply with 1926.502(b) shall be provided where walkways are 6 feet (1.8 m) or more above lower levels.[59 FR 40730, Aug 9, 1994]

1926.652 Requirements for protective systems.

1926.652(a) Protection of employees in excavations.

1926.652(a)(1) Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with paragraph (b) or (c) of this section except when:

1926.652(a)(1)(i) Excavations are made entirely in stable rock; or

1926.652(a)(1)(ii) Excavations are less than 5 feet (1.52 m) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

1926.652(a)(2) Protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be appliedor transmitted to the system.

1926.652(b) Design of sloping and benching systems. The slopes and configurations of sloping and benching systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (b)(1); or, in the alternative, paragraph (b)(2); or, in the alternative, paragraph (b)(3); or, in the alternative,paragraph (b)(4), as follows:

1926.652(b)(1) Option (1) - Allowable configurations and slopes.

1926.652(b)(1)(i) Excavations shall be sloped at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal), unless the employer uses one of the other options listed below.

1926.652(b)(1)(ii) Slopes specified in paragraph (b)(1)(i) of this section, shall be excavated to form configurations that are in accordance with the slopes shown for Type C soil in Appendix B to this subpart.

1926.652(b)(2) Option (2) - Determination of slopes and configurations using Appendices A and B. Maximum allowable slopes, and allowable configurations for sloping and benching systems, shall be determined in accordance with the conditions and requirements set forth in appendices A and B to this subpart.

1926.652(b)(3) Option (3) - Designs using other tabulated data.

1926.652(b)(3)(i) Designs of sloping or benching systems shall be selected from and in accordance with tabulated data, such as tables and charts.

1926.652(b)(3)(ii) The tabulated data shall be in written form and shall include all of the following:

1926.652(b)(3)(ii)(A) Identification of the parameters that affect the selection of a sloping or benching system drawn from such data;

1926.652(b)(3)(ii)(B) Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe;

1926.652(b)(3)(ii)(C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

1926.652(b)(3)(iii) At least one copy of the tabulated data which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.

1926.652(b)(4) Option (4) - Design by a registered professional engineer.

1926.652(b)(4)(i) Sloping and benching systems not utilizing Option (1) or Option (2) or Option (3) under paragraph (b) of this section shall be approved by a registered professional engineer.

1926.652(b)(4)(ii) Designs shall be in written form and shall include at least the following:

1926.652(b)(4)(ii)(A) The magnitude of the slopes that were determined to be safe for the particular project;

1926.652(b)(4)(ii)(B) The configurations that were determined to be safe for the particular project;

1926.652(b)(4)(ii)(C) The identity of the registered professional engineer approving the design.

1926.652(b)(4)(iii) At least one copy of the design shall be maintained at the jobsite while the slope is being constructed. After that time the design need not be at the jobsite, but a copy shall be made available to the Secretary upon request.

1926.652(c) Design of support systems, shield systems, and other protective systems. Designs of support systems, shield systems, and other protective systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (c)(1); or, in the alternative, paragraph (c)(2); or, in the alternative, paragraph (c)(3); or, i the alternative, paragraph (c)(4) as follows:

1926.652(c)(1) Option (1) - Designs using appendices A, C and D. Designs for timber shoring in trenches shall be determined in accordance with the conditions and requirements set forth in appendices A and C to this subpart. Designs for aluminum hydraulic shoring shall be in accordance with paragraph (c)(2) of this section, but if manufacturer's tabulated data cannot be utilized, designs shall be in accordance with appendix D.

1926.652(c)(2) Option (2) - Designs Using Manufacturer's Tabulated Data.

1926.652(c)(2)(i) Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data shall be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

1926.652(c)(2)(ii) Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer shall only be allowed after the manufacturer issues specific written approval.

1926.652(c)(2)(iii) Manufacturer's specifications, recommendations, and limitations, and manufacturer's approval to deviate from the specifications,recommendations, and limitations shall be in written form at the jobsite during construction of the protective system. After that time this data may be stored off the jobsite, but a copy shall be made available to the Secretary upon request.

1926.652(c)(3) Option (3) - Designs using other tabulated data.

1926.652(c)(3)(i) Designs of support systems, shield systems,or other protective systems shall be selected from and be in accordance with tabulated data, such as tables and charts.

1926.652(c)(3)(ii) The tabulated data shall be in written form and include all of the following:

1926.652(c)(3)(ii)(A) Identification of the parameters that affect the selection of a protective system drawn from such data;

1926.652(c)(3)(ii)(B) Identification of the limits of use of the data;

1926.652(c)(3)(ii)(C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

1926.652(c)(3)(iii) At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.

1926.652(c)(4) Option (4) - Design by a registered professional engineer.

1926.652(c)(4)(i) Support systems, shield systems, and other protective systems not utilizing Option 1, Option 2 or Option 3, above, shall be approved by a registered professional engineer.

1926.652(c)(4)(ii) Designs shall be in written form and shall include the following:

1926.652(c)(4)(ii)(A) A plan indicating the sizes, types, and configurations of the materials to be used in the protective system; and

1926.652(c)(4)(ii)(B) The identify of the registered professional engineer approving the design.

1926.652(c)(4)(iii) At least one copy of the design shall be maintained at the jobsite during construction of the protective system. After that time, the design may be stored off the jobsite, but a copy of the design shall be made available to the Secretary upon request.

1926.652(d) Materials and equipment.

1926.652(d)(1) Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function.

1926.652(d)(2) Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.

1926.652(d)(3) When material or equipment that is used for protective systems is damaged, a competent person shall examine the material or equipment and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service, and shall be evaluated and approved by a registered professional engineer before being returned to service.

1926.652(e) Installation and removal of support -

1926.652(e)(1) General.

1926.652(e)(1)(i) Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure. ,

1926.652(e)(1)(ii) Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

1926.652(e)(1)(iii) Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.

1926.652(e)(1)(iv) Before temporary removal of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.

1926.652(e)(1)(v) Removal shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.

1926.652(e)(1)(vi) Backfilling shall progress together with the removal of support systems from excavations.

1926.652(e)(2) Additional requirements for support systems for trench excavations.

1926.652(e)(2)(i) Excavation of material to a level no greater than 2 feet (.61 m) below the bottom of the members of a support system shall be permitted, but only if the system is designed to resist the forces calculated for the full limitations, and manufacturer's approval to deviate from the specifications,recommendations, and limitations shall be in written form at the jobsite during construction of the Protective system. After that time this data may be stored off the jobsite, but a copy shall be made available to the Secretary upon request.

1926.652(c)(3) Option (3) - Designs using other tabulated data.

1926.652(c)(3)(i) Designs of support systems, shield systems, or other protective systems shall be selected from and be in accordance with tabulated data,such as tables and charts.

1926.652(c)(3)(ii) The tabulated data shall be in written form and include all of the following:

1926.652(c)(3)(ii)(A) Identification of the parameters that affect the selection of a protective system drawn from such data;

1926.652(c)(3)(ii)(B) Identification of the limits of use of the data;

1926.652(c)(3)(ii)(C) Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

1926.652(c)(3)(iii) At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.

1926.652(c)(4) Option (4) - Design by a registered professional engineer.

1926.652(c)(4)(i) Support systems, shield systems, and other protective systems not utilizing Option 1, Option 2 or Option 3, above, shall be approved by a registered professional engineer.

1926.652(c)(4)(ii) Designs shall be in written form and shall include the following:

1926.652(c)(4)(ii)(A) A plan indicating the sizes, types, and configurations of the materials to be used in the protective system; and

1926.652(c)(4)(ii)(B) The identify of the registered professional engineer approving the design.

1926.652(c)(4)(iii) At least one copy of the design shall be maintained at the jobsite during construction of the protective system. After that time, the design may be stored off the jobsite, but a copy of the design shall be made available to the Secretary upon request.

1926.652(d) Materials and equipment.

1926.652(d)(1) Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function.

1926.652(d)(2) Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.

1926.652(d)(3) When material or equipment that is used for protective systems is damaged, a competent person shall examine the material or equipment and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service, and shall be evaluated and approved by a registered professional engineer before being returned to service.

1926.652(e) Installation and removal of support -

1926.652(e)(1) General.

1926.652(e)(1)(i) Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.

1926.652(e)(1)(ii) Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

1926.652(e)(1)(iii) Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.

1926.652(e)(1)(iv) Before temporary removal of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.

1926.652(e)(1)(v) Removal shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.

1926.652(e)(1)(vi) Backfilling shall progress together with the removal of support systems from excavations.

1926.652(e)(2) Additional requirements for support systems for trench excavations.

1926.652(e)(2)(i) Excavation of material to a level no greater than 2 feet (.61 m) below the bottom of the members of a support system shall be permitted,but only if the system is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

1926.652(e)(2)(ii) Installation of a support system shall be closely coordinated with the excavation of trenches.

1926.652(f) Sloping and benching systems. Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling,or sliding material or equipment.

1926.652(g) Shield systems -

1926.652(g)(1) General.

1926.652(g)(1)(i) Shield systems shall not be subjected to loads exceeding those which the system was designed to withstand.

1926.652(g)(1)(ii) Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.

1926.652(g)(1)(iii) Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.

1926.652(g)(1)(iv) Employees shall not be allowed in shields when shields are being installed, removed, or moved vertically.

1926.652(g)(2) Additional requirement for shield systems used in trench excavations. Excavations of earth material to a level not greater than 2 feet (.61 m) below the bottom of a shield shall be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield.

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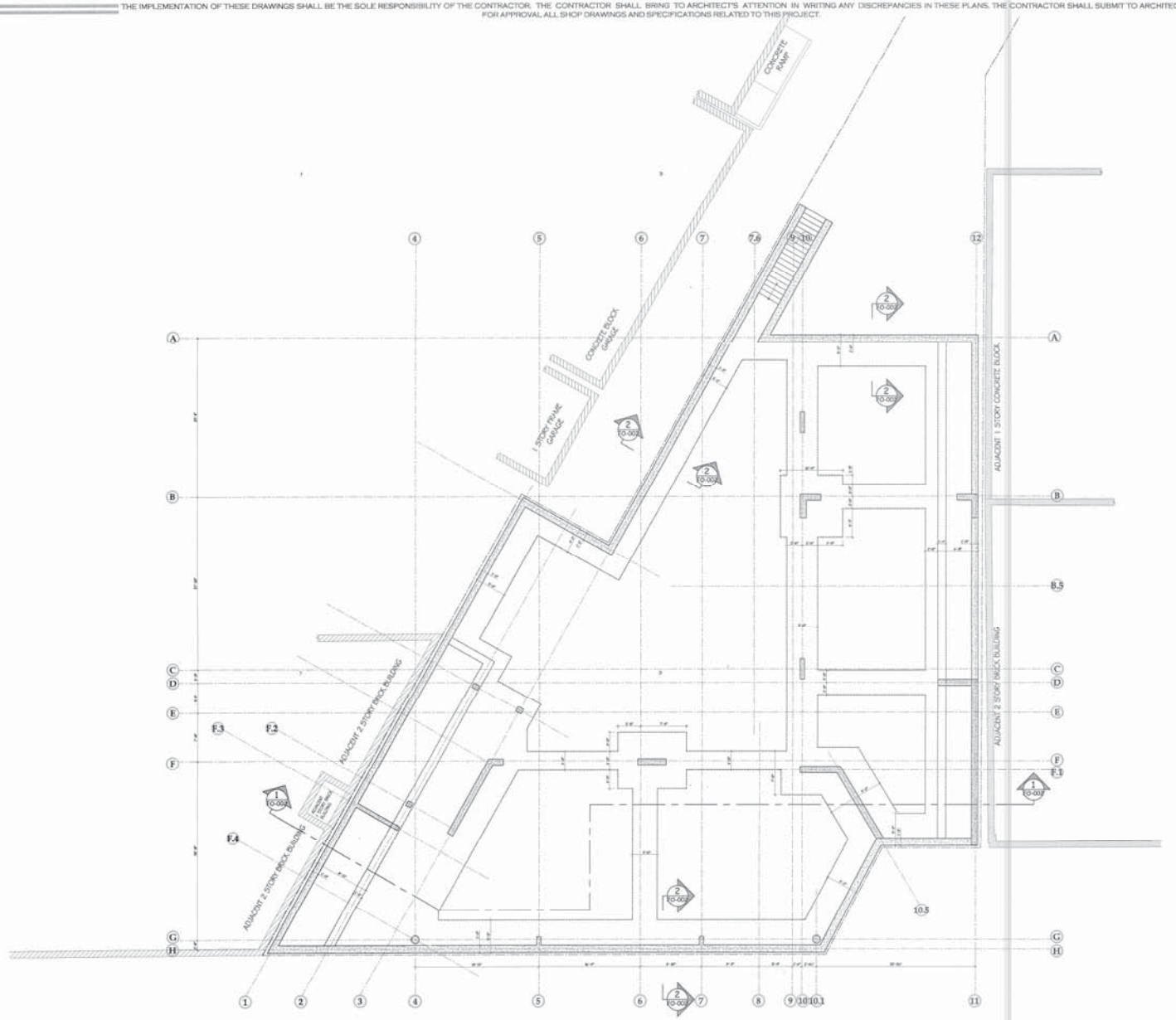
OSHA Safety and Health Regulations For Excavation Notes

DWG No
SOE-006.00

ARCHITECT/ENGENEER SHALL NOT HAVE CONTROL, CHARGE OF AND NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, DEVIATIONS, TECHNIQUES, SEQUENCES, PROCEDURES, SAFETY PRECAUTIONS AND/OR PROGRAMS IN CONNECTION WITH THE WORK, ACTS, OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS OR ANY OTHER PERSON PERFORMING ANY OF THE WORK, AND/OR FOR FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO HIRE PRIOR TO COMMENCEMENT OF ANY WORK AN INDEPENDENT ARCHITECT/ ENGINEER TO PERFORM CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE NYC BUILDING CODE. THE ARCHITECT / ENGINEER PERFORMING THE CONTROL INSPECTIONS SHALL INSPECT THE SITE TO INSURE THE SAFETY OF THE SITE, QUALITY OF WORK, COMPLIANCE TO NYC BUILDING CODE, ZONING RESOLUTION, AND / OR ANY APPLICABLE CODE IN ACCORDANCE WITH CONTRACT DOCUMENTS. THE ARCHITECT/ENGINEER, PERFORMING CONTROL INSPECTIONS SHALL SUBMIT THE CONTROL INSPECTIONS, PROGRESS REPORT AND ALL FINDINGS OF THE WORKSITE TO THE DEPARTMENT OF BUILDINGS.

THE IMPLEMENTATION OF THESE DRAWINGS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BRING TO ARCHITECT'S ATTENTION IN WRITING ANY DISCREPANCIES IN THESE PLANS. THE CONTRACTOR SHALL SUBMIT TO ARCHITECT FOR APPROVAL ALL SHOP DRAWINGS AND SPECIFICATIONS RELATED TO THIS PROJECT.



FOUNDATION PLAN

SCALE: $\frac{1}{8}$"=1'-0"

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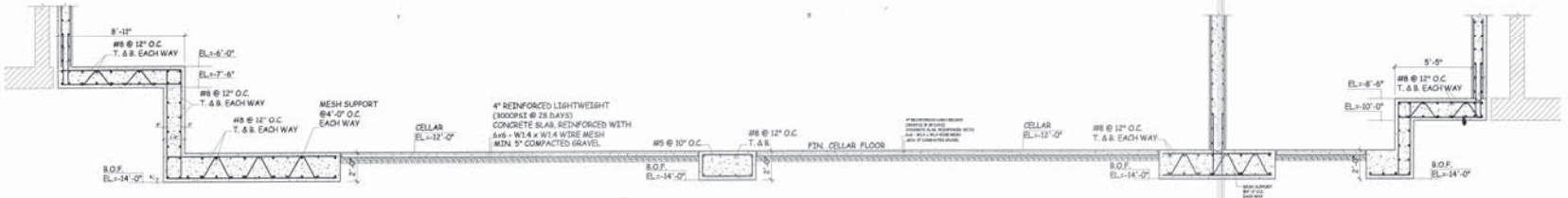

1-1 / FO-001 FOUNDATION SECTION
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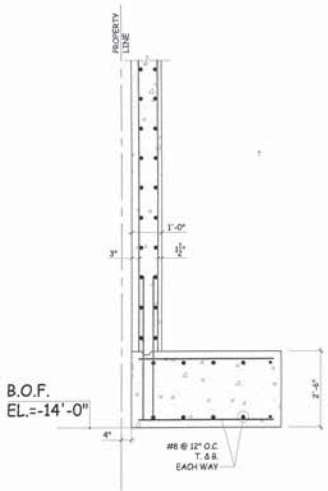

2-2 / FO-001 FOUNDATION SECTION
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FOUNDATION SECTIONS

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FO-002.00

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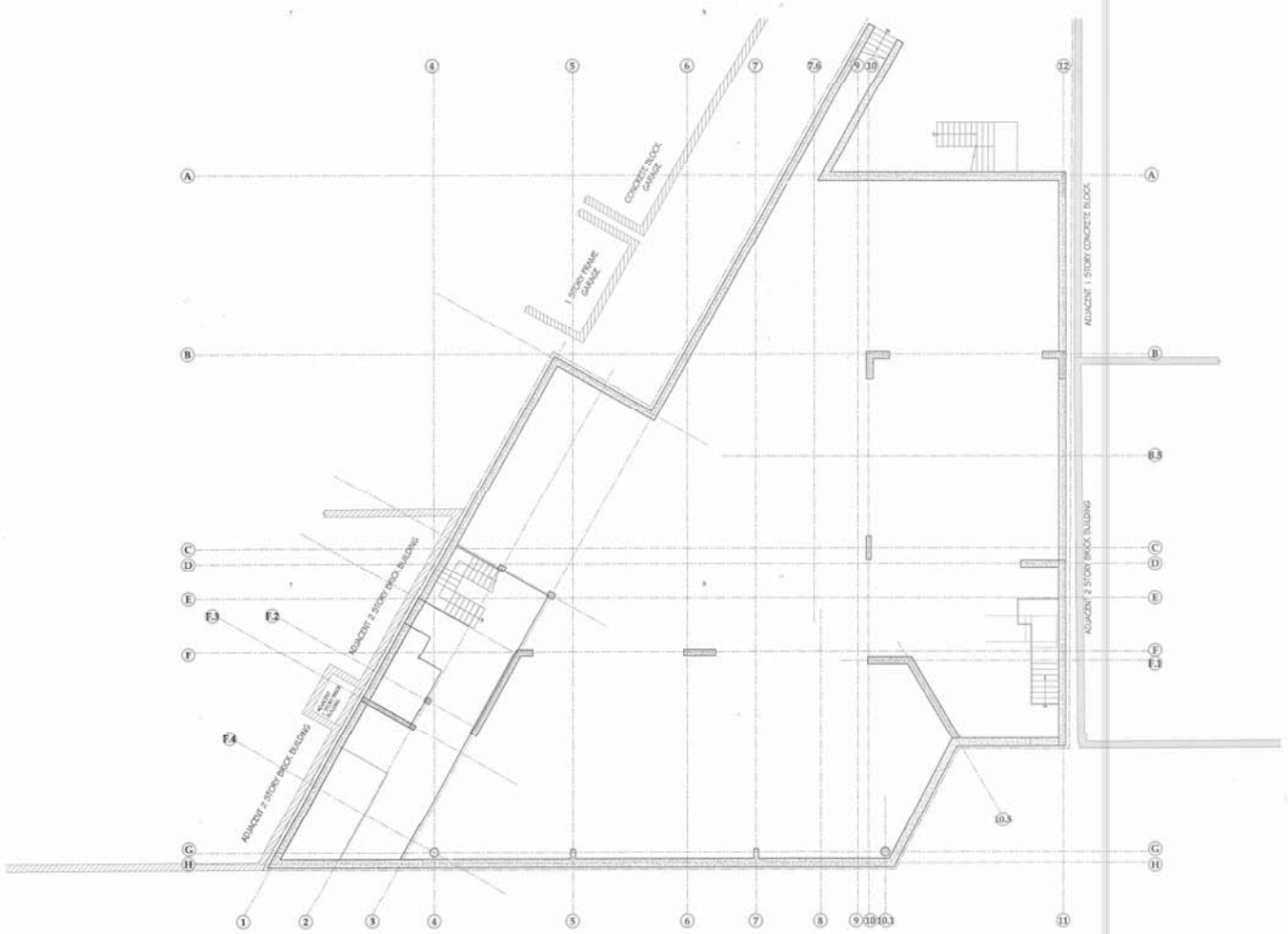

1ST FLOOR FRAMING PLAN

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

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1ST FLOOR
FLOOR PLAN

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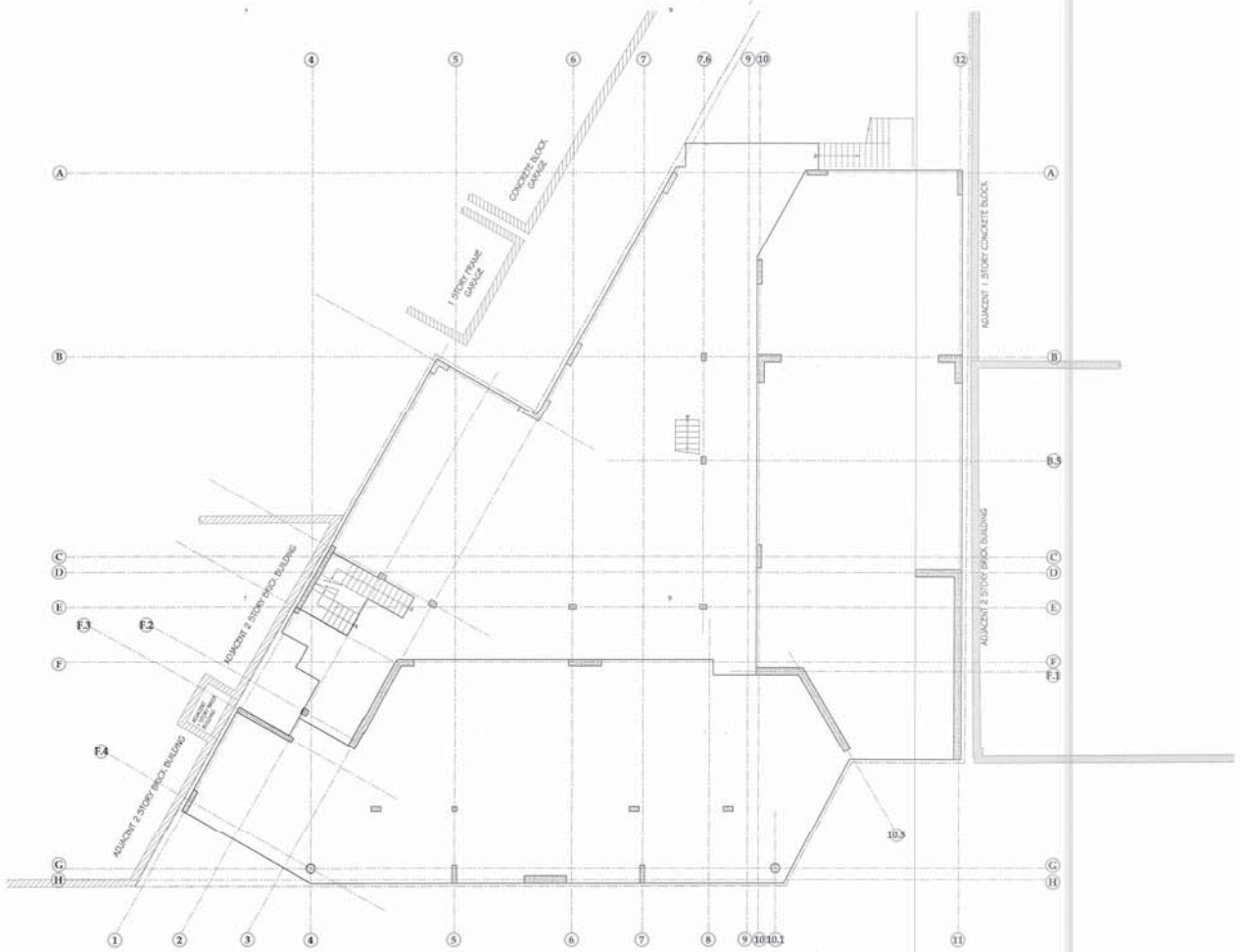

2ND FLOOR FRAMING PLAN

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

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2ND
FLOOR PLAN

DWG No
S-002.00

DOB# 310333671
Scan Code 1354533478221

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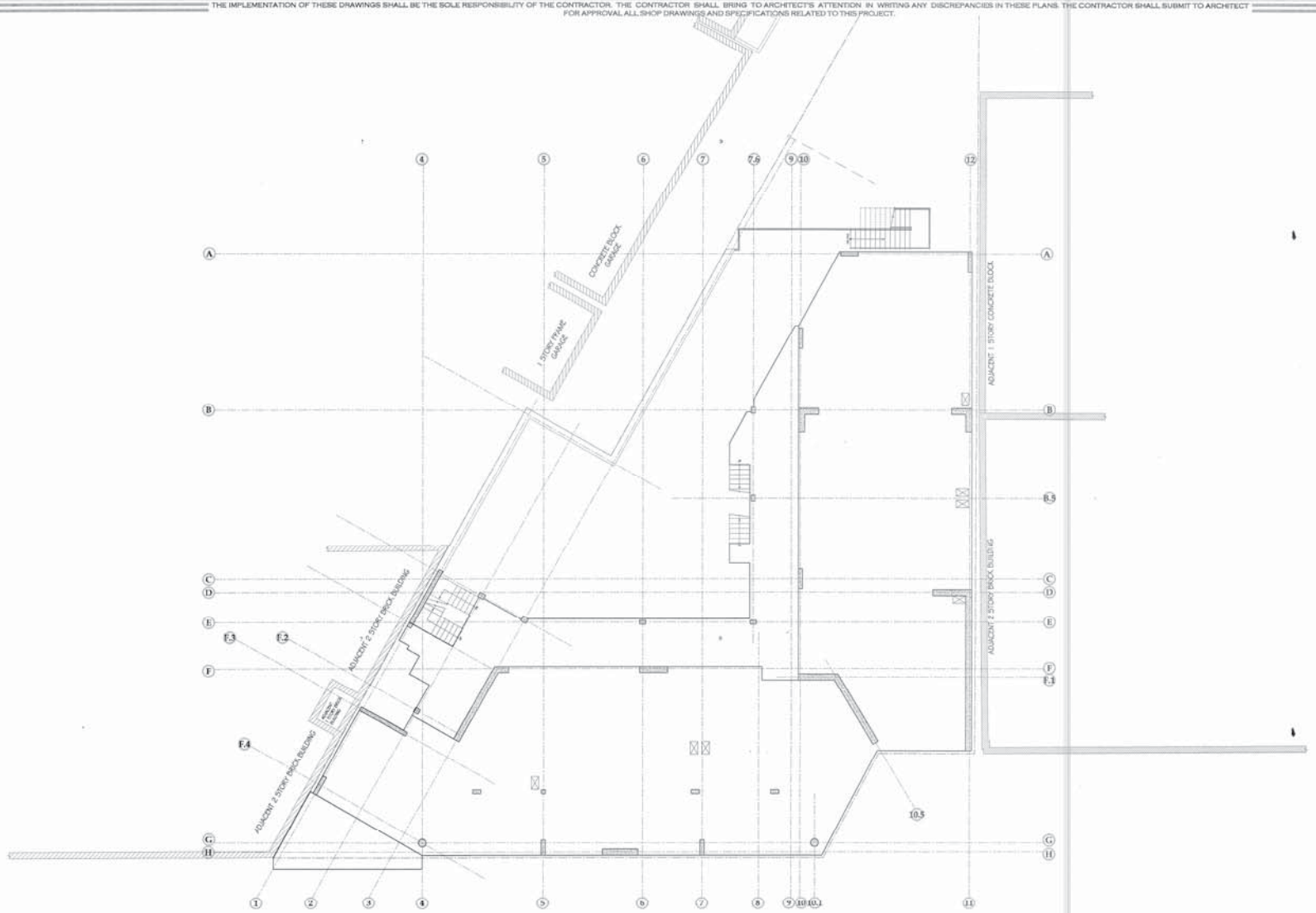

3RD FLOOR FRAMING PLAN

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

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3RD
FLOOR PLAN

DWG No
S-003.00

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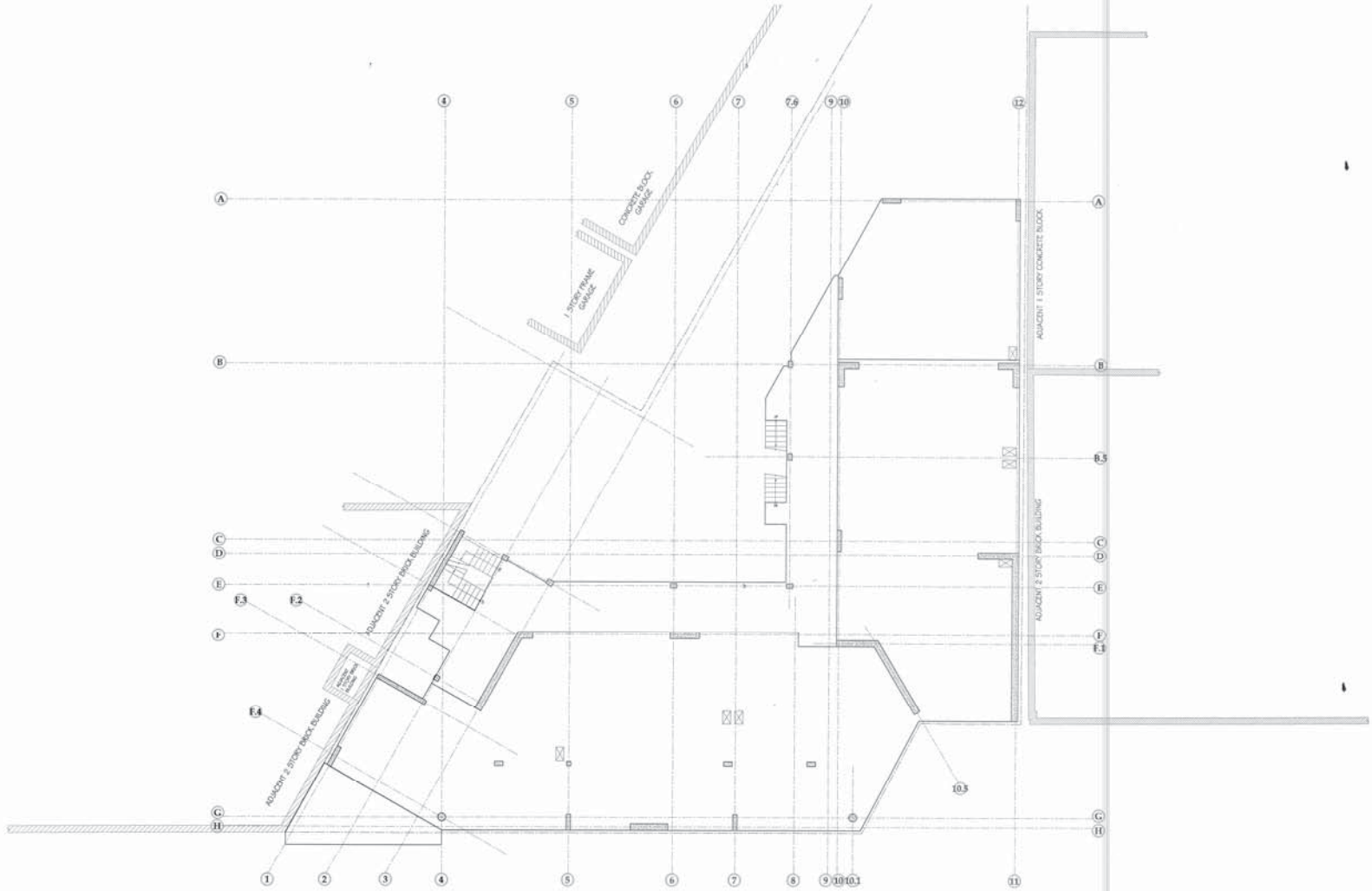

4TH FLOOR FRAMING PLAN

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

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Leonid Segal, PE
e: leo@tecnicoengineering.com
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SEAL

Accepted For OPPN #1/04
Professional Certification
BROOKLYN
Date: DEC 23 2015

ALEXANDER L. HIRSCH
AIA ASSOCIATE
DESIGN & ZONING CONSULTANT

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PROJECT ADDRESS
1353
FLATBUSH AVENUE
BROOKLYN, NY

4TH
FLOOR PLAN

DWG No
S-004.00

PAGE:

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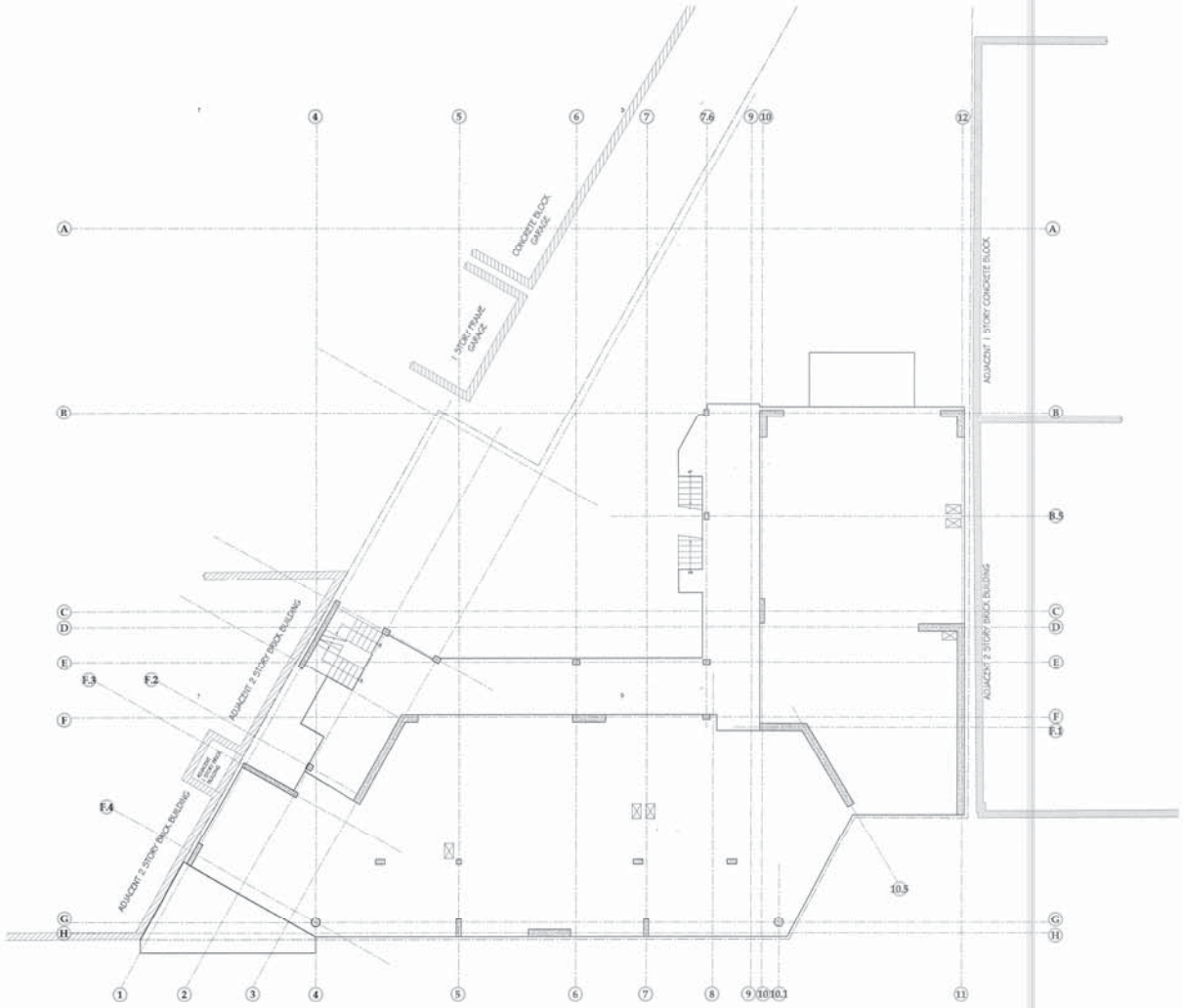
THE IMPLEMENTATION OF THESE DRAWINGS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BRING TO ARCHITECT'S ATTENTION IN WRITING ANY DISCREPANCIES IN THESE PLANS. THE CONTRACTOR SHALL SUBMIT TO ARCHITECT FOR APPROVAL ALL SHOP DRAWINGS AND SPECIFICATIONS RELATED TO THIS PROJECT.



5TH FLOOR FRAMING PLAN

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

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BROOKLYN
Date: DEC 2 3 2015

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PROJECT ADDRESS:
1353
FLATBUSH AVENUE
BROOKLYN, NY

5TH
FLOOR PLAN

DWG No
S-005.00

BDPP BLOCK Job No: 310131675
Issue Code: 33453616795

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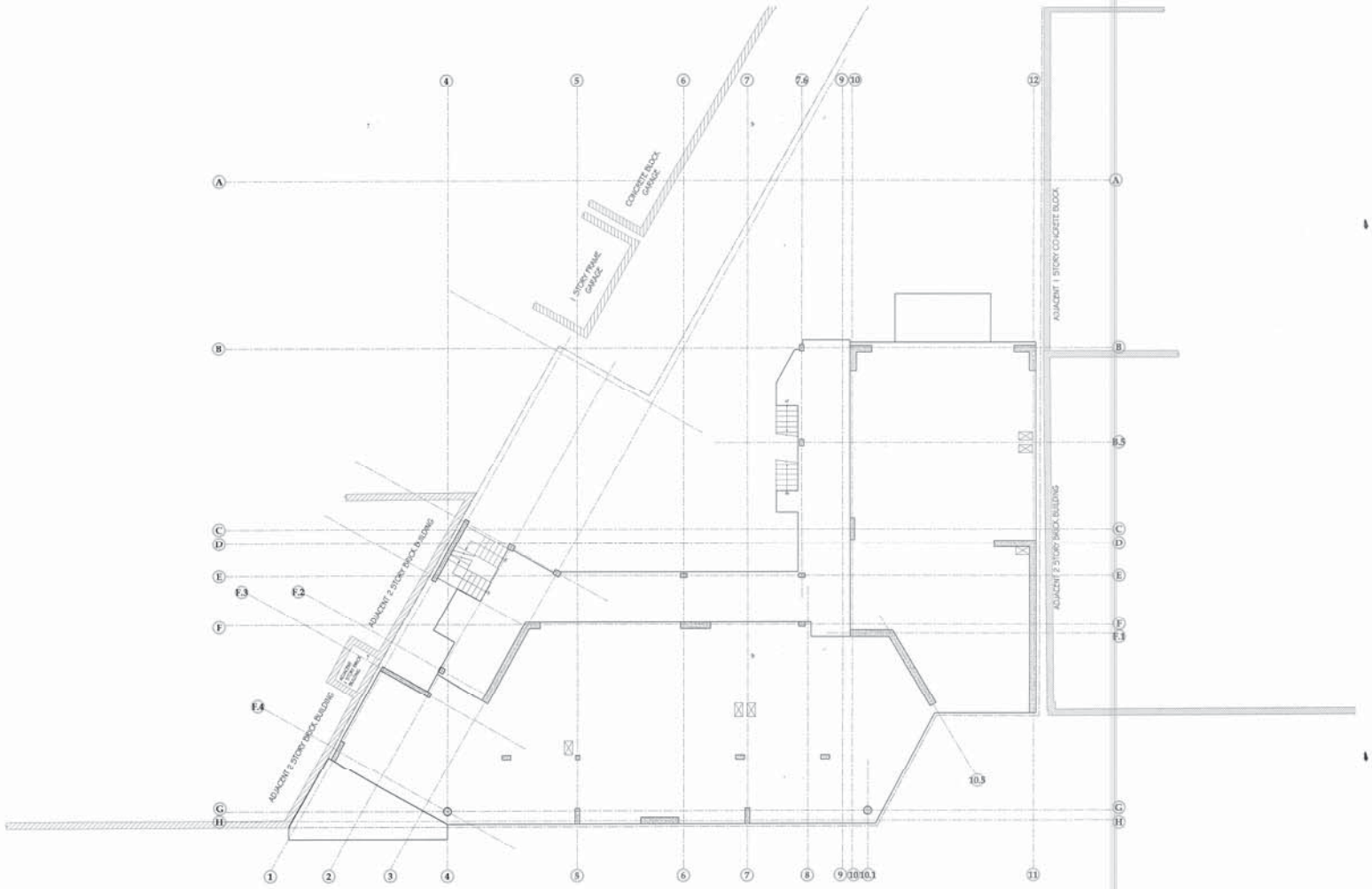

6TH FLOOR FRAMING PLAN

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

ARCHITECT/ENGENEER SHALL NOT HAVE CONTROL, CHARGE OF AND NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, DEVIATIONS, TECHNIQUES, SEQUENCES, PROCEDURES, SAFETY PRECAUTIONS AND/OR PROGRAMS IN CONNECTION WITH THE WORK, ACTS, OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS OR ANY OTHER PERSON PERFORMING ANY OF THE WORK, AND/OR FOR FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO HIRE PRIOR TO COMMENCEMENT OF ANY WORK AN INDEPENDENT ARCHITECT/ ENGINEER TO PERFORM CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE NYC BUILDING CODE. THE ARCHITECT / ENGINEER PERFORMING THE CONTROL INSPECTIONS SHALL INSPECT THE SITE TO INSURE THE SAFETY OF THE SITE, QUALITY OF WORK, COMPLIANCE TO NYC BUILDING CODE, ZONING RESOLUTION, AND / OR ANY APPLICABLE CODE IN ACCORDANCE WITH CONTRACT DOCUMENTS. THE ARCHITECT/ENGINEER, PERFORMING CONTROL INSPECTIONS SHALL SUBMIT THE CONTROL INSPECTIONS, PROGRESS REPORT AND ALL FINDINGS OF THE WORKSITE TO THE DEPARTMENT OF BUILDINGS.

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SEAL

Accepted Per OPPN #1/04
Professional Certification
BROOKLYN
DEC 23 2015
Date:

ALEXANDER L. HIRSCH
AIA ASSOCIATE
DESIGN & ZONING CONSULTANT

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PROJECT ADDRESS:
1353
FLATBUSH AVENUE
BROOKLYN, NY

5TH
FLOOR PLAN

DWG. No
S-006.00

DEPT. BLDGS Job No. 310151675
Exam. Code E0105206K0
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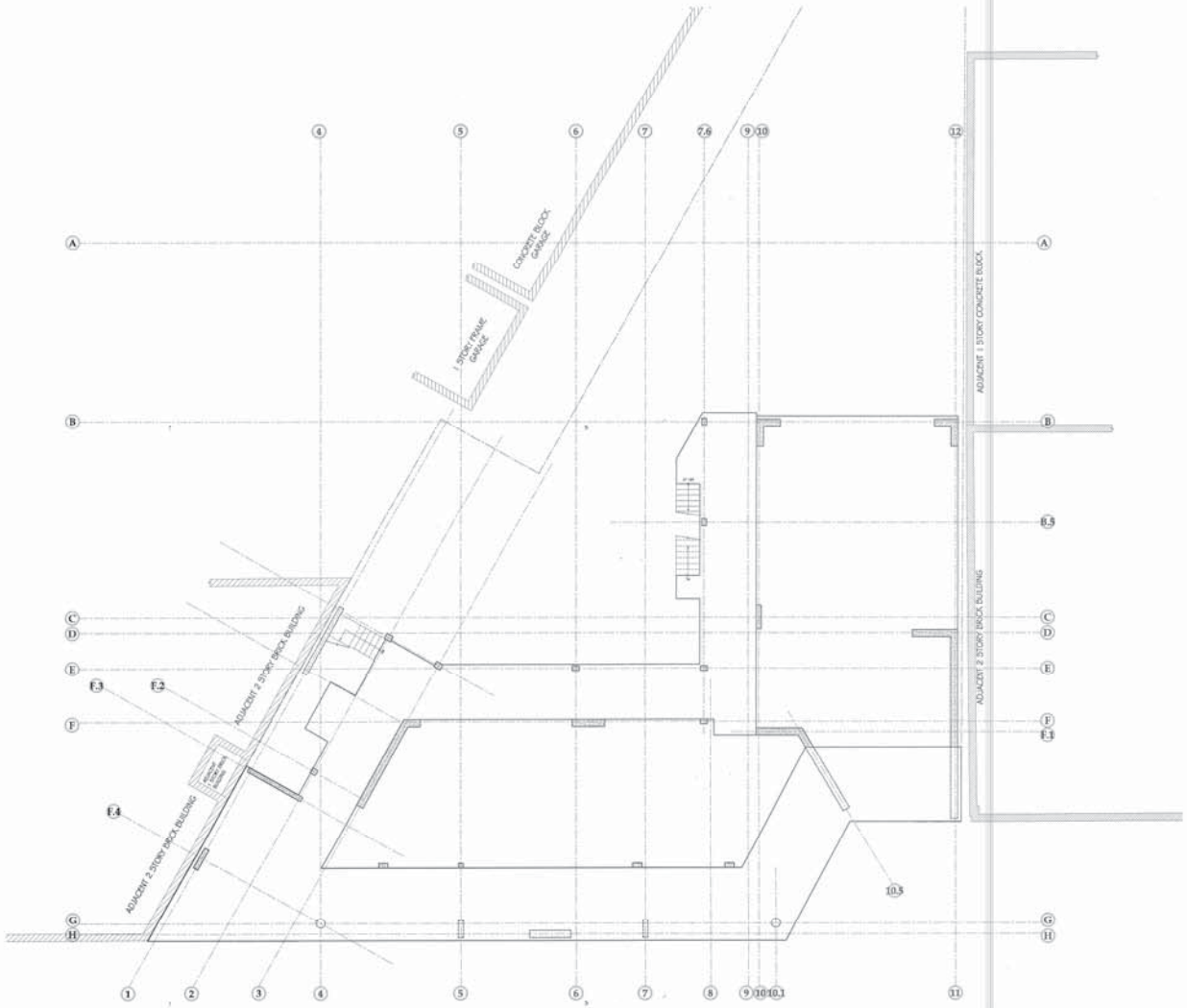

7TH FLOOR FRAMING PLAN

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

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DEC 23 105
Date:

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PROJECT ADDRESS:
1353
FLATBUSH AVENUE
BROOKLYN, NY

7TH
FLOOR PLAN

DWG No
S-007.00

DOB Blanket Job No 310133675
Scan Date 12/20/2005

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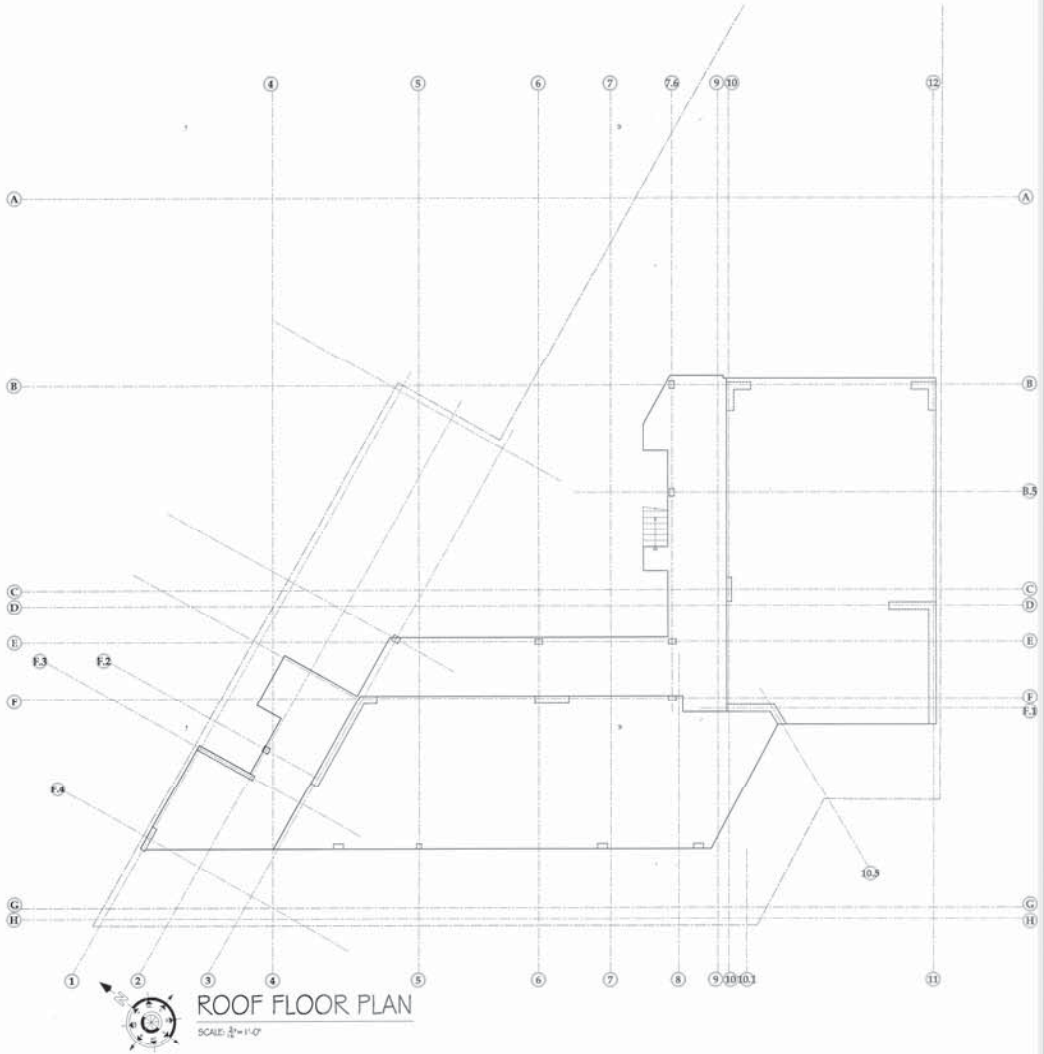

ROOF FLOOR PLAN

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

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SEAL

Accepted For OPPN #1404
Professional Certificati...
BROOKLYN
Date: DEC 2 3 2015

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DESIGN & ZONING CONSULTANT

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tel: 718.435.4060
www.bdpexpeditters.com
permits@bdpexpeditters.com

PROJECT ADDRESS:
1353
FLATBUSH AVENUE
BROOKLYN, NY

ROOF
FLOOR PLAN

DWG No
S-008.00

DOB# 302021675
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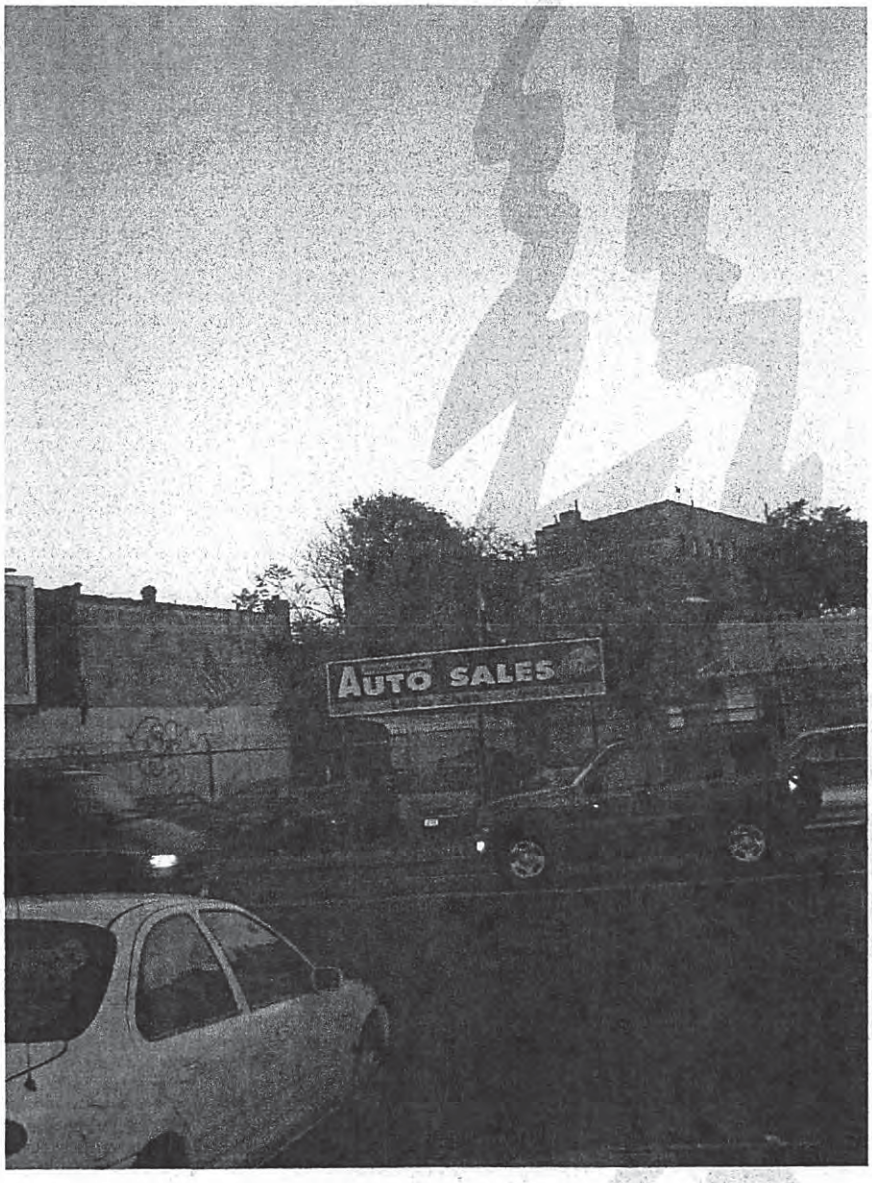
40 Wall Street, 11th Floor, New York, NY 10005 • Phone: (212) 747-1997 • Fax: (212) 747-1947 • http://www.haks.net

APPENDIX 2

HISTORICAL ENVIRONMENTAL REPORTS

SINGER
environmental group

PHASE I ENVIRONMENTAL ASSESSMENT



1353-1355 FLATBUSH AVENUE
BROOKLYN, NY 11210

5318 New Utrecht Avenue Brooklyn, New York 11219
T: 718.437.9600 F: 718.437.0082 E: singenv@aol.com

PHASE I ENVIRONMENTAL ASSESSMENT

ASTM E1527-00

PROPERTY ADDRESS: 1353-1355 FLATBUSH AVENUE
BROOKLYN, NY 11210

PREPARED FOR: FLATBUSH AVE DEVELOPMENT LLC
1910 CONEY ISLAND AVENUE
BROOKLYN, NY

PREPARED BY: SINGER ENVIRONMENTAL GROUP, LTD
5318 NEW UTRECHT AVENUE
BROOKLYN, NY 11219

DATE: NOVEMBER 10, 2004

EXECUTIVE SUMMARY

SITE DESCRIPTION

- This property is known as 1353-1355 FLATBUSH AVENUE, Brooklyn, NY, Block 5227, Lot 16.
- This property consists of a one story plus cellar office building and lot containing a used car lot. (Exhibit A)
- Lot Size:18.25'X85'.
- This property is zoned for "Vacant Land" use.
  Note: The one story office building does not appear on the Building Department Property Profile Overview or the Sanborn History Maps.

ASBESTOS

- NO visible and/or friable ACM was noted during this inspection.

Please note: NO core samples were taken during this inspection, in the event of change in present status, eg, demolition, alteration, modification, all suspect materials should tested and verified free of any ACM.

FUEL OIL STORAGE TANK

- The inactive boiler is gas fired.
- NO tank was noted during this inspection.

PCB's

- NO PCB's were noted during this inspection.

SITE HISTORY

- In reviewing the history of this building and property, a Sanborn Map Search was conducted and it was determined that this property has been Vacant from the 1900's to the 1960's and Parking/Vacant from the 1970's to the 1990's.
- A Certificate of Occupancy Search was conducted and the following Certificate of Occupancy was found:

  Certificate of Occupancy dated October 10, 1949:

  "Vacant space for the sale and display of not more that five (5) used cars."

SCOPE OF THIS PHASE I ENVIRONMENTAL SURVEY

To thoroughly inspect all accessible areas and facilities in and around the one story plus cellar building, and lot located at 1353-1355 FLATBUSH AVENUE, BROOKLYN, New York and to assess the environmental status of the subject property. The tasks were conducted via a visual inspection of the site, review of available historical records documenting uses of the property along with persons knowledgeable about the subject property.

This survey assessed any ongoing or former operations, whether current or former operators/leases used or stored chemicals on the premises, if any waste materials arising from operations have been dumped on the premises or if any landfill operations have taken place.

Visual inspection of the immediate vicinity around the premises were also conducted, wherever possible or reasonable, in order to determine whether any sites adjoining the premises are used for heavy manufacturing or the generation, storage, shipping or disposal of hazardous waste, chemical materials or fuel supplies; if there are any underground or suspended transformer, capacitors, etc. Containing PCB's on the subject property or if there are any underground storage tanks.

As part of this environmental survey, inquiry was made with the U.S. Environmental Protection Agency and appropriate State and Local Agencies in order to ascertain the location of any potential, alleged or known hazardous waste sites within a one half mile radius of subject property. The CERCLIS (Comprehensive Emergency Response, Compensation and Liability Information System) is the U.S. EPA's compilation of such alleged, potential or known hazardous waste sites brought to the attention of the U.S. EPA Office of Emergency and Remedial Response which have been, will be or are currently under investigation for suspected or known environmentally hazardous activities, The National Priorities List (NPL) is the U.S. EPA's listing of known of known contaminated sites which have been targeted for clean-up due to the immediate threat posed to human health and/or the environmental integrity of that property as well as its marketability.

If appropriate, inquiry was also made with the US Environmental Protection Agency and appropriate State and Local agencies regarding their acknowledgment that the presence and/or disposal of hazardous or toxic chemicals, if any, are within their guidelines and compliance.

Recommendations, wherever appropriate, have been given as to the action, if any, which should be taken to confirm with the most current guidelines and rules for compliance as set forth by these agencies.

The Phase I Environmental Survey is limited in budget and scope. No sampling, testing or laboratory analysis is conducted unless so noted and the assessment is based on the professional opinion of the Environmental Consultant. The Phase I Environmental Survey is not and should not be considered a warranty or guarantee about the presence or absence of environmental contaminants which might affect the subject property.

This report was prepared in accordance with ASTM E-1527-00 protocols for Phase I Environmental Site Assessments.

SURROUNDING AREAS

NORTH	RESIDENTIAL/STORES
SOUTH	AUTO REPAIR, RESIDENTIAL/STORES
WEST	LAUNDROMAT
EAST	PRIVATE GARAGE

CHEMICAL OR HAZARDOUS MATERIAL/WASTE STORAGE

- NO chemical or hazardous material/waste storage was noted during this inspection.

EDR(ENVIRONMENTAL DATE RESOURCES) DATABASE SUMMARY

DATABASE	SEARCH DISTANCE	SITES LISTED
SM. QUANTITY GENERATOR	¼ MILE	8
STATE HAZARDOUS WASTE	1 MILE	1
CORRACTS (CORRECTIVE ACTION)	1 MILE	1
LTANKS (LEAKING TANKS)	½ MILE	42
NY SPILLS	<1/8 MILE	0

These should have no affect on the subject property.

CONCLUSIONS AND RECOMMENDATIONS

NO REC's (Recognized Environmental Conditions) was noted on the subject property.

According to Sanborn History Maps the property adjoining to the south of the subject property was used as gasoline station facilities from the 1930's to the 1950's and auto repair facilities from the 1970's to the 1990's.

In the event in any excavation, a Phase II subsurface probe should be conducted to determine the possible presence of any soil/groundwater contamination.

SURVEY FINDINGS

GENERAL

A Phase I Environmental Survey was conducted in and around the property located at 1353-1355 FLATBUSH AVENUE, BROOKLYN, New York beginning with a visual inspection by an Environmental Consultant in all areas where hazardous or potentially toxic materials or substances might be present. A number of environmental risks were assessed during this investigation, including the presence of asbestos-containing materials, aboveground or underground storage tanks, chemical and/or hazardous waste storage and PCB content in electrical equipment. A Phase I Environmental Assessment does not involve any sampling, testing or laboratory analysis of on-site soil or ground water, unless so noted, and, thus, cannot confirm the nature of subsurface soil or ground water quality on the subject property.

SITE DESCRIPTION

According to the Department of Buildings, the subject property is located at the address known as 1353-1355 FLATBUSH AVENUE, Block 5227, Lot 16, in the Borough of BROOKLYN, New York. The subject property currently has one building on it. The Building located at the subject address is one story plus cellar building and lot containing used cars. (Exhibit A)

Note: The one story office building does not appear on the Building Department Property Profile Overview or the Sanborn History Maps.

SITE HISTORY

In reviewing the history of this building and property, a Sanborn Map Search was conducted and it was determined that this property has been Vacant from the 1900's to the 1960's and Parking/Vacant from the 1970's to the 1990's.

A Certificate of Occupancy Search was conducted and the following Certificate of Occupancy was found:

Certificate of Occupancy dated October 10, 1949:

"Vacant space for the sale and display of not more than five (5) used cars."

A Sanborn site history "mapping and geographic" search was conducted for a 100 year span and **18** maps were provided (see documentation).

YEAR	SUBJECT PROPERTY
1907	VACANT
1930	VACANT
1950	VACANT
1968	VACANT
1969	VACANT
1977	PARKING, VACANT
1979	PARKING, VACANT
1980	PARKING, VACANT
1981	PARKING, VACANT
1983	PARKING, VACANT
1987	PARKING, VACANT
1988	PARKING, VACANT
1989	PARKING, VACANT
1990	PARKING, VACANT
1992	PARKING, VACANT
1993	PARKING, VACANT
1995	PARKING, VACANT
1996	PARKING, VACANT

SURROUNDING AREAS	
NORTH (EXHIBIT D)	RESIDENTIAL/STORES
SOUTH (EXHIBIT C)	AUTO REPAIR, RESIDENTIAL/STORES
WEST	LAUNDROMAT
EAST (EXHIBIT B)	PRIVATE GARAGE

ENVIRONMENTAL ASSESSMENT

A visual inspection and interview at the subject property took place on November 1, 2004, by Mr. Shemon Singer, who was accompanied by the building owner, Basirat.

ASBESTOS CONTAINING MATERIALS (ACM)

Asbestos is the generic name for a group of naturally occurring hydrated mineral silicates that are characterized by fibers or bundles of fine single crystal fibers. The New York City Department of Environmental Protection defines asbestos containing materials as "any material which contains more than one percent asbestos by weight." Asbestos materials were used for many years in a variety of ways in building construction due to its excellent acoustic insulating and thermal barrier properties. The durability of asbestos fibers and their small size and fibrous shape make asbestos an unusual environmental contaminant. Water infiltration, contact during routine maintenance and age are major factors breaking down asbestos containing materials and creating exposure problems.

NO VISIBLE AND/OR FRIABLE ACM WAS NOTED DURING THIS INSPECTION.

Please note: NO core samples were taken during this inspection, in the event of change in present status, eg, demolition, alteration, modification, all suspect materials should tested and verified free of any ACM.

Rooms/areas/facilities in the cellar, and first floor areas and lot areas were inspected as part of this survey.

Cellar

Electric Meters, Storage, Oil Boiler	-	No ACM.

First Floor

Office	-	1'X1' Floor Tile, Sheetrock. Electric Heat.

Lot

Used Cars	-	Concrete, Asphalt, Vegetation.

CHEMICAL OR HAZARDOUS MATERIAL/WASTE STORAGE

The rooms/areas/facilities that were inspected as part of this Phase I environmental survey; **NO** storage or use of pesticides were found at the subject property. **NO** distressed vegetation was noted during this inspection.

PRESENCE OF PCBs IN TRANSFORMERS AND OTHER ELECTRICAL EQUIPMENT

An inspection was conducted at the subject property and in the immediate vicinity for the presence of any underground, surface or suspended transformers and visible power supply sources. Oil-containing transformers are known to frequently contain PCBs (Polychlorinated biphenyl's). PCBs are contained in older transformers and other electrical equipment and have the potential for serious health risks. The level of PCB content in such transformers and electrical equipment is regulated by the U.S. Environmental Protection Agency, Regulations 40 CFR Part 761. Upon visual inspection, **NO** suspended transformers power supply sources were identified. Contact with Con Edison has nevertheless been made to determine definitely if any equipment owned and/or maintained by Con Edison located on or in the immediate vicinity of the subject property contain PCB's.

FUEL OIL STORAGE TANKS

The New York State Department of Environmental Conservation regulates the storage and handling of petroleum storage facilities. Aboveground and Underground storage tanks storing petroleum can, if not properly installed and maintained, cause serious environmental problems. Including contamination of a water supply. In an effort to prevent leaks and spills, the Petroleum Bulk Storage Law (Article 17, Title 10 of the Environmental Conservation Law) requires the DEC to develop and enforce a State Code for the storage and handling of petroleum. The resulting regulations are Parts 612, 613 and 614. Any facility with a stationary tank combined capacity exceeding 1,100 gallons must be registered with the New York State Department of Environmental Conservation.

- The inactive boiler is gas fired.
- **NO** tank was noted during this inspection.

RCRA - RESOURCE CONSERVATION AND RECOVERY ACT

RCRA was enacted in 1976 to address the problem of disposing solid waste, hazardous waste, underground storage tanks and medical waste. Subtitle C of the Act establishes a program to manage and regulate hazardous wastes. The objective of the subtitle C program is to ensure that hazardous waste is handled in a manner that protects human health and the environment. Under RCRA, there are three categories of hazardous waste generators: Large quantity generators (LQG), small quantity generators (SQG), and conditionally exempt small quantity generators. LQG are defined as those facilities that generate either 1,000 or more kilograms per month of hazardous waste or 1 kg or more of acutely hazardous waste per month.

LQG and SQG are subject to regulations contained in 40 CFR Part 262: Obtaining and EPA ID number, preparing the waste for transportation, follow storage requirements, manifesting of hazardous waste and record keeping.

This site is NOT listed on the RCRIS and FINDS Databases.

According to EDR Radius Map Search, 1 CORRACTS (Corrective Action) site is located 1/2 to 1 mile radius of the subject property.

According to EDR Radius Map Search, 8 Sm. Quantity Generators are located <1/8 to 1/4 mile radius of the subject property.

These should have NO affect on the subject property.

ADDITIONAL OBSERVATION

An inspection of the immediate vicinity around the subject property was also conducted as part of this Phase I Environmental Assessment.

In addition to the visual inspection, contact was made with the U.S. Environmental Protection Agency regarding the presence of any known, alleged or potential hazardous waste sites located in he immediate vicinity of the subject property which have been brought to the attention of the U.S. EPA Office of Emergency & Remedial Response and included in the Comprehensive Environmental Response, Compensation & Liability Information System (CERCLIS). Based on reports, **NO** such property has been identified as such (see documentation).

A review of the N.Y.S. D.E.C. Inactive Hazardous Waste Disposal Report was conducted. According to their records, **NO** sites have been identified on or near the subject property.

According to EDR Radius Map Search, 1 State Hazardous Waste site is located <1/8 to 1/4 mile radius of the subject property.

This should have NO affect on the subject property.

A radon test was **NOT** conducted at the subject property. Elevated radon levels create a potential health risk, The U.S. EPA and the Center for Disease Control have used a continuous exposure level of 4 pCi/L as a guidance level at or above which further testing and/or remedial action are indicated. There were no records or other evidence that radon testing has been performed at the subject property.

RECOMMENDATIONS

The following are recommendations based on the Phase I Environmental Survey conducted at the property located at 1353-1355 FLATBUSH AVENUE, BROOKLYN, New York.

On November 1, 2004, a Phase I Environmental Assessment of the above-mentioned property were conducted in accordance with the generally accepted assessment protocol. The Phase I environmental assessment relied primarily on visual observation made during inspection and review of available historical documents as they relate to current and past usages of the subject property. Additionally, the immediate vicinity of the subject property was inspected in order to ascertain the likelihood of toxic or hazardous substances or other agents to be present at surrounding locations which might adversely affect the subject site.

As part of the asbestos section of this survey, an inspection of all the aforementioned areas were conducted:

Construction materials on the exterior and interior of the building were also inspected for possible asbestos content.

Within each of these rooms/areas/facilities, piping insulation (e.g. on hot and cold water supply piping), if any, was checked at exposed locations for possible asbestos content.

NO VISIBLE AND/OR FRIABLE ACM WAS NOTED DURING THIS INSPECTION.

Please note: NO core samples were taken during this inspection, in the event of change in present status, eg, demolition, alteration, modification, all suspect materials should tested and verified free of any ACM.

THE FOLLOWING ARE FINDINGS AND RECOMMENDATIONS MADE BY THE SINGER ENVIRONMENTAL CONSULTANT:

THERE IS NO EVIDENCE THAT THIS SITE HAS BEEN USED FOR HEAVY MANUFACTURING, USE AND/OR STORAGE OF CHEMICALS OR FUEL SUPPLIES.

THE SITE TO THE SOUTH OF THE SUBJECT PROPERTY HAS BEEN USED AS A FORMER GASOLINE STATION AND CURRENT AUTO REPAIR.

SEE SITE HISTORY, CONCLUSIONS AND RECOMMENDATIONS.

UPON VISUAL INSPECTION, NO SUSPENDED OR SURFACE TRANSFORMERS WERE IDENTIFIED ON OR IN THE IMMEDIATE VICINITY OF THE SUBJECT PROPERTY.

Contact was made with Con Edison on January 1996 to ascertain whether or not any equipment owned and/or maintained by Con Edison is present in the immediate vicinity of the subject property and , if so, if any contain PCBs. Information provided to Singer Environmental has been that among transformers which have not been tested and determined to contain a quantity of PCBs (designated in ppms (parts per million), public utility companies are permitted to continue operation without restriction. However, if a problem were to arise as a result of a release of dielectric fluid from these transformers, the utility assumes responsibility to adequately mitigate the situation.

RADON

While radon has not been identified by the New York State Health Department as a major problem in the boroughs of New York City, the problem is site-specific and the potential health risk should be assessed.

SOIL & GROUNDWATER

The nature of subsurface soil and ground water at the subject property cannot be confirmed, given the limited budget and scope of this Phase I Environmental Survey.

NO REC's (Recognized Environmental Conditions) was noted on the subject property.

According to Sanborn History Maps the property adjoining to the south of the subject property was used as gasoline station facilities from the 1930's to the 1950's and auto repair facilities from the 1970's to the 1990's.

In the event in any excavation, a Phase II subsurface probe should be conducted to determine the possible presence of any soil/groundwater contamination.

ASBESTOS

According to the Environmental Protection Agency and included in the publication #EPA 560/5-85-024 "Guidance for Controlling Asbestos Containing Materials (ACM) in Buildings " asbestos containing materials are found in three forms: (1) Sprayed or troweled on ceilings and walls and structural steel; (2) in insulation around hot and cold piping, ducts, boilers and tanks; and (3) in a non-friable state in products such as ceilings and floor tiles. Wallboards and outside in materials such as shingles and roofing materials. In general, ACM in the first two categories is of greatest concern, especially if it is friable, causing the materials to release fibers into the air.

ACM are believed to be present on the roof in tars, felts and papers used in roof coatings. These materials are "non-friable" in their present state. In the event of change in present status e.g. demolition, these materials should be tested and verified of any ACM.

Ceiling and floor tile which may contain asbestos are not required to be removed due to their non-friable state.

FUEL OIL STORAGE TANKS

- The inactive boiler is gas fired.
- NO tank was noted during this inspection.

DEPARTMENT OF BUILDINGS

According to the Department of Buildings "Property Profile Overview" dated 11/02/04, NO DOB or ECB violation is "open" at this time.

LTANKS (LEAKING TANKS)

According to an EDR Radius Map search, **42** LTANKS sites were identified <1/8 to 1/2 mile of the subject property.

These should have NO affect on the subject property.

N.Y SPILLS

According to an EDR Radius Map search, **0** spill sites were identified <1/8 mile radius of the subject property.

FIRE DEPARTMENT

A record search at the Fire Department was **NOT** conducted for existing Fire Department violations.

Fire Department violations, if any, should show up on the Title Report.

N.Y.S. D.E.C.

A F.O.I.A. request was submitted to the N.Y.S. Department of Environmental Conservation regarding any spills, PBS (Petroleum Bulk Storage etc.). To date, **NO** response has been received. Upon receipt, an addendum will follow.

N.Y.C. D.E.P.

A F.O.I.A. request was submitted to the N.Y.C. Department of Environmental Protection regarding any violations, etc. To date, **NO** response has been received. Upon receipt, an addendum will follow.

DEPARTMENT OF HEALTH

A F.O.I.A. request was submitted to the Department of Health regarding any violations, etc. To date, **NO** response has been received. Upon receipt, an addendum will follow.

F.O.I.A. REQUESTS MAY BE FORWARD AFTER CLOSING DATE.

Singer Environmental Group, Ltd. has conducted this Phase I Environmental Survey as an aid in determining the presence of potentially toxic or hazardous chemicals or substances as of the date of inspection. Observations are made herein and conclusions drawn are not to be considered as a warranty or guarantee, and are based solely upon those areas directly visible and observable, without the removal or alterations of any item or structure and reflect conditions as on the day of inspection.

Singer Environmental Group, Ltd., their principals and employees are indemnified for any future changes or conditions of deterioration in or on the subject property. Inasmuch as each has made not guarantees of the premises, expressed or implied in connection with this report, any liability which each may have shall be limited to the fee for the inspection of the property.

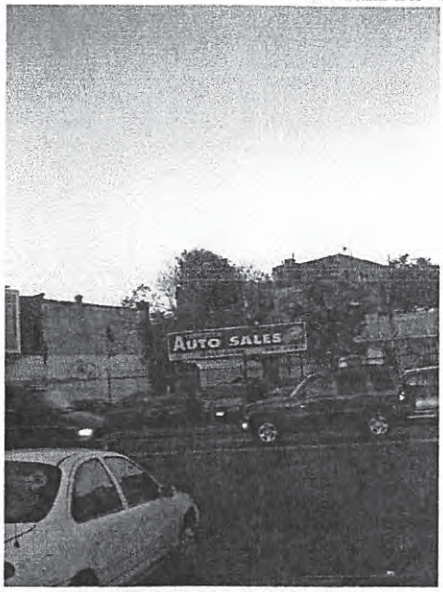
Respectfully Submitted by:

SHEMON SINGER
Environmental Assessment
#6209
Certified

SHEMON SINGER
EAA CERTIFIED ENVIRONMENTAL INSPECTOR
NO. 6209
NOVEMBER 10, 2004

EXHIBIT D (NORTH)

EXHIBIT C (SOUTH)



1353-1355 FLATBUSH AVENUE, BROOKLYN, NY

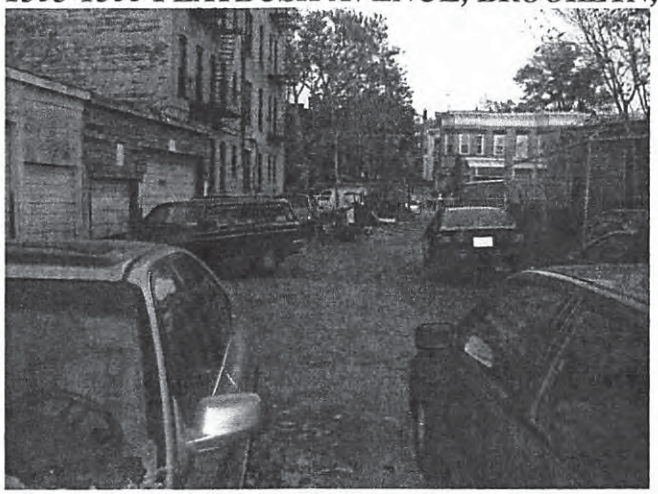


EXHIBIT B (EAST)

Grand Army Plaza
Byrne Park
Central Library
Park Slope
Brooklyn Botanic Gardens
Brower Park
St Johns Park
11213
Eastern Parkway
Litchfield Mansion
Lincoln Terrace Park
11215
Lefferts Homestead
11225
11212
Prospect Park
626 Flatbush Ave
Brownsville
East Flatbush
27
Flatbush
Park Circle
11203
FORT HAMILTON PKWY
27
11226
Kensington
11218
OCEAN PKWY
1355 Flatbush Ave
Paerdegat Park
Parkville
Long Island
Amersfort Park
11210
Jacob Joffe Park
Gravesend Park
11230
11204
Flatlands
OCEAN PKWY
OCEAN PKWY
11229
Marine Park
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NYC BUILDINGS

NYC.gov always open

NYC Department of Buildings

Property Profile Overview

*GEO BIN = 3000000 THUS WORK WITH BIN BELOW

1353 FLATBUSH AVENUE		BROOKLYN 11210		BIN# 3814782	
FLATBUSH AVENUE	1353 - 1353	Health Area	: 74	Tax Block	: 5227
		Census Tract	: 788	Tax Lot	: 16
		Community Board	: 314	Condo	: NO
		Buildings on Lot	: 0	Vacant	: YES

View All Addresses... Browse Block Browse Lot View Certificates of Occupancy

DOB Special Place Name:			
DOB Building Remarks:			
Landmark Status:		**Special Status:**	N/A
Loft Law:	NO	**Local Law:**	NO
SRO Restricted:	NO	**TA Restricted:**	NO
UB Restricted:	NO	**Special District:**	N/A
Little 'E' Restricted:	N/A	**Grandfathered Sign:**	NO
Legal Adult Use:	NO	**City Owned:**	NO
Historic Block:	5227	**Historic Lots:**	16 60
Other BINs:	NONE		
Department of Finance Occupancy Code:		V1-VACANT LAND	

Please Note: The Department of Finance's building classification information shows a building's tax status, which may not be the same as the legal use of the structure. To determine the legal use of a structure, research the records of the Department of Buildings.

	Total	Open
Complaints	0	0
Violations-DOB	1	0
Violations-ECB	0	0
Jobs/Filings	0	
PRA / ARA Jobs	0	
Total Jobs	0	
Actions	10	

OR Enter Action Type:

OR Select from List: Select...

AND Show Actions

- Elevator Records
- Electrical (BEC) Applications
- Permits In-Process / Issued
- Illuminated Signs Annual Permits
- Plumbing Inspections
- Facade Status Information
- Marquee Annual Permits
- Boiler Compliance

If you have any questions please review these Frequently Asked Questions, the Glossary, or call the 311 Citizen Service Center by dialing 311 or (212) NEW YORK outside of New York City.

NYC BUILDINGS

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NYC Department of Buildings

Building Information Search

*NOT A VALID ADDRESS (1)

Property Search | Complaints / Violations | Applications | Boiler Search
Gas Service | Power Authorizations | Elevator Devices

Your Last 10 Searches

1) 1355 FLATBUSH AVENUE BROOKLYN
2) 1353 FLATBUSH AVENUE BROOKLYN
3) 630 FLATBUSH AVENUE BROOKLYN
4) 632 FLATBUSH AVENUE BROOKLYN
5) 626 FLATBUSH AVENUE BROOKLYN
6) 450 UNION STREET BROOKLYN
7) 123 WEST 15TH STREET MANHATTAN
8) 453 WEST 46TH STREET MANHATTAN
9) 515 WEST 46TH STREET MANHATTAN
10) 66-12 70TH ST QUEENS

Search by Property

1 Brooklyn | House No: 1355 | Street: flatbush avenue | GO

2 Pick a Borough | Block: | Lot: | GO

3 Building Identification Number (BIN): | GO

Browse Block and Lot

4 Pick a Borough | Block: | Lot (optional): | GO

Back to top

Search for Complaint or Violation

5 Complaint Number: | GO

6 ECB Violation Number: | GO

7 BIN Number for ECB Violation: | GO

8 Select ECB Viol Type | GO

Start Month: | Start Day: | Start Year:

End Month: | End Day: | End Year:

Back to top

Application Searches

9 BIS Job Number: | Doc Number: | GO

10 Permit Number: | GO

11	BIS Plumbing Work Order Number:	GO
12	Work Orders by Licensee: Select License Type Lic No:	GO
13	C. of O. Application Number: Seq. Number:	GO
14	C. of O. Work Order Number:	GO
15	BEC Application Number:	GO
16	Pick BIS Job Type Select Comm Bd Start Month: Start Day: Start Year: End Month: End Day: End Year:	GO
17	BIS Jobs: Select License Type License Number:	GO
18	ARA Jobs: Select License Type License Number:	GO

Back to top

Boiler Search

19	Pick a Borough Boiler Number:	GO

Back to top

Gas Service Authorization

20	Pick a Borough Start Month: Start Day: Start Year: End Month: End Day: End Year:	GO

Back to top

Power Authorizations Issued

21	Pick a Borough Start Month: Start Day: Start Year: End Month: End Day: End Year:	GO

Back to top

Elevator Device Search

22 Device Number: GO

Back to top

Property Search | Complaints / Violations | Applications | Boiler Search
Gas Service | Power Authorizations | Elevator Devices

If you have any questions please review these Frequently Asked Questions, the Glossary, or call the 311 Citizen Service Center by dialing 311 or (212) NEW YORK outside of New York City.

BIS Menu | Bldg Info Search

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NYC BUILDINGS

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NYC Department of Buildings

Actions

Premises: 1353 FLATBUSH AVENUE BROOKLYN			BIN: 3814782	Block: 5227	Lot: 16
NUMBER		**TYPE**		**FILE DATE**	
ALT 789-030747		ALTERATION		00/00/1903	
ALTA 789-47				00/00/1947	
CC 612-032640		CURB CUT		00/00/1903	
CC 871-050747		CURB CUT		00/00/1905	
CERT 124588-101049	(PDF)	CERTIFICATE OF OCCUPANCY		00/00/1910	
NB 13736-080922		NEW BUILDING		00/00/1908	
NB 11355-091222		NEW BUILDING		00/00/1909	
NC 1479-073040				00/00/1907	
PRS 3037-1351-53-092853		PLUMBING REPAIR SLIP		00/00/1913	
UNK 47DOC9500		UNKNOWN		00/00/0000	

Next

Enter Action Type: Or Select from List: Select... Refresh

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NYC BUILDINGS

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NYC Department of Buildings

Actions

Premises: 1353 FLATBUSH AVENUE BROOKLYN **BIN: 3814782 Block: 5227 Lot: 16**

NUMBER	TYPE	FILE DATE
V* 041686C201V	DOB VIOLATION DISMISSED	04/16/1986

DISMISSAL DATE: 07/17/1986 **AGENCY LICENSE:** **BADGE NO.:**

Previous

Enter Action Type: Or Select from List: Select... Refresh

If you have any questions please review these Frequently Asked Questions, the Glossary, or call the 311 Citizen Service Center by dialing 311 or (212) NEW YORK outside of New York City.

TENTATIVE ASSESSMENT ROLL 2004-2005 | City of New York

Taxable Status Date: January 5, 2004

View 2003 FINAL ASSESSMENT ROLL
View 2004 FINAL ASSESSMENT ROLL

EXPLANATION OF ASSESSMENT ROLL

Parcel Information

◀◀ Previous BBL Next BBL ▶▶

Owner Name:
AGORO, BASIRAT

Property Address and Zip Code:
FLATBUSH AVENUE EXT

Real Estate Billing Name and Address:

Borough: BROOKLYN
Block: 5227
Lot: 16

Tax Class: 4
Building Class: V1 Codes

Land Information

Lot Size	Irregular	Corner
18.25FT X 85.00FT	IRREG	

Building Information

Number of Buildings	Building Size	Extension	Stories
	0.00FT X 0.00FT		

Assessment Information

Description	Land	Total
ESTIMATED MARKET VALUE		52,500
ACTUAL AV	23,625	23,625
ACTUAL EX AV	0	0
TRANS AV	21,780	21,780
TRANS EX AV	0	0

Taxable/Billable Assessed Value

	Assessed Value
SUBJECT TO ADJUSTMENTS, YOUR 2004/05 TAXES WILL BE BASED ON	21,780

Property is assessed at the following uniform percentages of full market value, unless limited to a lesser amount by law:

Class 1 - 8%	Class 2 - 45%	Class 3 - 45%	Class 4 - 45%

Statements List | Select a BBL | Logon to NYCProperty

Go To: Finance Home Page | NYC.gov Home Page | Contact NYC.gov | FAQs | Privacy Statement | Site Map

SINGER
environmental group

November 2, 2004

Department of Health
Patricia J. Caruso
Records Access Officer
125 Worth Street
Room 604 - Box 31
New York, N.Y. 10013

RE: F.O.I.A. Request

To Whom It May Concern:

Please provide any information on the premises located at the following address as soon as possible.

This is a Freedom of Information Request for the premises referenced above. We would like information concerning Underground Storage Tanks, site contamination, air emissions, drinking water quality, hazardous waste materials, spills and leaks and any other Environmental concerns that would affect the property.

RE: 515 WEST 46TH STREET, NEW YORK, NY
453 WEST 46TH STREET, NEW YORK, NY
123 WEST 15TH STREET, NEW YORK, NY
450 UNION STREET, BROOKLYN, NY
626-632 FLATBUSH AVENUE, BROOKLYN, NY
1353-1355 FLATBUSH AVENUE, BROOKLYN, NY

Our FAX number is (718) 437-0082. Thank you very much.

Sincerely,

Erica Hogan

5318 New Utrecht Avenue Brooklyn, New York 11219
T: 718.437.9600 F: 718.437.0082 E: singenv@aol.com

Form 54-32M-70148 - 114

DEPARTMENT OF HOUSING AND BUILDINGS

HMJ BOROUGH OF Brooklyn , CITY OF NEW YORK

No.

Date OCT 10 1949

CERTIFICATE OF OCCUPANCY

(Standard form adopted by the Board of Standards and Appeals and issued pursuant to Section 646 of the New York Charter, and Sections C.26-181.0 to C26-187.0 inclusive Administrative Code 2.1.3.1. to 2.1.3.7. Building Code.)

This certificate supersedes C. O. No.

To the owner or owners of the building or premises:

THIS CERTIFIES that the ~~new~~—altered—~~existing~~—building—premises located at 1353 Flatbush Avenue, E/S, 146'-7 3/4" S. of Foster Avenue

Block 5227 Lot 16

, conforms substantially to the approved plans and specifications, and to the requirements of the building code and all other laws and ordinances, and of the rules and regulations of the Board of Standards and Appeals, applicable to a building of its class and kind at the time the permit was issued; and

CERTIFIES FURTHER that, any provisions of Section 646F of the New York Charter have been complied with as certified by a report of the Fire Commissioner to the Borough Superintendent.

~~NxExxxAkxNx~~— Alt. 789/47 Construction classification— Vacant Land

Occupancy classification— Sale and Display of not more than Five (5) Used Cars Height -- stories, -- feet.

Date of completion— Const.- 9/27/49 Located in Business Use District.

10' Area Pl.- None Height Zone at time of issuance of permit

This certificate is issued subject to the limitations hereinafter specified and to the following resolutions of the Board of Standards and Appeals: (Calendar numbers to be inserted here).

PERMISSIBLE USE AND OCCUPANCY

STORY	LIVE LOADS Lbs. per Sq. Ft.	PERSONS ACCOMMODATED			USE
		MALE	FEMALE	TOTAL	

Use Vacant Space (18'-3½" x 54') for the Sale and Display of not more than Five (5) Used Cars.

Total - As Stated Above

Borough Superintendent.

C. Sheres

SINGER
environmental group

November 2, 2004

ATTN: F.O.I.L DEPARTMENT - N.Y.S. D.E.C.

HERE ARE INFORMATION REQUESTS THAT WE NEED A RESPONSE TO AS SOON AS POSSIBLE, PLEASE:

RE: 515 WEST 46TH STREET, NEW YORK, NY
453 WEST 46TH STREET, NEW YORK, NY
123 WEST 15TH STREET, NEW YORK, NY
450 UNION STREET, BROOKLYN, NY
626-632 FLATBUSH AVENUE, BROOKLYN, NY
1353-1355 FLATBUSH AVENUE, BROOKLYN, NY

PBS -

SPILLS -

CBS -

MOSF -

AST/UST -

VIOLATIONS/

INSPECTIONS -

Thank you,

Erica Hogan

5318 New Utrecht Avenue Brooklyn, New York 11219
T: 718.437.9600 F: 718.437.0082 E: singenv@aol.com

SINGER
environmental group

November 2, 2004

Department of Environmental Protection
59-17 Junction Blvd.
8th Floor
Corona, New York 11373

Attn: Marie Dooley

RE: F.O.I.A. Request

To Whom It May Concern:

Please provide any information on the premises located at the following address as soon as possible.

RE: 515 WEST 46TH STREET, NEW YORK, NY
453 WEST 46TH STREET, NEW YORK, NY
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450 UNION STREET, BROOKLYN, NY
626-632 FLATBUSH AVENUE, BROOKLYN, NY
1353-1355 FLATBUSH AVENUE, BROOKLYN, NY

Our FAX number is (718) 437-0082. Thank you very much.

Sincerely,

Erica Hogan

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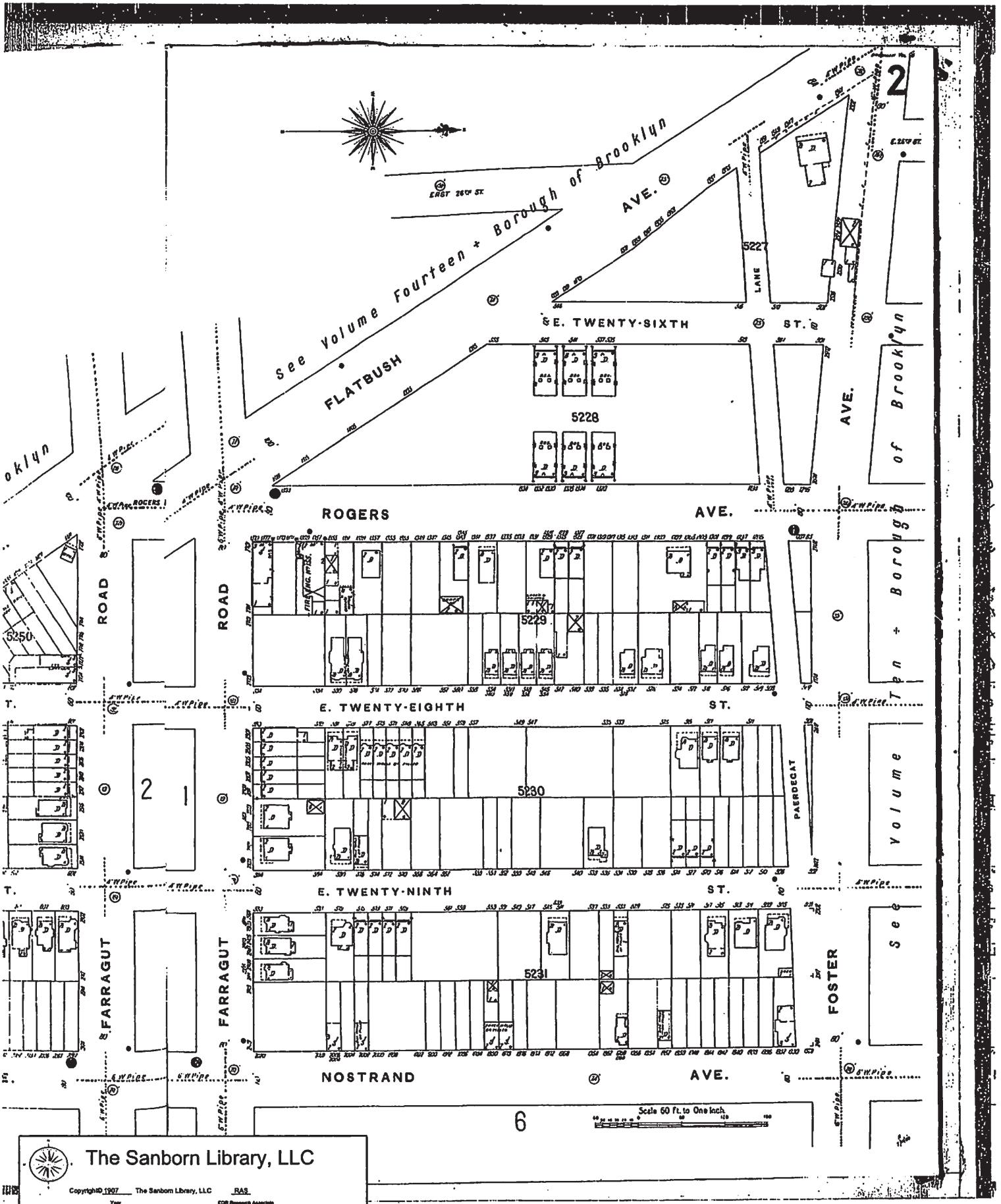

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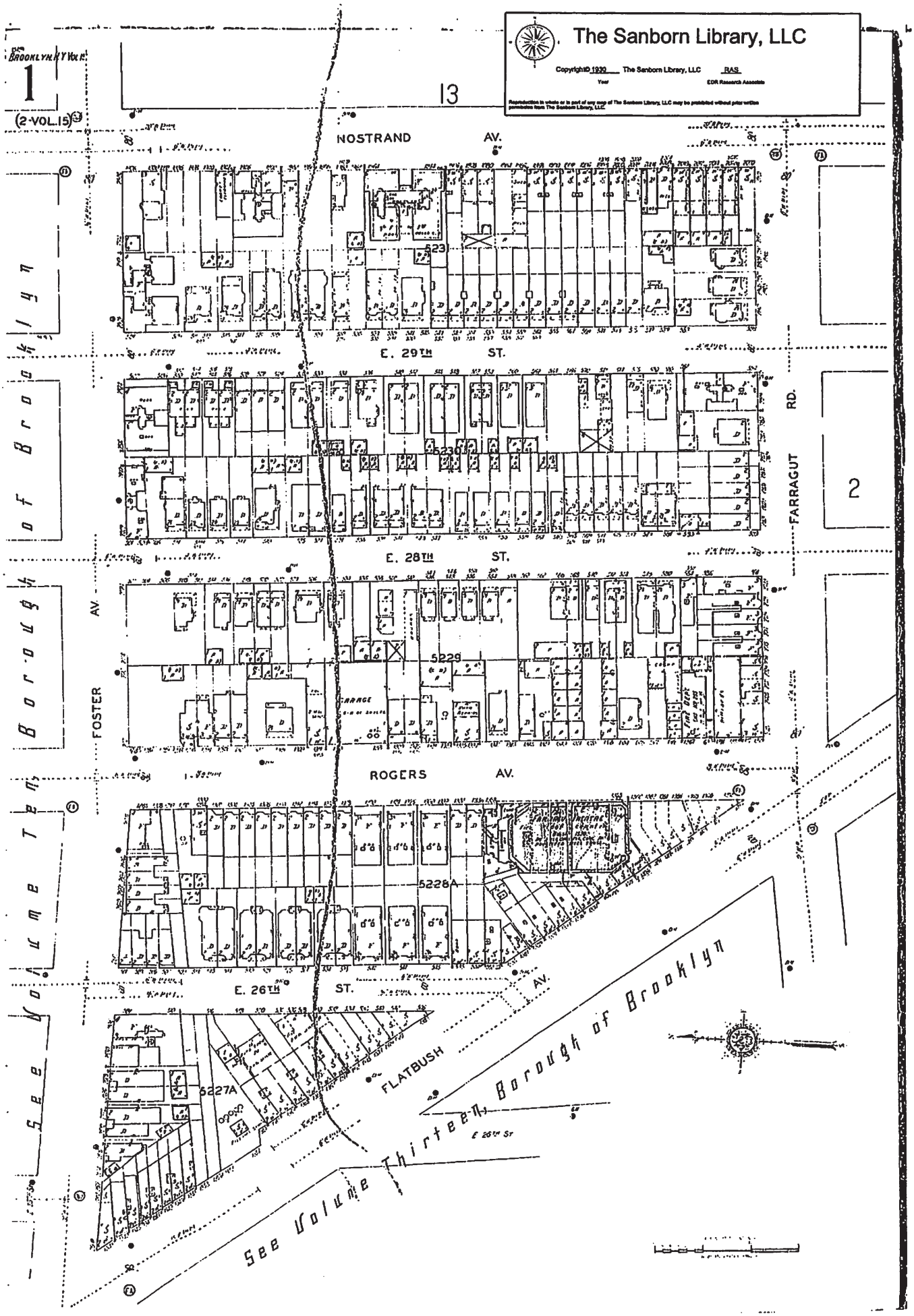
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Borough of Brooklyn

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GARAGE

FARRAGUT THEATRE

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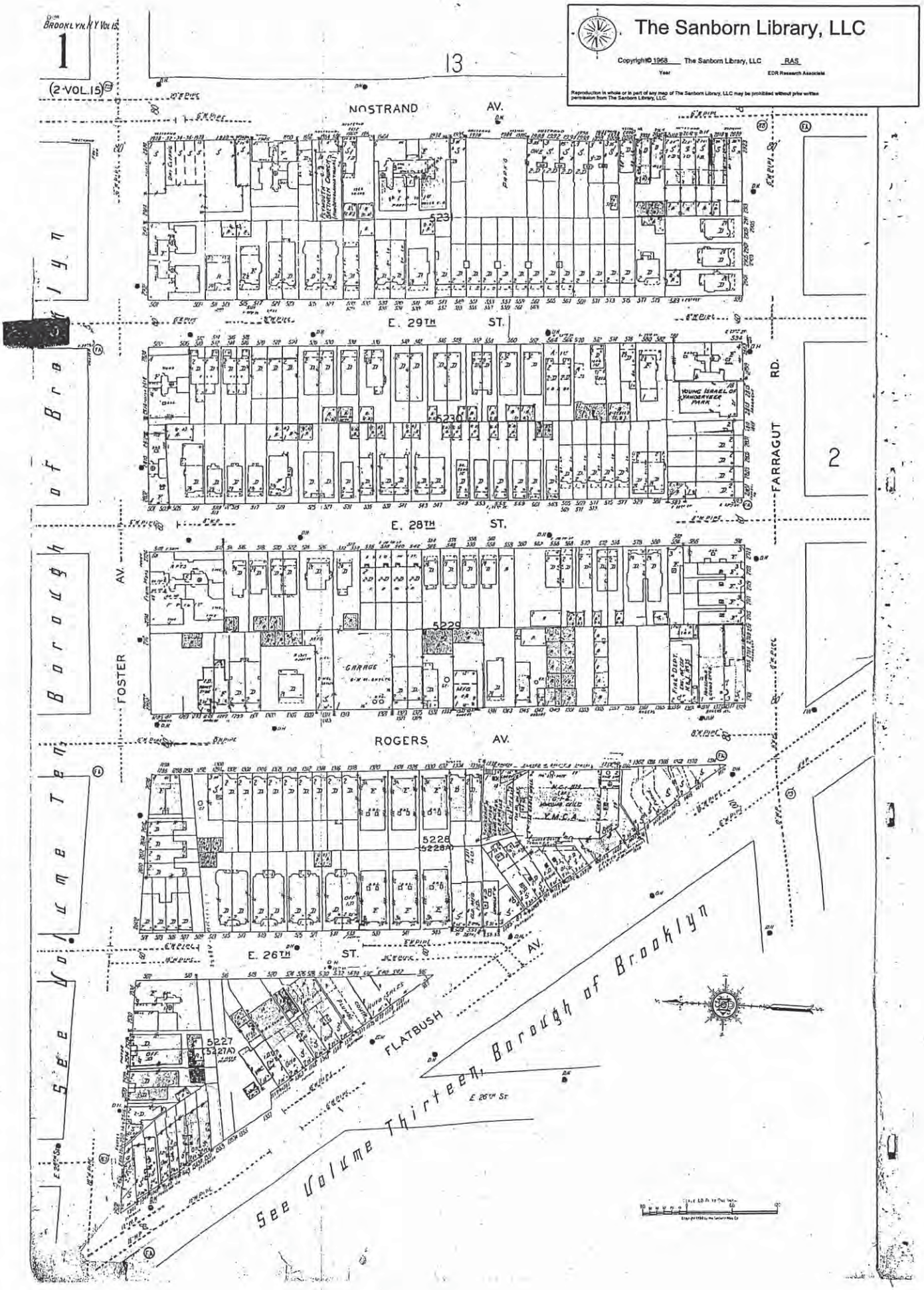
See Volume Thirteen

E 25th St



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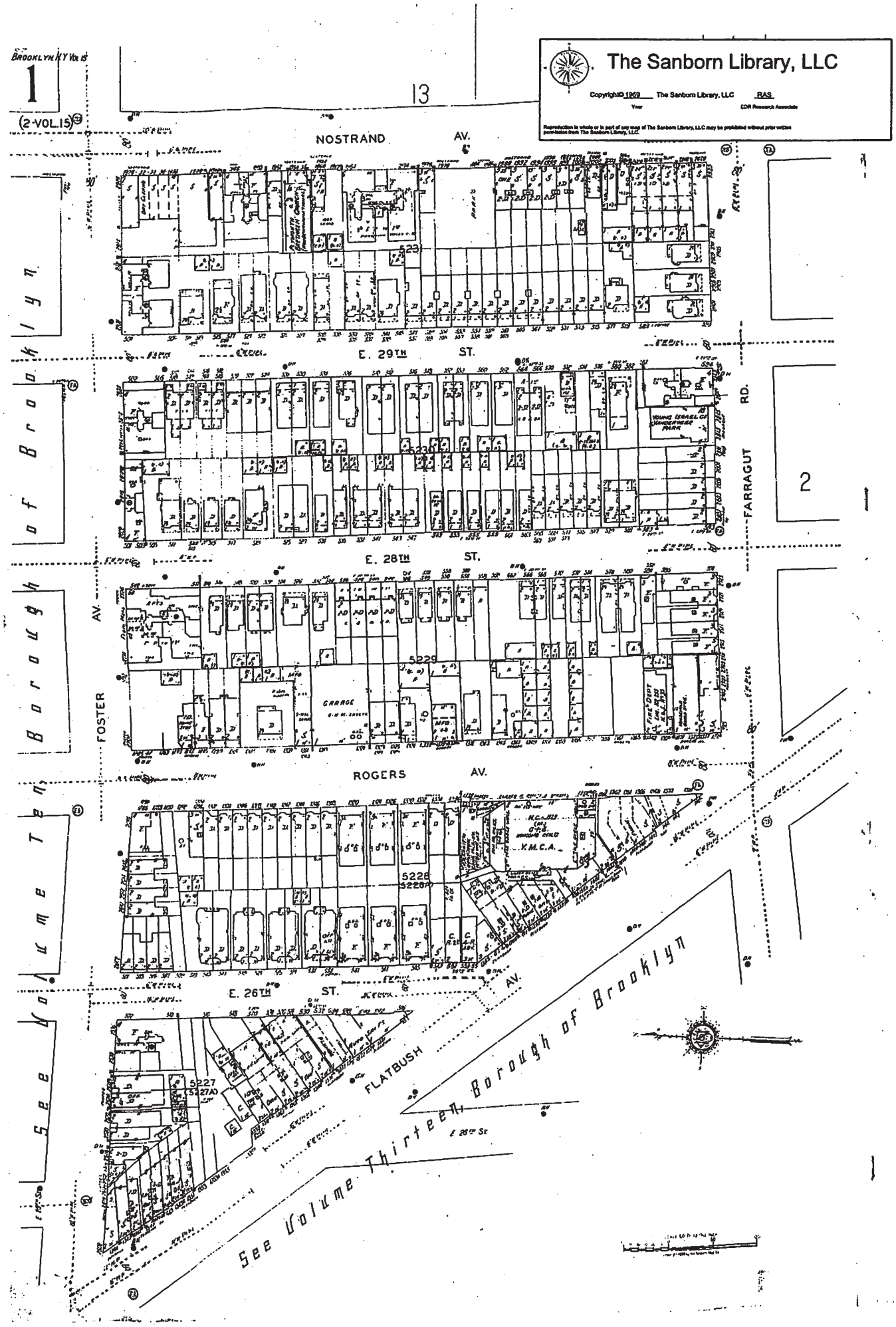

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E 26th St

SCALE OF FEET
60 30 0 60 120

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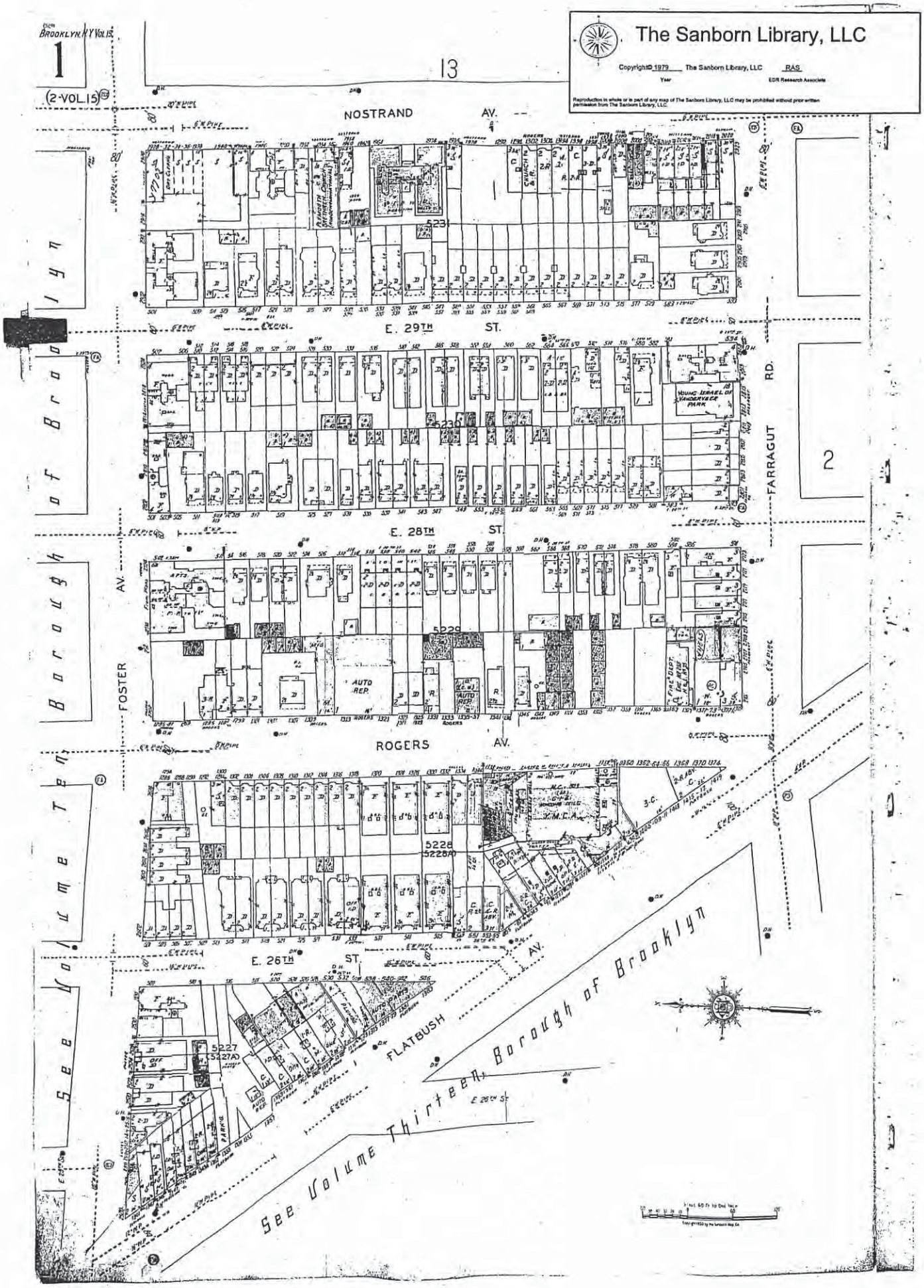

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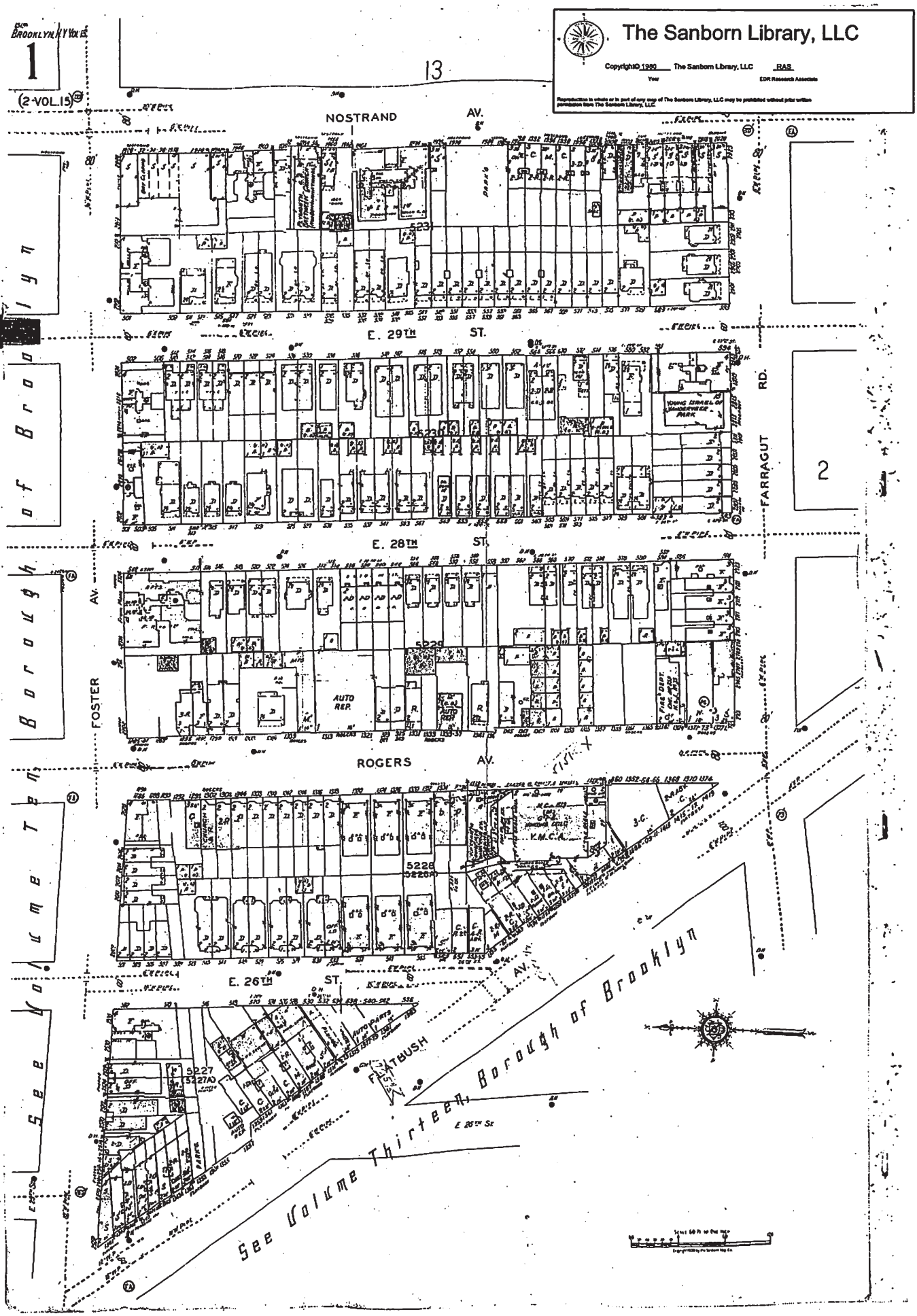

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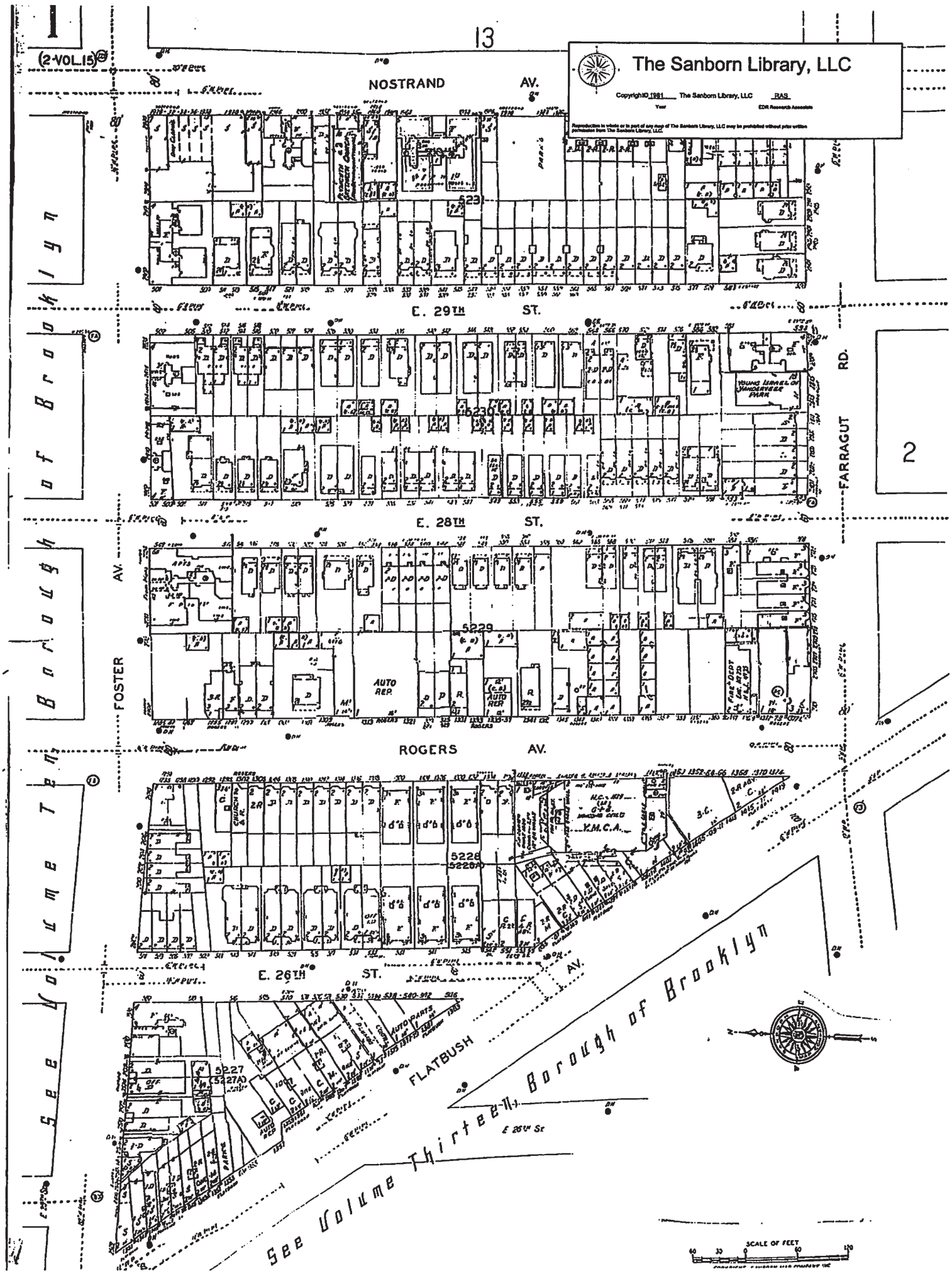

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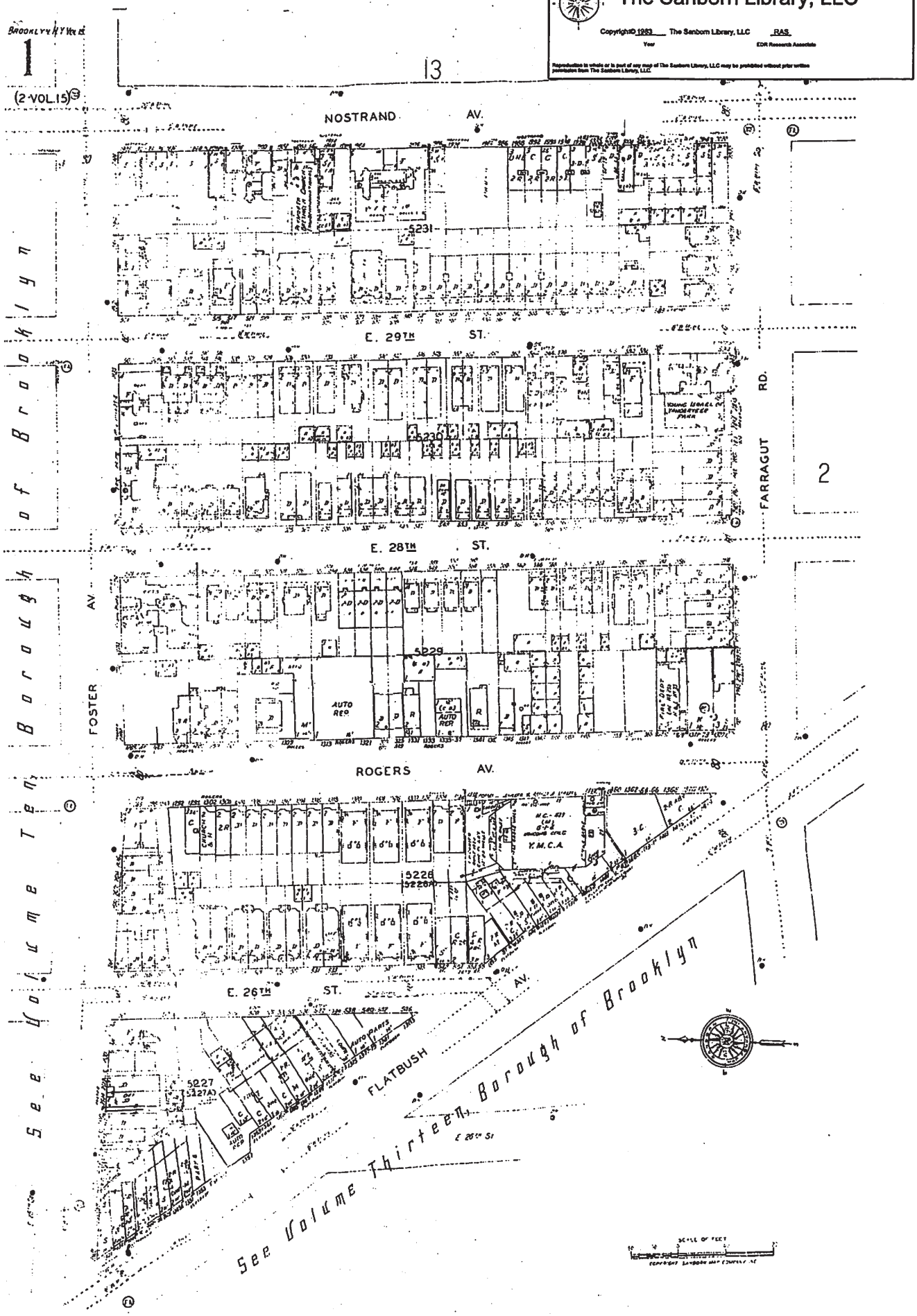

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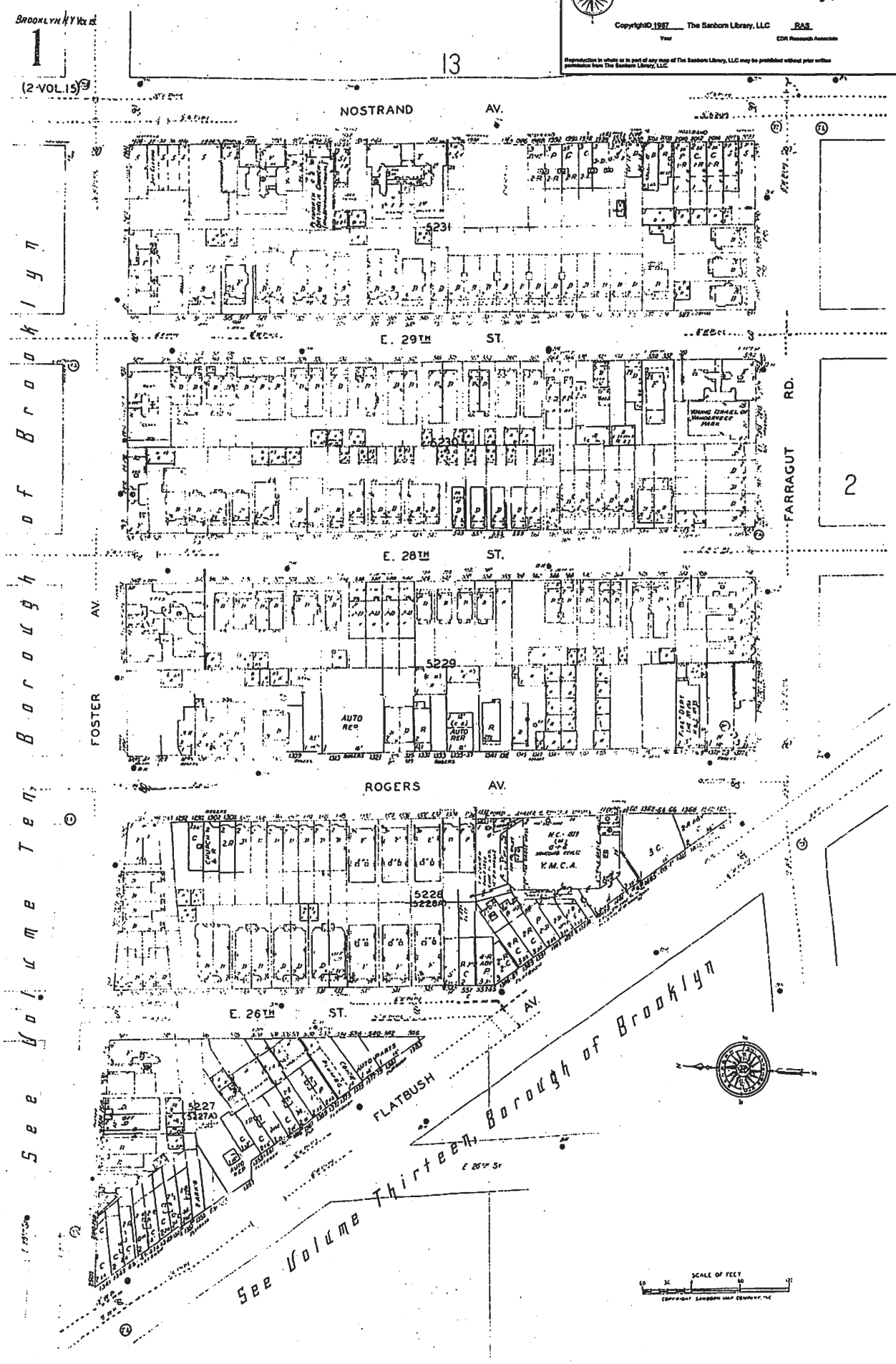

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BROOKLYN, N.Y. VOL. 15

1

(2-VOL. 15)

13

NOSTRAND AV.

E. 29TH ST.

E. 28TH ST.

ROGERS AV.

E. 26TH ST.

FLATBUSH AV.

FARRAGUT RD.

FOSTER AV.

5231

5230

5229

5228

5228A

5227

5227A

2

YOUNG ISRAEL OF WINCHESTER PARK

AUTO REP.

CHURCH

Y.M.C.A.

See Volume Thirteen, Borough of Brooklyn

See Volume Thirteen, Borough of Brooklyn

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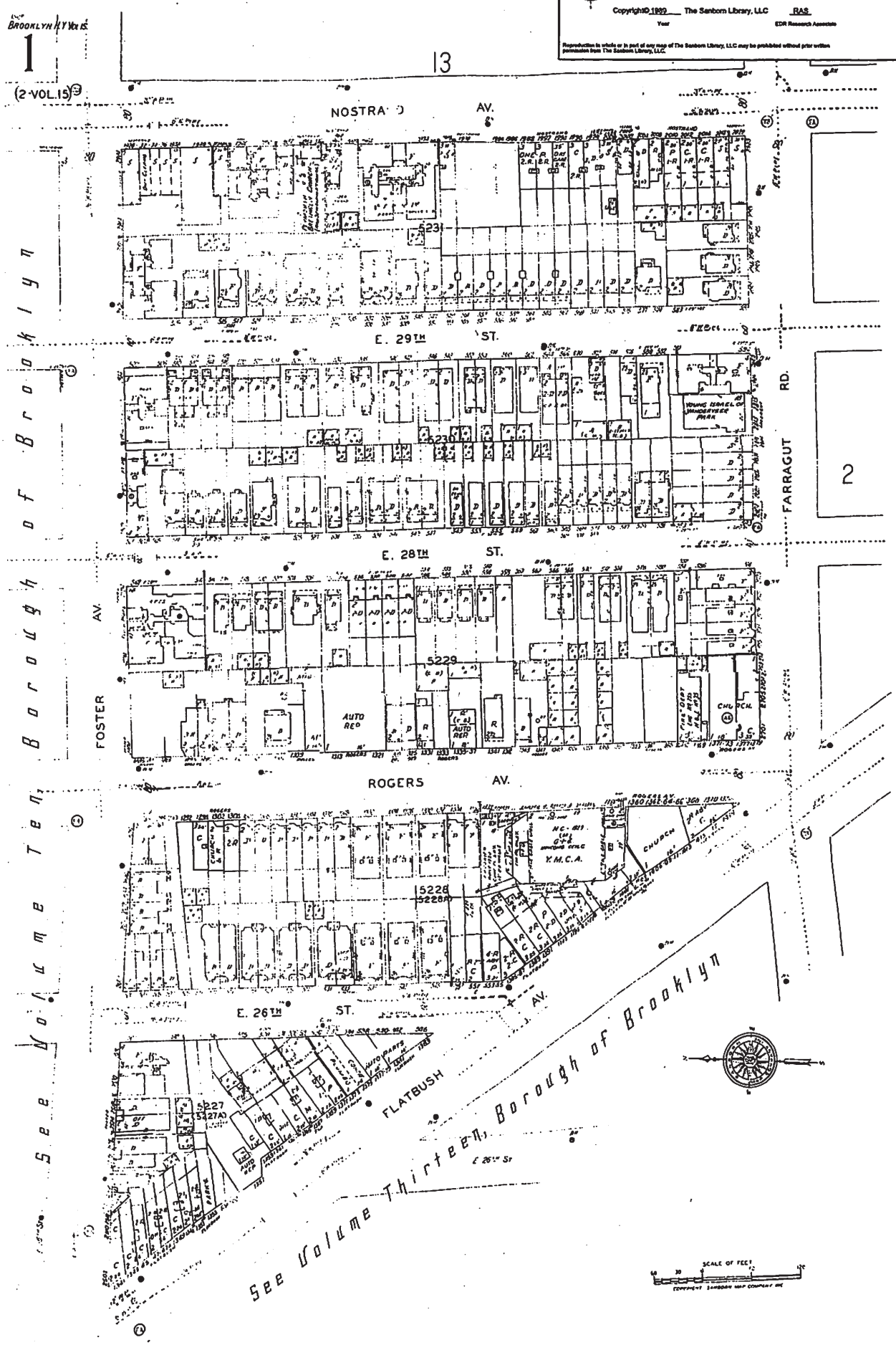

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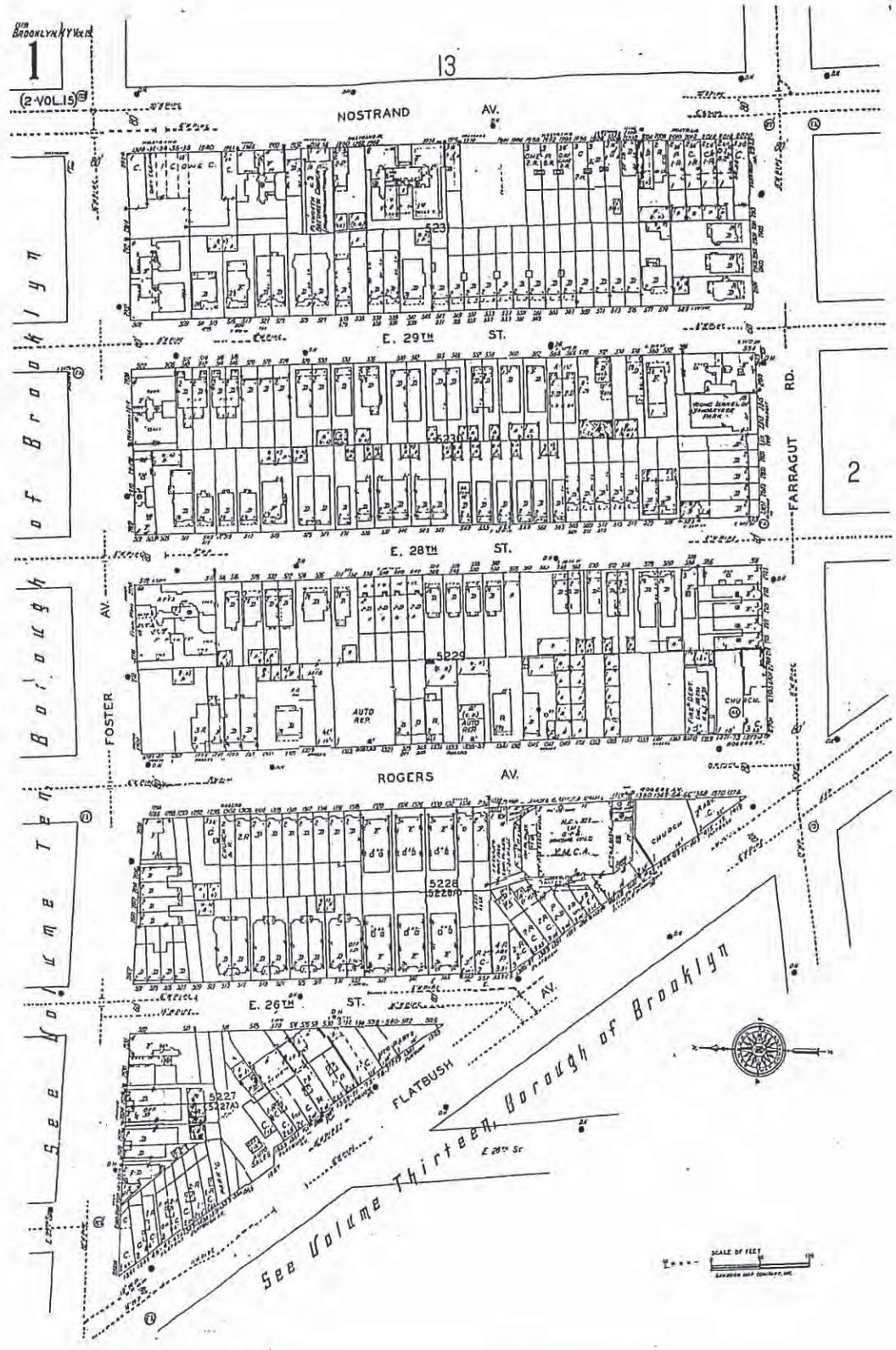

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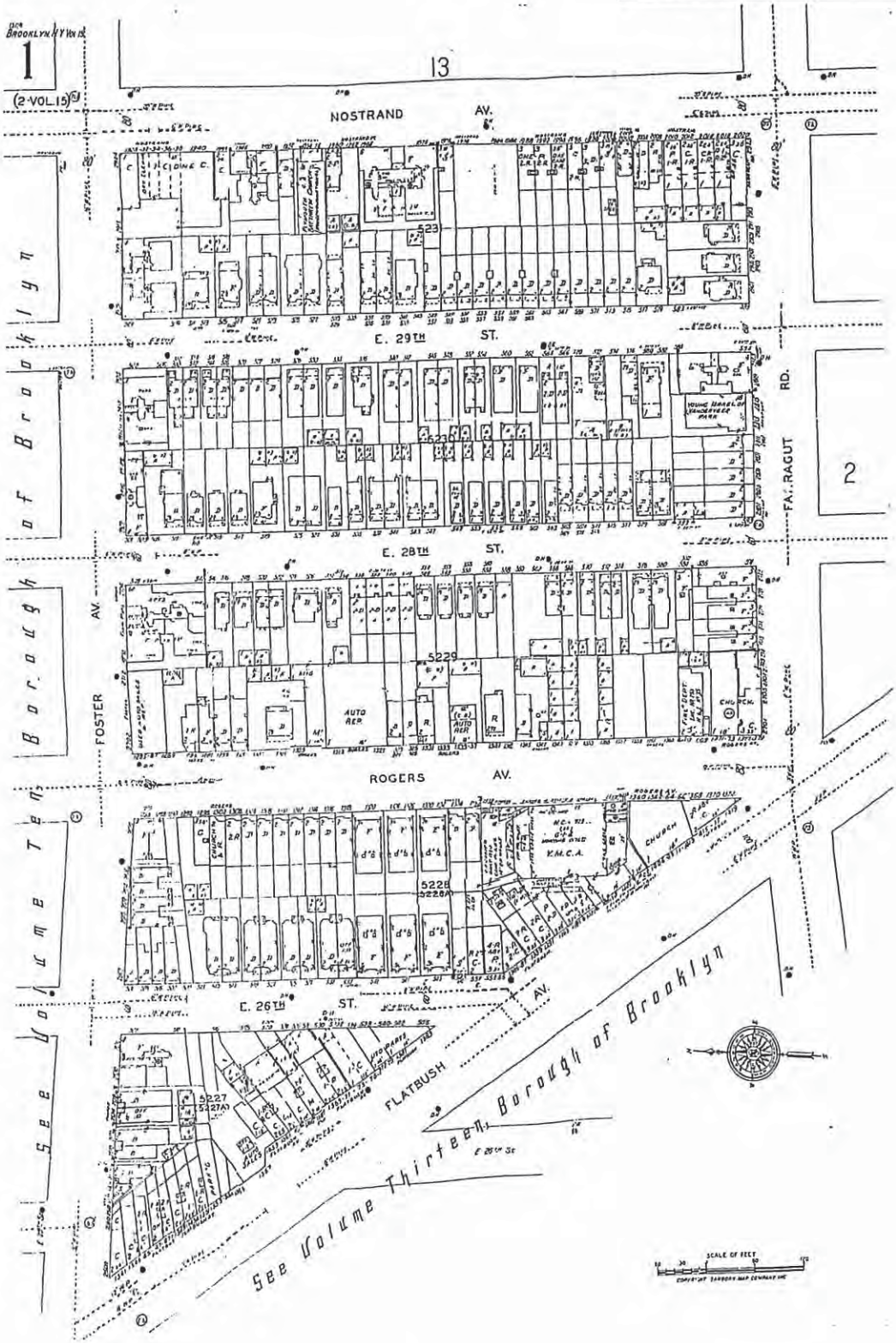

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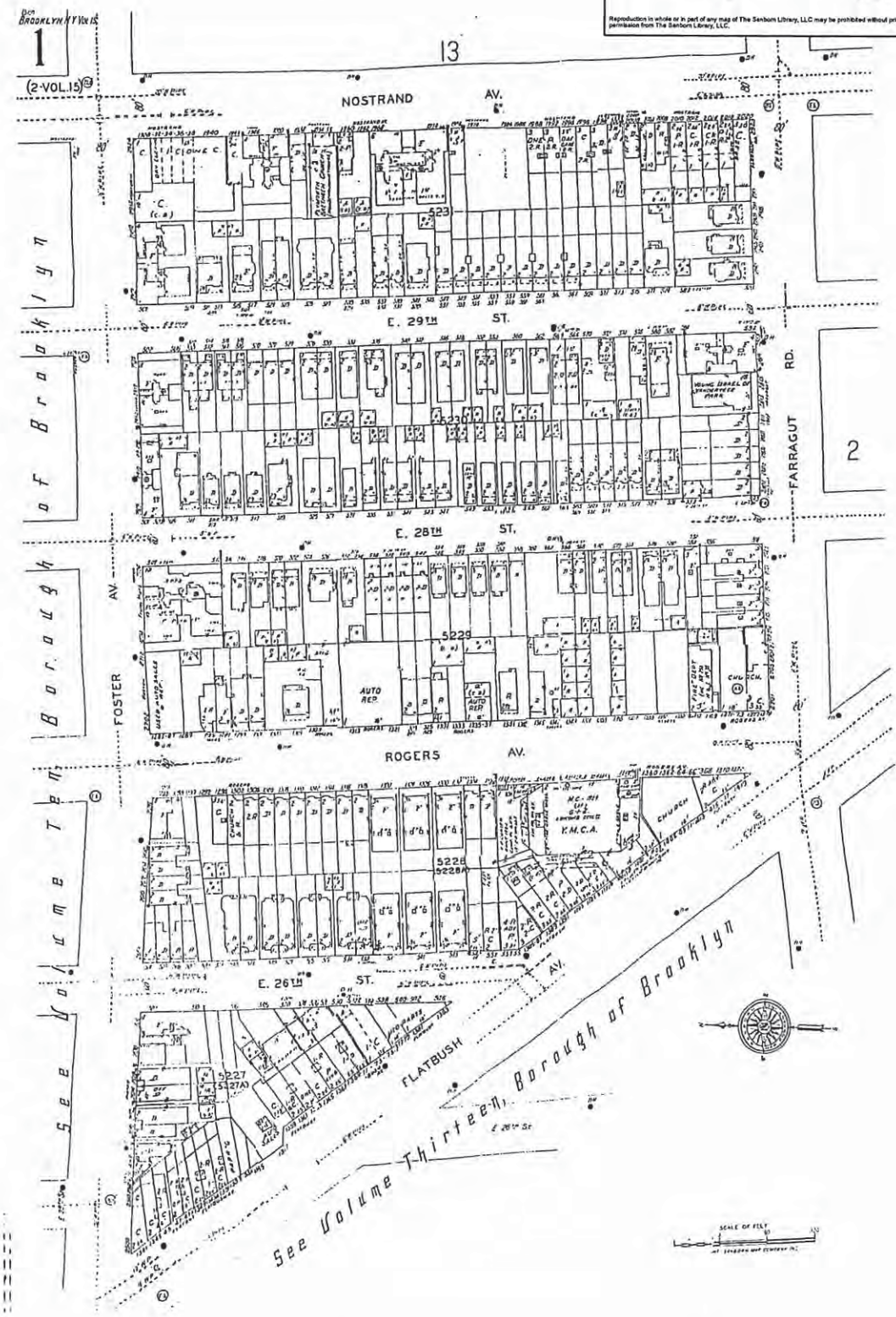

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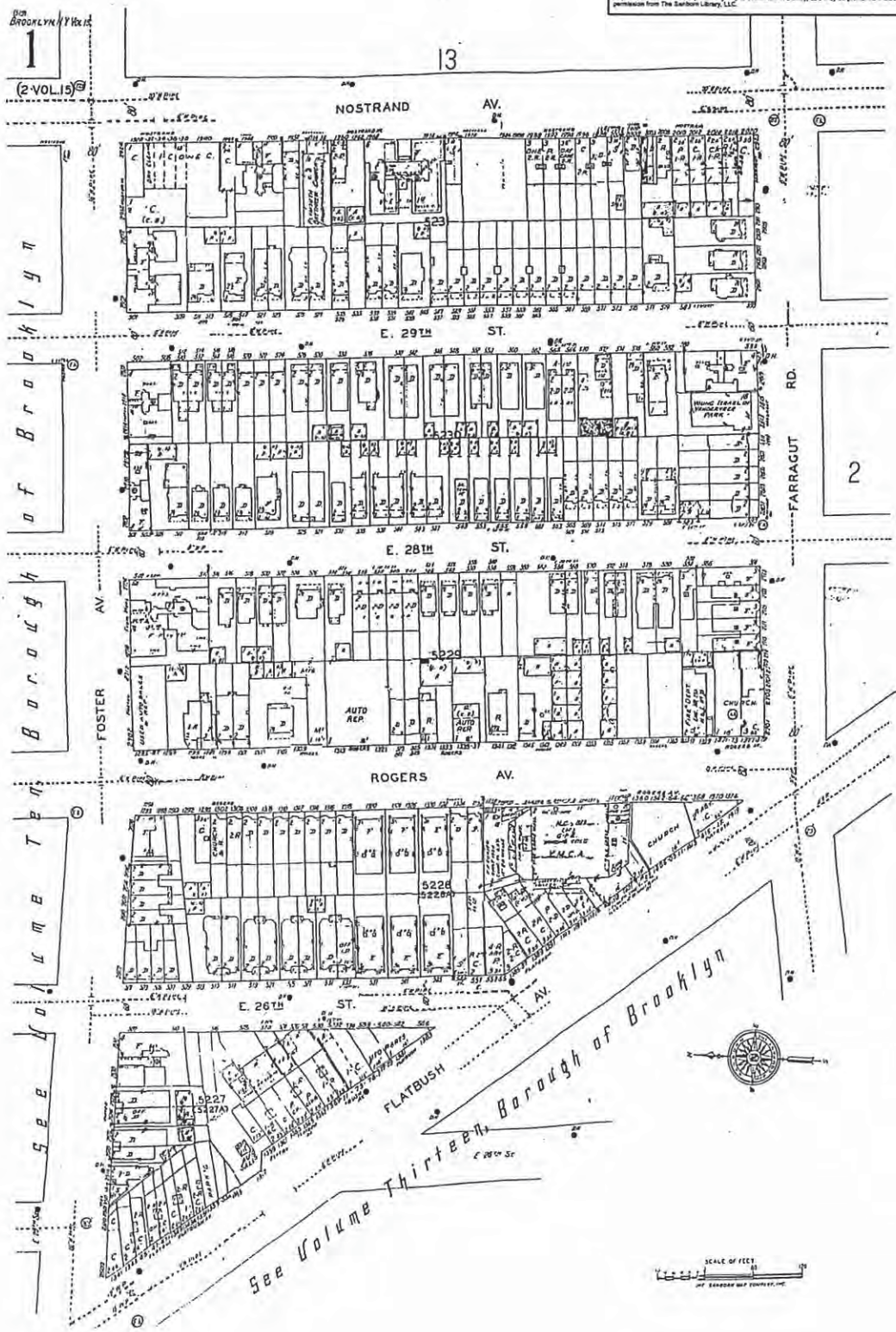

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EDR™ Environmental
Data Resources Inc

The EDR Radius Map™ Report

1353-1355 FLATBUSH AVENUE
1353 FLATBUSH AVENUE
BROOKLYN, NY 11210

Inquiry Number: 01298689.1r

November 01, 2004

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06460

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

FORM-GIL

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GEOCHECK ADDENDUM

GeoCheck - Not Requested

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The report meets the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00. Search distances are per ASTM standard or custom distances requested by the user.

TARGET PROPERTY INFORMATION

ADDRESS

1353 FLATBUSH AVENUE
BROOKLYN, NY 11210

COORDINATES

Latitude (North):	40.637900 - 40° 38' 16.4"
Longitude (West):	73.953000 - 73° 57' 10.8"
Universal Tranverse Mercator:	Zone 18
UTM X (Meters):	588537.6
UTM Y (Meters):	4498877.5
Elevation:	27 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property:	40073-F8 BROOKLYN, NY
Source:	USGS 7.5 min quad index

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the ASTM E 1527-00 search radius around the target property for the following databases:

FEDERAL ASTM STANDARD

NPL..... National Priority List
Proposed NPL..... Proposed National Priority List Sites
CERCLIS..... Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP..... CERCLIS No Further Remedial Action Planned
RCRIS-TSD..... Resource Conservation and Recovery Information System
RCRIS-LQG..... Resource Conservation and Recovery Information System
ERNS..... Emergency Response Notification System

STATE ASTM STANDARD

SWF/LF..... Facility Register

EXECUTIVE SUMMARY

CBS UST	Chemical Bulk Storage Database
MOSF UST	Major Oil Storage Facilities Database
SWTIRE	Registered Waste Tire Storage & Facility List
SWRCY	Registered Recycling Facility List

FEDERAL ASTM SUPPLEMENTAL

CONSENT	Superfund (CERCLA) Consent Decrees
ROD	Records Of Decision
Delisted NPL	National Priority List Deletions
FINDS	Facility Index System/Facility Identification Initiative Program Summary Report
HMIRS	Hazardous Materials Information Reporting System
MLTS	Material Licensing Tracking System
MINES	Mines Master Index File
NPL Liens	Federal Superfund Liens
PADS	PCB Activity Database System
INDIAN RESERV	Indian Reservations
FUDS	Formerly Used Defense Sites
UMTRA	Uranium Mill Tailings Sites
ODI	Open Dump Inventory
DOD	Department of Defense Sites
RAATS	RCRA Administrative Action Tracking System
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
SSTS	Section 7 Tracking Systems
FTTS INSP	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

STATE OR LOCAL ASTM SUPPLEMENTAL

HSWDS	Hazardous Substance Waste Disposal Site Inventory
AST	Petroleum Bulk Storage
CBS AST	Chemical Bulk Storage Database
MOSF AST	Major Oil Storage Facilities Database
NY Spills	Spills Information Database
DEL SHWS	Delisted Registry Sites
AIRS	Air Emissions Data
SPDES	State Pollutant Discharge Elimination System

EDR PROPRIETARY HISTORICAL DATABASES

Coal Gas	Former Manufactured Gas (Coal Gas) Sites

BROWNFIELDS DATABASES

US BROWNFIELDS	A Listing of Brownfields Sites
Brownfields	Brownfields Site List

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

EXECUTIVE SUMMARY

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

FEDERAL ASTM STANDARD

CORRACTS: CORRACTS is a list of handlers with RCRA Corrective Action Activity. This report shows which nationally-defined corrective action core events have occurred for every handler that has had corrective action activity.

A review of the CORRACTS list, as provided by EDR, and dated 06/15/2004 has revealed that there is 1 CORRACTS site within approximately 1 mile of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
R A LEATHER FINISH CO INC	***812 E 43 ST***	***1/2 - 1 E***	***75***	***100***

RCRIS: Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs): generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs): generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs): generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

A review of the RCRIS-SQG list, as provided by EDR, and dated 08/10/2004 has revealed that there are 8 RCRIS-SQG sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
MIKLIN FRENCH CLEANERS	***1329 FLATBUSH AVE***	***0 - 1/8 NW***	***3***	***6***
COURTESY CLEANERS	***1250 FLATBUSH AVENUE***	***0 - 1/8 NW***	***4***	***7***
SPARTAN PETROLEUM	275 FOURTH AVE	1/8 - 1/4 NW	A11	13
DELRIO OIL CORP	1267 FLATBUSH AVE	1/8 - 1/4 NW	A14	19
MR FOSTER	***2604 BEDFORD AVE 2D***	***1/8 - 1/4 NNW***	***17***	***22***
ODESSA OIL CORP	1257 FLATBUSH AVE	1/8 - 1/4 NW	D22	27
SETCO INC	***101-01 AVE D***	***1/8 - 1/4 NW***	***F39***	***49***

Lower Elevation	Address	Dist / Dir	Map ID	Page
MIRACLE AUTO BODY	***1333 ROGERS AVE***	***0 - 1/8 ESE***	***5***	***7***

Associated Environmental Services, Ltd.

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25 Central Avenue
Hauppauge, NY 11788
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Fax: 234-4297

Eastern Suffolk
P.O. Box 695
Shoreham, NY 11786
(631) 744-8900
Fax: 744-6025

TANK CLOSURE REPORT

1357 FLATBUSH AVENUE
BROOKLYN, NEW YORK 11210

NYSDEC SPILL NO. 06-00423

Prepared for:

Mr. Yakov Mordechai
3032 Nostrand Avenue
Brooklyn, New York 11229
&
New York State Department of Environmental Conservation
Region 2
47-40 21st Street
Long Island City, New York 11101-5407

Report Date: June 30, 2006

Prepared by:

Associated Environmental Services, Ltd.
25 Central Avenue
Hauppauge, New York 11788

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Laboratory Report and Chain of Custody ..... Appendix B

Site Photographs ..... Appendix C

1.0 INTRODUCTION

Associated Environmental Services, Ltd. (AES) was retained to conduct the tank closure activities for the subject site located at 1357 Flatbush Avenue, Brooklyn, New York. The tank closure activities were conducted from April through June 2006. The following report summarizes the tank closure activities.

1.1 Site Background

The subject site is an irregular shaped parcel, which is improved with a one (1) story automobile repair building. A Phase I Environmental site Assessment (ESA) report was prepared for the subject site by Singer Environmental Group, LTD. The findings of the Phase I ESA revealed that the site was utilized as a gasoline filling station from the 1930s to the 1950s.

Based upon the findings of the Phase I ESA, it was determined that a Limited Subsurface Investigation would be conducted at the subject site. AES was retained to perform a Limited Subsurface Investigation at the site in August 2005. The scope of work entailed a magnetometer survey and subsurface soil sampling. The results of the magnetometer survey revealed the presence of subsurface anomalies which were consistent with possible underground storage tanks (USTs). A total of four (4) soil borings were installed at the site. Please note that due to accessibility restrictions, the borings were not able to be installed in the immediate area of the suspect USTs. Representative soil samples were collected continuously from ground surface to the soil/water interface which was determined to be approximately twenty-two (22) feet below grade. The soil samples collected from twenty (20) to twenty-two (22) feet below grade were submitted for laboratory analysis. The analytical data for the soil samples revealed that there were no contaminants present at concentrations which exceeded the respective New York State Department of Environmental Conservation (NYSDEC) Recommended Soil Cleanup Objectives (RSCOs). Based upon the findings of the magnetometer survey it was determined that the USTs would be excavated and removed from the site.

2.0 SITE DESCRIPTION

2.1 Site Location

The subject site is located at 1357 Flatbush Avenue, Brooklyn, New York. The site is located on the east side of Flatbush Avenue. The site can be accessed via one (1) curb cut along Flatbush Avenue. The subject site is an irregular shaped parcel of land which measures approximately 4,000 square feet. The site is identified on the tax maps as Block 5227 and Lot 13.

2.2 Site Improvements

The subject site is improved with a one (1) story automobile repair building, with no basement. The subject building measures approximately 1,000 square feet. The subject building is currently vacant. There was evidence of five (5) vent lines noted along the north side of the subject building. In addition, there was evidence of five (5) former remote fill ports noted along the west (front) side of the subject property. The remainder of the site is improved with driveways and parking areas as well as pedestrian sidewalks.

The site is located in a highly developed residential and retail neighborhood. The subject site was noted to be in poor condition. The relevant site features are depicted on Figure 1.0 – Site Diagram.

2.3 Hydrogeologic Setting

The surface topography at the site was noted to be relatively level throughout. The regional topographic gradient is sloped downward to the Southwest.

The subsurface lithology at the site consisted of a brown coarse grain sand with pebbles. Groundwater is located at approximately twenty-two (22) feet below grade. Fresh groundwater originates in the form of precipitation. This precipitation will infiltrate into the subsurface and act as the recharge mechanism for replenishing water. Groundwater beneath the site is classified as GA, as per the New York State Department of Environmental Conservation (NYSDEC) "Water Quality Regulations - Surface Water and Groundwater Classifications and Standards".

3.0 TANK CLOSURE ACTIVIITES

The tank closure activities were conducted at the subject site from April through June 2006. The following sections summarize the work conducted, the field observations and data collected, laboratory analytical data, as well as any other pertinent site information which may have been obtained during the performance of the closure activities. Photographs were taken to document the field activities and are included with this report as Appendix C.

3.1 Tank Removal

A Track Excavator was utilized at the site for the purpose of removing any underground storage tanks (USTs) which were present at the site, specifically in the vicinity of the subsurface anomalies. It was determined that there was five (5) – 550 gallon gasoline USTs and one (1) – 300 gallon fuel oil UST present at the site. The gasoline USTs were noted to be encased in concrete.

A vacuum truck was utilized to remove a total of approximately 3,705 gallons of gasoline/water from the tanks and the tank vault. The liquid was transported offsite by AB Oil Service LTD. The NYSDEC transporter identification number for AB Oil Service LTD is 1A-002. A copy of the waste manifest for the liquids is included with this report as Appendix A.

The concrete encasement was broken up and removed from the subsurface. As the track excavator removed the subsurface soil in the vicinity of the USTs representative grab samples were continually collected for field inspection. The grab samples were visually inspected for possible evidence of contamination. In addition, the samples were field screened with a photo-ionization detector (PID) for the presence of volatile organic compounds (VOCs). Any soils which exhibited visual evidence of contamination and/or elevated PID field screening readings were deemed to be contaminated. Any contaminated soil was stockpiled on-site for future disposal. Any non-contaminated soil remained on-site for use as backfill. The gasoline and fuel oil USTs were removed and braced on the ground for inspection. There was no evidence of deterioration such as holes or pitting noted in any of the USTs. There was evidence of contamination such as petroleum odors and staining noted in the soil surrounding the gasoline USTs. It appears that the contamination is related to a historical failure of the UST piping system. The New York State Department of Environmental Conservation (NYSDEC) was notified and spill no. 06-00423 was assigned to the site. The impacted soil was excavated and stockpiled on-site for future disposal. At the time of the removal activities it was estimated that approximately eighty-eight (88) cubic yards of contaminated soil had been excavated and stockpiled for disposal. The soil was covered with poly sheeting and secured. The six (6) USTs were loaded onto trailers and transported off-site for disposal at a licensed scrap metal facility.

3.2 Contaminated Soil Removal

A representative sample of the contaminated soil was collected for waste characterization purposes. The sample analysis indicated that the soil could be disposed of as a solid non-hazardous waste.

The contaminated soil was loaded onto trailers and transported off site for disposal. The contaminated soil was disposed of at Clean Earth of Carteret, Inc., 24 Middlesex Avenue, Carteret, New Jersey 07008. Based upon the weight tickets it was determined that a total of 114.85 tons of contaminated soil was removed from the site and properly disposed of at Clean Earth of Carteret, Inc. Copies of the waste manifests and weight tickets are included with this report as Appendix A.

3.3 End-Point Sampling

As per the requirements of the New York State Department of Environmental Conservation (NYSDEC) representative end-point soil samples were collected from the sidewalls and bottom of the excavation pit. There was no field evidence of contamination noted in any of the end-point soil samples which were collected.

In order to characterize the nature of the subsurface in the vicinity of the five (5) gasoline USTs it was determined that eight (8) soil samples would be submitted for laboratory analysis. A total of two (2) soil samples were submitted for analysis from the area of the fuel oil UST. The end-point sampling locations are depicted on Figure 2.0 – End-Point Sample Locations.

The end-point soil samples were submitted for analysis of volatile organic compounds (VOCs) utilizing EPA Method 8021 (STARS) and for semi-volatile organic compounds (SVOCs) utilizing EPA Method 8270 (STARS). The samples were immediately stored on ice and delivered to a New York State Department of Health (NYSDOH) certified laboratory for analysis. The laboratory chosen for this investigation was Long Island Analytical Laboratories Inc., which is located in Holbrook, Long Island, New York. The NYSDOH Environmental Laboratory Approval Program (ELAP) certification number for the laboratory is 11693.

The analytical results for the soil samples were compared to the Recommended Soil Cleanup Objectives (RSCOs) listed in the NYSDEC New York State Department of Environmental Conservation (NYSDEC) Division Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046: Determination of Soil Cleanup Objectives and Cleanup Levels.

The analytical results for the eight (8) end-point soil samples from the area of the five (5) gasoline USTs revealed that there were no VOCs detected at concentrations which exceeded the respective NYSDEC RSCOs. There were concentrations of SVOCs detected above the NYSDEC RSCOs in all of the samples, with the exception of the east sidewall and bottom-east samples.

The analytical results for the two (2) end-point samples collected from the fuel oil UST revealed that there were no VOCs or SVOCs detected at concentrations which exceeded the respective NYSDEC RSCOs.

The analytical results for the soil samples collected are summarized in Table 1 and Table 2. Complete laboratory analytical reports and chain of custody forms are included with this report as Appendix B.

TABLE 1
Soil Analytical Data - End-Point Samples
EPA Method 8021 (STARS) - Volatile Organic Compounds (VOCs)

ANALYTICAL PARAMETERS	NYSDEC RSCOs	West Wall	East Wall	North-east Wall	North-west Wall	South-east Wall
MTBE	120	<5	<5	<5	<5	<5
Benzene	60	<5	<5	<5	<5	<5
n-Butylbenzene	18,000	<5	<5	<5	<5	11
sec-Butylbenzene	25,000	<5	<5	<5	<5	<5
tert-Butylbenzene	10,000	<5	<5	<5	<5	<5
Isopropylbenzene	5,000	<5	<5	<5	5	<5
p-Isopropyltoluene	11,000	<5	<5	<5	<5	<5
n-Propylbenzene	14,000	<5	<5	<5	7	<5
Ethylbenzene	5,500	<5	<5	<5	13	<5
Naphthalene	13,000	<5	<5	<5	10	<5
Toluene	1,500	<5	<5	<5	63	<5
1,2,4-Trimethylbenzene	13,000	<5	<5	<5	108	<5
1,3,5-Trimethylbenzene	3,300	<5	<5	64	57	49
Xylenes	1,200	<15	<15	67	310	34

Notes:
1. All results are in ug/Kg (parts per billion - ppb).
2. The Recommended Soil Cleanup Objectives are listed in the New York State Department of Environmental Conservation (NYSDEC) Division Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046: Determination of Soil Cleanup Objectives and Cleanup Levels.
3. Total VOCs not to exceed 10,000 ppb.

TABLE 1 (continued)
Soil Analytical Data - End-Point Samples
EPA Method 8021 (STARS) - Volatile Organic Compounds (VOCs)

ANALYTICAL PARAMETERS	NYSDEC RSCOs	South-west Wall	Bottom East	Bottom West	Bottom Fuel Oil	North Wall Fuel Oil
MTBE	120	<5	<5	<5	<5	<5
Benzene	60	<5	<5	<5	<5	<5
n-Butylbenzene	18,000	<5	<5	<5	<5	<5
sec-Butylbenzene	25,000	<5	<5	<5	<5	<5
tert-Butylbenzene	10,000	<5	<5	<5	<5	<5
Isopropylbenzene	5,000	<5	<5	<5	<5	<5
p-Isopropyltoluene	11,000	<5	<5	<5	<5	<5
n-Propylbenzene	14,000	<5	<5	<5	<5	<5
Ethylbenzene	5,500	<5	<5	<5	<5	<5
Naphthalene	13,000	<5	<5	31	<5	<5
Toluene	1,500	<5	<5	<5	<5	<5
1,2,4-Trimethylbenzene	13,000	<5	<5	40	<5	<5
1,3,5-Trimethylbenzene	3,300	7	<5	26	<5	<5
Xylenes	1,200	<15	<15	30	<15	<15

Notes:
1. All results are in ug/Kg (parts per billion - ppb).
2. The Recommended Soil Cleanup Objectives are listed in the New York State Department of Environmental Conservation (NYSDEC) Division Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046: Determination of Soil Cleanup Objectives and Cleanup Levels.
3. Total VOCs not to exceed 10,000 ppb.

TABLE 2 Soil Analytical Data - End-Point Samples EPA Method 8270 (STARS) - Semi-Volatile Organic Compounds (SVOCs)						
ANALYTICAL PARAMETERS	**NYSDEC RSCOs**	**West Wall**	**East Wall**	**North-east Wall**	**North-west Wall**	**South-east Wall**
Naphthalene	13,000	<40	<40	494	53	303
Anthracene	50,000	115	<40	1,122	171	140
Fluorene	50,000	<40	<40	457	50	143
Phenanthrene	50,000	660	<40	7,051	780	580
Pyrene	50,000	1,397	<40	9,245	798	2,549
Acenaphthene	50,000	<40	<40	671	69	79
Benzo(a)anthracene	224 or MDL	563	<40	3,078	374	1,464
Fluoranthene	50,000	1,853	<40	11,523	1,035	2,037
Benzo-b-fluoranthene	1,100	822	<40	4,171	882	420
Benzo-k-Fluoranthene	1,100	315	<40	1,160	239	276
Chrysene	400	597	<40	3,814	721	481
Benzo(a)pyrene	61 or MDL	466	<40	2,474	526	421
Benzo(g,h,i)perylene	50,000	508	<40	2,083	445	365
Indeno(1,2,3-cd)pyrene	3,200	369	<40	1,612	343	191
Dibenzo(a,h)anthracene	14 or MDL	112	<40	449	57	<40

Notes:
1. All results are in ug/Kg (parts per billion - ppb).
2. The Recommended Soil Cleanup Objectives are listed in the New York State Department of Environmental Conservation (NYSDEC) Division Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046: Determination of Soil Cleanup Objectives and Cleanup Levels.
3. Total SVOCs not to exceed 500,000 ppb.

TABLE 2 (continued) Soil Analytical Data - End-Point Samples EPA Method 8270 (STARS) - Semi-Volatile Organic Compounds (SVOCs)						
ANALYTICAL PARAMETERS	**NYSDEC RSCOs**	**South-west Wall**	**Bottom East**	**Bottom West**	**Bottom Fuel Oil**	**North Wall Fuel Oil**
Naphthalene	13,000	338	<40	64	<40	<40
Anthracene	50,000	58	<40	53	<40	<40
Fluorene	50,000	73	<40	<40	<40	<40
Phenanthrene	50,000	292	<40	307	<40	<40
Pyrene	50,000	2,112	<40	530	<40	<40
Acenaphthene	50,000	43	<40	<40	<40	<40
Benzo(a)anthracene	224 or MDL	**1,208**	<40	**226**	<40	<40
Fluoranthene	50,000	1,399	<40	641	<40	<40
Benzo-b-fluoranthene	1,100	410	<40	267	<40	<40
Benzo-k-Fluoranthene	1,100	114	<40	102	<40	<40
Chrysene	400	181	<40	252	<40	<40
Benzo(a)pyrene	61 or MDL	**219**	<40	**161**	<40	<40
Benzo(g,h,i)perylene	50,000	230	<40	176	<40	<40
Indeno(1,2,3-cd)pyrene	3,200	135	<40	132	<40	<40
Dibenzo(a,h)anthracene	14 or MDL	<40	<40	**52**	<40	<40

Notes:
1. All results are in ug/Kg (parts per billion - ppb).
2. The Recommended Soil Cleanup Objectives are listed in the New York State Department of Environmental Conservation (NYSDEC) Division Technical and Administrative Guidance Memorandum (TAGM) HWR-94-4046: Determination of Soil Cleanup Objectives and Cleanup Levels.
3. Total SVOCs not to exceed 500,000 ppb.

4.0 CONCLUSIONS & RECOMMENDATIONS

4.1 Tank Closure Activities

The tank closure activities were conducted at the subject site from April through June 2006. The scope of work entailed the removal of five (5) – 550 gallon gasoline underground storage tanks (USTs) and one (1) – 300 gallon fuel oil UST present at the site. The gasoline USTs were noted to be encased in concrete.

A vacuum truck was utilized to remove a total of approximately 3,705 gallons of gasoline/water from the tanks and the tank vault. The liquid was transported offsite by AB Oil Service, LTD. A Track Excavator was utilized to remove the USTs. The gasoline and fuel oil USTs were removed and braced on the ground for inspection. There was no evidence of deterioration such as holes or pitting noted in any of the USTs. There was evidence of contamination such as petroleum odors and staining noted in the soil surrounding the gasoline USTs. It appears that the contamination is related to a historical failure of the UST piping system. The New York State Department of Environmental Conservation (NYSDEC) was notified and spill no. 06-00423 was assigned to the site. The impacted soil was excavated and stockpiled on-site for future disposal. The six (6) USTs were loaded onto trailers and transported off-site for disposal at a licensed scrap metal facility. A total of 114.85 tons of contaminated soil was loaded onto trailers and transported off site for disposal. The contaminated soil was disposed of at Clean Earth of Carteret, Inc.

In order to characterize the nature of the subsurface in the vicinity of the five (5) gasoline USTs it was determined that eight (8) soil samples would be submitted for laboratory analysis. A total of two (2) soil samples were submitted for analysis from the area of the fuel oil UST. The analytical results for the eight (8) end-point soil samples from the area of the five (5) gasoline USTs revealed that there were no volatile organic compounds (VOCs) detected at concentrations which exceeded the respective NYSDEC Recommended Soil Cleanup Objectives (RSCOs). There were concentrations of semi-volatile organic compounds (SVOCs) detected above the NYSDEC RSCOs in all of the samples, with the exception of the east sidewall and bottom-east samples. The analytical results for the two (2) end-point samples collected from the fuel oil UST revealed that there were no VOCs or SVOCs detected at concentrations which exceeded the respective NYSDEC RSCOs.

It should be noted that the contaminated soil was excavated to the greatest extent possible. Any limitations of the excavation area were due to the size of the subject property and access problems with the adjacent property.

A copy of the Tank Closure Report is being forwarded for review to Mr. Hiralkumar Patel, Environmental Engineer for the NYSDEC. The NYSDEC will make all final determinations regarding any further investigative and/or remedial actions that may be warranted.

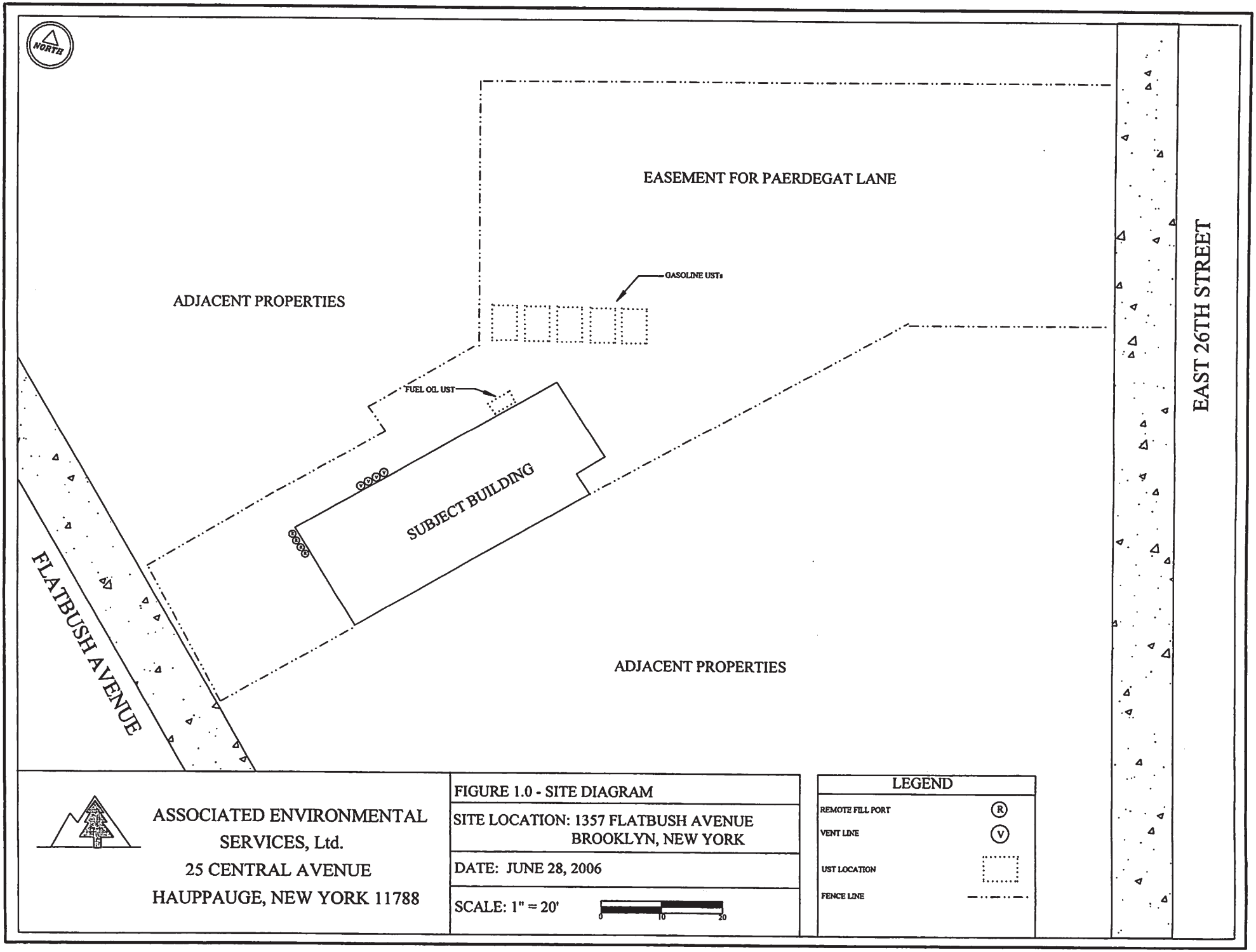
Should you have any questions please do not hesitate to call. Thank you for your time in this matter.

Prepared By:

Matthew Boeckel
Project Manager / Hydrogeologist
Associated Environmental Services, Ltd.

John Schrotzmayer
President
Associated Environmental Services, Ltd.

Figures



ASSOCIATED ENVIRONMENTAL SERVICES, Ltd.
25 CENTRAL AVENUE
HAUPPAUGE, NEW YORK 11788

FIGURE 1.0 - SITE DIAGRAM

SITE LOCATION: 1357 FLATBUSH AVENUE
BROOKLYN, NEW YORK

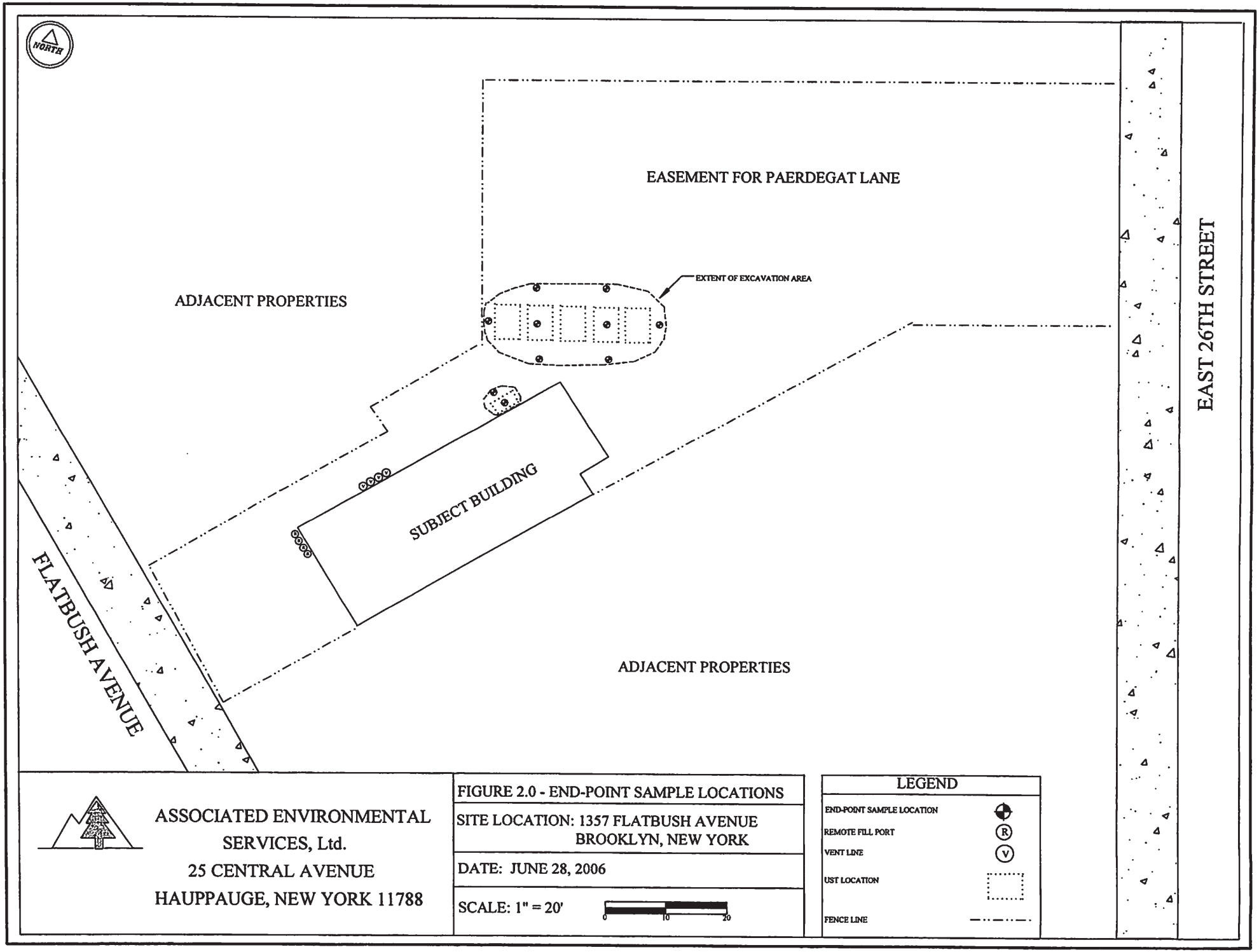
DATE: JUNE 28, 2006

SCALE: 1" = 20'

0 10 20

LEGEND

REMOTE FILL PORT	(R)
VENT LINE	(V)
UST LOCATION	
FENCE LINE	



ASSOCIATED ENVIRONMENTAL SERVICES, Ltd.
25 CENTRAL AVENUE
HAUPPAUGE, NEW YORK 11788

FIGURE 2.0 - END-POINT SAMPLE LOCATIONS

SITE LOCATION: 1357 FLATBUSH AVENUE
BROOKLYN, NEW YORK

DATE: JUNE 28, 2006

SCALE: 1" = 20'

0 10 20

LEGEND

- END-POINT SAMPLE LOCATION
- REMOTE FILL PORT (R)
- VENT LINE (V)
- UST LOCATION
- FENCE LINE

Waste Disposal Manifests & Weight Tickets

Non-Hazardous Manifest

Manifest Doc No.20905

Generator

Generator ID: 15394
REPAIR SHOP
1357 FLATBUSH AVENUE
BROOKLYN, NY
6317670484

Transporter

A B OIL SERVICE LTD.
6315676545
NYD987023371
1A-002

Facility

A B OIL SERVICE LTD
1599 Ocean Avenue
Bohemia, NY 11716
6315676545
NYD987023371

Shipping Name and Description	NumCont	ContType	Quantity	Units	Profile ID
WATER CONTAMINATED W/ GASOLINE OR OIL	1	TT	3705	G	N018

Additional Descriptions for Materials Listed Above

Handling Codes Listed Above

S14

Special Handling Instructions and Additional Information

24 Hour Emergency # (631) 567 - 6545
ERG# 128

Generator's Certification: I certify the materials described above are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed / Typed Name X Matt Boeckel Signature X [signature] Date 4-11-6

Transporter 1 Acknowledgement of Receipt of Materials

Printed / Typed Name Dave Schoonbeam Signature [signature] Date 4-11-6

Transporter 2 Acknowledgement of Receipt of Materials

Printed / Typed Name _____ Signature _____ Date _____

Discrepancy Indication Space

Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted above.

Printed / Typed Name Jennifer Cohoran Signature Jennifer Cohoran Date 4/12/6

White = Original Yellow = Transporter Pink = TSDF Gold = Generator Copy

CBC
Delivery Report - DR & Approval# 5/30/06 T

From: 5/22/06
To: 5/26/06
Approval# 260668
Generator MR YOKOV MORDECHAI
Origin 1357 FLATBUSH AVENUE
BROOKLYN, NY 11210

#Loads 4
TOTAL 114.85

Date	Ticket#	Approval #	Truck#	Loc.	Manifest#s.	Net Tons
5/25/06	6789	260668	JFV 27	A4		29.93
5/25/06	6798	260668	MCB 1	A4	10417	32.48
5/25/06	6850	260668	MCB 1	A4	10415	24.80
5/25/06	6851	260668	JFV 27	A4		27.64

Log Number

ALLIED ENVIRONMENTAL GROUP, INC.

[illegible] MERRICK AVE., MERRICK, NY 11566 • TEL: 1-800-969-DIRT • FAX: 516-867-6480

NON-HAZARDOUS MATERIAL MANIFEST

GENERATOR

Generator Name: YAKOV MORDECHAI
Address: 1357 FLATBUSH AVENUE
BROOKLYN, NY
Phone No.:

Shipping Location: SAME
Address:
Phone No.:

Approval Number	Description of Material	Codes	Gross Weight	Tare Weight	Net Weight	Net Weight (Tons)
260668	NON HAZARDOUS PETROL CONTAMINATED SOIL DESTINED FOR RECYCLING					

I hereby certify that the above named material does not contain free liquid as defined by 40 CFR Part 260.10 or any applicable state law, is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, is not a DOT hazardous substance as defined by 49 CFR Part 172 or any applicable state law, has been fully and accurately described above, classified, packaged and is in proper condition for transportation according to applicable regulations.

Generator Authorized Agent Name: Matt Boeckel
Signature:
Shipment Date: 5-25-06

TRANSPORTER

Transporter Name: TSO
Address: 190 POMPTON PLAINS Rd
Wayne NJ 07470
State Permit #: NJ561

Driver Name (Print): Jorge F. Villarroel
Vehicle License No./State: 290548 3
Truck Number: JFV #27

I hereby certify that the above named material was picked up at the generator site listed above.

Driver Signature:
Shipment Date: 5.25.06

I hereby certify that the above named material was delivered without incident to the destination listed below.

Driver Signature:
Delivery Date: 5.25.06

DESTINATION

Site Name: CLEAN EARTH OF CARTERET
Address: 24 MIDDLESEX AVENUE
CARTERET, NJ

Phone No.: 1201-96
State Permit #: 0001-2

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

Name of Authorized Agent: Matt Boeckel
Signature:
Receipt Date: 5-25-06

5/25/06

CLEAN EARTH OF CARTERET, INC
24 Middlesex Avenue

CLEAN EARTH OF CARTERET, INC
24 Middlesex Avenue
Carteret, NJ 07008
(732)-541-8909
INCOMING LOAD TICKET

Date 5/25/06
Time 4:10 PM
Ticket# 6798

Approval # 260668

Type of Material	Gross	Tare	Net Tons	#Drums
GASOLINE	90,560	25,600	32.48	

WM ID# 3 TOM DURANTE
Bill of Lading#
Manifest# 10417
St. Manifest#

Signature _____

Trans. ID# 143
Transporter TOP SOIL DEPOT INC.
Trans. Addr. 190 POMPTON PLAINS CROSSROADS
WAYNE, NJ 07470

DE-SW Permit#

Driver MARCO Truck # MCB 1

Customer ALLIED ENVIRONMENTAL GROUP, INC
Generator MR YOKOV MORDECHAI
Generator Site 1357 FLATBUSH AVENUE
BROOKLYN, NY 11210

Contact 1 STU BERRY 800-969-DIRT
Contact 2 ALLAN PARKER

NOTES 1:
NOTES 2:

THANK YOU

The TOP SOIL DEPOT
BULK MATERIAL HANDLERS
973-835-9434
Retail/Wholesale

190 POMPTON PLAINS CROSS ROAD, WAYNE, NEW JERSEY 07470
Fax: 973-835-3928 • www.topsoildepot.com
** A New Jersey Corporation **

Log Number 10417

NON-HAZARDOUS MATERIAL MANIFEST

GENERATOR

Generator Name [illegible] Shipping Location

Address [illegible] Address

Phone No. Phone No.

Approval Number 260660

Description of Material

Codes

Gross Weight

Tare Weight

Net Weight

Net Weight (Tons)

I hereby certify that the above named material does not contain free liquid as defined by 40 CFR Part 260.10 or any applicable state law, is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, is not a DOT hazardous substance as defined by 49 CFR Part 172 or any applicable state law, has been fully and accurately described above, classified, packaged and is in proper condition for transportation according to applicable regulations.

Generator Authorized Agent Name Signature Shipment Date

TRANSPORTER

Transporter Name T.S.D.

Address 190 Pompton Plains Cross Road
Wayne, N.J. 07470

State Permit # NJ561

Driver Name (Print)

Vehicle License No./State

Truck Number

I hereby certify that the above named material was picked up at the generator site listed above.

5

Driver Signature Shipment Date

I hereby certify that the above named material was delivered without incident to the destination listed below.

5

Driver Signature Delivery Date

DESTINATION

Site Name Phone No.

Address State Permit #

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

Name of Authorized Agent Signature Receipt Date

OFFICE

CLEAN EARTH OF CARTERET, INC
24 Middlesex Avenue
Carteret, NJ 07008
(732)-541-8909
INCOMING LOAD TICKET

Date 5/25/06
Time 7:30 AM
Ticket# 6850

Approval # 260668

Type of Material	Gross	Tare	Net Tons	#Drums
GASOLINE	75,200	25,600	24.80	

Signature _____

WM ID# 3 TOM DURANTE
Bill of Lading#
Manifest# 10415
St. Manifest#

Trans. ID# 143
Transporter TOP SOIL DEPOT INC.
Trans. Addr. 190 POMPTON PLAINS CROSSROADS
WAYNE, NJ 07470

DE-SW Permit#

Driver MARCO Truck # MCB 1

Customer ALLIED ENVIRONMENTAL GROUP, INC
Generator MR YOKOV MORDECHAI
Generator Site 1357 FLATBUSH AVENUE
BROOKLYN, NY 11210

Contact 1 STU BERRY 800-969-DIRT
Contact 2 ALLAN PARKER

NOTES 1:
NOTES 2:

THANK YOU

The TOP SOIL DEPOT
BULK MATERIAL HANDLERS
973-835-9434
Retail/Wholesale

190 POMPTON PLAINS CROSS ROAD, WAYNE, NEW JERSEY 07470
Fax: 973-835-3928 • www.topsoildepot.com
** A New Jersey Corporation **

Log Number 19415

NON-HAZARDOUS MATERIAL MANIFEST

GENERATOR

Generator Name _____ Shipping Location _____

Address _____ Address _____

NJ

Phone No. _____ Phone No. _____

Approval Number	Description of Material	Codes	Gross Weight	Tare Weight	Net Weight	Net Weight (Tons)
2661661						

I hereby certify that the above named material does not contain free liquid as defined by 40 CFR Part 260.10 or any applicable state law, is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, is not a DOT hazardous substance as defined by 49 CFR Part 172 or any applicable state law, has been fully and accurately described above, classified, packaged and is in proper condition for transportation according to applicable regulations.

MATT BECKER 5.25.06

Generator Authorized Agent Name Signature Shipment Date

TRANSPORTER

Transporter Name T.S.D. Driver Name (Print) _____

Address 190 Pompton Plains Cross Road Vehicle License No./State _____

Wayne, N.J. 07470 Truck Number _____

State Permit # NJ561

I hereby certify that the above named material was picked up at the generator site listed above.

I hereby certify that the above named material was delivered without incident to the destination listed below.

Driver Signature Shipment Date Driver Signature Delivery Date

DESTINATION

Site Name _____ Phone No. _____

Address _____ State Permit # _____

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

Name of Authorized Agent Signature Receipt Date

OFFICE

CLEAN EARTH OF CARTERET, INC

24 Middlesex Avenue
Carteret, NJ 07008
(732)-541-8909

INCOMING LOAD TICKET

Date 5/25/06
Time 7:30 AM
Ticket# 6851

Approval # 260668

Type of Material	Gross	Tare	Net Tons	#Drums
GASOLINE	84,840	29,560	27.64	

WM ID# 3 TOM DURANTE

Signature

Bill of Lading#
Manifest#
St. Manifest#

Trans. ID# 143
Transporter TOP SOIL DEPOT INC.
Trans. Addr. 190 POMPTON PLAINS CROSSROADS
WAYNE, NJ 07470

DE-SW Permit#

Driver JORGE Truck # JFV 27

Customer ALLIED ENVIRONMENTAL GROUP, INC
Generator MR YOKOV MORDECHAI
Generator Site 1357 FLATBUSH AVENUE
BROOKLYN, NY 11210

Contact 1 STU BERRY 800-969-DIRT
Contact 2 ALLAN PARKER

NOTES 1:

NOTES 2:

THANK YOU

ALLIED ENVIRONMENTAL GROUP, INC.

2163 MERRICK AVE., MERRICK, NY 11566 • TEL: 1-800-969-DIRT • FAX: 516-867-6480

Log Number

NON-HAZARDOUS MATERIAL MANIFEST

GENERATOR

Generator Name YAKOV MORDECHAI Shipping Location SAME

Address 1357 Flatbush Ave Address

BROOKLYN, NY

Phone No. Phone No.

Approval Number	Description of Material	Codes	Gross Weight	Net Weight (Tons)
260666	NON HAZARDOUS Petrol CONTAMINATED Soil DESTINED FOR Recycling		Tare Weight	
			Net Weight	

I hereby certify that the above named material does not contain free liquid as defined by 40 CFR Part 260.10 or any applicable state law, is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, is not a DOT hazardous substance as defined by 49 CFR Part 172 or any applicable state law, has been fully and accurately described above, classified, packaged and is in proper condition for transportation according to applicable regulations.

Matt [illegible] [signature] 5.25.06

Generator Authorized Agent Name Signature Shipment Date

TRANSPORTER

Transporter Name TSD

Address 190 Pompton Plains Rd

Wayne NJ 07470

State Permit #

Driver Name (Print) Jorge F. Villarroel

Vehicle License No./State 3905483

Truck Number JFV #27

I hereby certify that the above named material was picked up at the generator site listed above.

[signature] 5.25.06

Driver Signature Shipment Date

I hereby certify that the above named material was delivered without incident to the destination listed below.

[signature] 5.25.06

Driver Signature Delivery Date

DESTINATION

Site Name Clean Earth of Carteret Phone No.

Address State Permit #

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

Name of Authorized Agent Signature [signature] 5/25/06 Receipt Date

ALLIED

CLEAN EARTH OF CARTERET, INC
24 Middlesex Avenue
Carteret, NJ 07008
(732)-541-8909
INCOMING LOAD TICKET

Date 5/25/06
Time 4:06 PM
Ticket# 6789

Approval # 260668

Type of Material	Gross	Tare	Net Tons	#Drums
GASOLINE	89,420	29,560	29.93	

WM ID# 3 TOM DURANTE
Bill of Lading#
Manifest#
St. Manifest#

Signature

Trans. ID# 143
Transporter TOP SOIL DEPOT INC.
Trans. Addr. 190 POMPTON PLAINS CROSSROADS
WAYNE, NJ 07470

DE-SW Permit#

Driver JORGE
Truck # JFV 27

Customer ALLIED ENVIRONMENTAL GROUP, INC
Generator MR YOKOV MORDECHAI
Generator Site 1357 FLATBUSH AVENUE
BROOKLYN, NY 11210

Contact 1 STU BERRY
Contact 2 ALLAN PARKER
800-969-DIRT

NOTES 1:
NOTES 2:

THANK YOU

Laboratory Report and Chain of Custody

Client: Associated Environmental	Client ID: Flatbush Avenue (West Wall)
Date received: 4/21/06	Laboratory ID: 1107356
Date extracted: 4/21/06	Matrix: Soil
Date analyzed: 4/21/06	ELAP #: 11693

EPA METHOD 8021 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
MTBE	1634-04-4	5 ug/kg	<5
Benzene	71-43-2	5 ug/kg	<5
n-Butylbenzene	104-51-8	5 ug/kg	<5
sec-Butylbenzene	135-98-7	5 ug/kg	<5
tert-Butylbenzene	98-06-8	5 ug/kg	<5
Isopropylbezene	98-82-8	5 ug/kg	<5
p-Isopropyltoluene	99-87-6	5 ug/kg	<5
n-Propylbenzene	103-65-1	5 ug/kg	<5
Ethylbenzene	100-41-4	5 ug/kg	<5
Naphthalene	91-20-3	5 ug/kg	<5
Toluene	108-88-3	5 ug/kg	<5
1,2,4-Trimethylbenzene	95-63-6	5 ug/kg	<5
1,3,5-Trimethylbenzene	108-67-8	5 ug/kg	<5
p & m-Xylene	1330-20-7	10 ug/kg	<10
o-Xylene	1330-20-7	5 ug/kg	<5

MDL = Minimum Detection Limit. Calculated on a wet weight basis

Michael Veraldi-Laboratory Director

LONG ISLAND ANALYTICAL LABORATORIES INC.
"TOMORROWS ANALYTICAL SOLUTIONS TODAY"
110 Colin Drive • Holbrook, New York 11741
Phone (631) 472-3400 • Fax (631) 472-8505 • Email: LIAL@lialinc.com

Client: Associated Environmental	Client ID: Flatbush Avenue (West Wall)
Date received: 4/21/06	Laboratory ID: 1107356
Date extracted: 4/24/06	Matrix: Soil
Date analyzed: 4/24/06	ELAP #: 11693

EPA METHOD 8270 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
Naphthalene	91-20-3	40 ug/kg	<40
Anthracene	120-12-7	40 ug/kg	115
Fluorene	86-73-7	40 ug/kg	<40
Phenanthrene	85-01-8	40 ug/kg	660
Pyrene	129-00-0	40 ug/kg	1,397
Acenaphthene	83-32-9	40 ug/kg	<40
Benzo(a)Anthracene	56-55-3	40 ug/kg	563
Fluoranthene	206-44-0	40 ug/kg	1,853
Benzo(b)Fluoranthene	205-99-2	40 ug/kg	822
Benzo(k)fluoranthene	207-08-9	40 ug/kg	315
Chrysene	218-01-9	40 ug/kg	597
Benzo(a)Pyrene	50-32-8	40 ug/kg	466
Benzo(g,h,i)Perylene	191-24-2	40 ug/kg	508
Indeno(1,2,3-cd)Pyrene	193-39-5	40 ug/kg	369
Dibenzo(a,h)Anthracene	53-70-3	40 ug/kg	112

MDL = Minimum Detection Limit. Calculated on a wet weight basis

Michael Veraldi-Laboratory Director

LONG ISLAND ANALYTICAL LABORATORIES INC.
"TOMORROWS ANALYTICAL SOLUTIONS TODAY"
110 Colin Drive • Holbrook, New York 11741
Phone (631) 472-3400 • Fax (631) 472-8505 • Email: LIAL@lialinc.com

Client: Associated Environmental	Client ID: Flatbush Avenue (East Wall)
Date received: 4/21/06	Laboratory ID: 1107357
Date extracted: 4/21/06	Matrix: Soil
Date analyzed: 4/21/06	ELAP #: 11693

EPA METHOD 8021 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
MTBE	1634-04-4	5 ug/kg	<5
Benzene	71-43-2	5 ug/kg	<5
n-Butylbenzene	104-51-8	5 ug/kg	<5
sec-Butylbenzene	135-98-7	5 ug/kg	<5
tert-Butylbenzene	98-06-8	5 ug/kg	<5
Isopropylbezene	98-82-8	5 ug/kg	<5
p-Isopropyltoluene	99-87-6	5 ug/kg	<5
n-Propylbenzene	103-65-1	5 ug/kg	<5
Ethylbenzene	100-41-4	5 ug/kg	<5
Naphthalene	91-20-3	5 ug/kg	<5
Toluene	108-88-3	5 ug/kg	<5
1,2,4-Trimethylbenzene	95-63-6	5 ug/kg	<5
1,3,5-Trimethylbenzene	108-67-8	5 ug/kg	<5
p & m-Xylene	1330-20-7	10 ug/kg	<10
o-Xylene	1330-20-7	5 ug/kg	<5

MDL = Minimum Detection Limit.

Calculated on a wet weight basis

Michael Veraldi-Laboratory Director

LONG ISLAND ANALYTICAL LABORATORIES INC.
"TOMORROWS ANALYTICAL SOLUTIONS TODAY"
110 Colin Drive • Holbrook, New York 11741
Phone (631) 472-3400 • Fax (631) 472-8505 • Email: LIAL@lialinc.com

Client: Associated Environmental	Client ID: Flatbush Avenue (East Wall)
Date received: 4/21/06	Laboratory ID: 1107357
Date extracted: 4/24/06	Matrix: Soil
Date analyzed: 4/24/06	ELAP #: 11693

EPA METHOD 8270 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
Naphthalene	91-20-3	40 ug/kg	<40
Anthracene	120-12-7	40 ug/kg	<40
Fluorene	86-73-7	40 ug/kg	<40
Phenanthrene	85-01-8	40 ug/kg	<40
Pyrene	129-00-0	40 ug/kg	<40
Acenaphthene	83-32-9	40 ug/kg	<40
Benzo(a)Anthracene	56-55-3	40 ug/kg	<40
Fluoranthene	206-44-0	40 ug/kg	<40
Benzo(b)Fluoranthene	205-99-2	40 ug/kg	<40
Benzo(k)fluoranthene	207-08-9	40 ug/kg	<40
Chrysene	218-01-9	40 ug/kg	<40
Benzo(a)Pyrene	50-32-8	40 ug/kg	<40
Benzo(g,h,i)Perylene	191-24-2	40 ug/kg	<40
Indeno(1,2,3-cd)Pyrene	193-39-5	40 ug/kg	<40
Dibenzo(a,h)Anthracene	53-70-3	40 ug/kg	<40

MDL = Minimum Detection Limit.

Calculated on a wet weight basis

Michael Veraldi

Michael Veraldi-Laboratory Director

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Client: Associated Environmental	Client ID: Flatbush Avenue (North-East Wall)
Date received: 4/21/06	Laboratory ID: 1107358
Date extracted: 4/21/06	Matrix: Soil
Date analyzed: 4/21/06	ELAP #: 11693

EPA METHOD 8021 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
MTBE	1634-04-4	5 ug/kg	<5
Benzene	71-43-2	5 ug/kg	<5
n-Butylbenzene	104-51-8	5 ug/kg	<5
sec-Butylbenzene	135-98-7	5 ug/kg	<5
tert-Butylbenzene	98-06-8	5 ug/kg	<5
Isopropylbezene	98-82-8	5 ug/kg	<5
p-Isopropyltoluene	99-87-6	5 ug/kg	<5
n-Propylbenzene	103-65-1	5 ug/kg	<5
Ethylbenzene	100-41-4	5 ug/kg	<5
Naphthalene	91-20-3	5 ug/kg	<5
Toluene	108-88-3	5 ug/kg	<5
1,2,4-Trimethylbenzene	95-63-6	5 ug/kg	<5
1,3,5-Trimethylbenzene	108-67-8	5 ug/kg	64
p & m-Xylene	1330-20-7	10 ug/kg	<10
o-Xylene	1330-20-7	5 ug/kg	67

MDL = Minimum Detection Limit. Calculated on a wet weight basis

Michael Veraldi-Laboratory Director

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Client: Associated Environmental	Client ID: Flatbush Avenue (North-East Wall)
Date received: 4/21/06	Laboratory ID: 1107358
Date extracted: 4/25/06	Matrix: Soil
Date analyzed: 4/25/06	ELAP #: 11693

EPA METHOD 8270 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
Naphthalene	91-20-3	40 ug/kg	494
Anthracene	120-12-7	40 ug/kg	1,122
Fluorene	86-73-7	40 ug/kg	457
Phenanthrene	85-01-8	40 ug/kg	7,051
Pyrene	129-00-0	40 ug/kg	9,245
Acenaphthene	83-32-9	40 ug/kg	671
Benzo(a)Anthracene	56-55-3	40 ug/kg	3,078
Fluoranthene	206-44-0	40 ug/kg	11,523
Benzo(b)Fluoranthene	205-99-2	40 ug/kg	4,171
Benzo(k)fluoranthene	207-08-9	40 ug/kg	1,160
Chrysene	218-01-9	40 ug/kg	3,814
Benzo(a)Pyrene	50-32-8	40 ug/kg	2,474
Benzo(g,h,i)Perylene	191-24-2	40 ug/kg	2,083
Indeno(1,2,3-cd)Pyrene	193-39-5	40 ug/kg	1,612
Dibenzo(a,h)Anthracene	53-70-3	40 ug/kg	449

MDL = Minimum Detection Limit.

Calculated on a wet weight basis

Michael Veraldi

Michael Veraldi-Laboratory Director

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Client: Associated Environmental	Client ID: Flatbush Avenue (North-West Wall)
Date received: 4/21/06	Laboratory ID: 1107359
Date extracted: 4/21/06	Matrix: Soil
Date analyzed: 4/21/06	ELAP #: 11693

EPA METHOD 8021 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
MTBE	1634-04-4	5 ug/kg	<5
Benzene	71-43-2	5 ug/kg	<5
n-Butylbenzene	104-51-8	5 ug/kg	<5
sec-Butylbenzene	135-98-7	5 ug/kg	<5
tert-Butylbenzene	98-06-8	5 ug/kg	<5
Isopropylbezene	98-82-8	5 ug/kg	5
p-Isopropyltoluene	99-87-6	5 ug/kg	<5
n-Propylbenzene	103-65-1	5 ug/kg	7
Ethylbenzene	100-41-4	5 ug/kg	13
Naphthalene	91-20-3	5 ug/kg	10
Toluene	108-88-3	5 ug/kg	63
1,2,4-Trimethylbenzene	95-63-6	5 ug/kg	108
1,3,5-Trimethylbenzene	108-67-8	5 ug/kg	57
p & m-Xylene	1330-20-7	10 ug/kg	183
o-Xylene	1330-20-7	5 ug/kg	127

MDL = Minimum Detection Limit. Calculated on a wet weight basis

Michael Veraldi

Michael Veraldi-Laboratory Director

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Client: Associated Environmental	Client ID: Flatbush Avenue (North-West Wall)
Date received: 4/21/06	Laboratory ID: 1107359
Date extracted: 4/24/06	Matrix: Soil
Date analyzed: 4/24/06	ELAP #: 11693

EPA METHOD 8270 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
Naphthalene	91-20-3	40 ug/kg	53
Anthracene	120-12-7	40 ug/kg	171
Fluorene	86-73-7	40 ug/kg	50
Phenanthrene	85-01-8	40 ug/kg	780
Pyrene	129-00-0	40 ug/kg	798
Acenaphthene	83-32-9	40 ug/kg	69
Benzo(a)Anthracene	56-55-3	40 ug/kg	374
Fluoranthene	206-44-0	40 ug/kg	1,035
Benzo(b)Fluoranthene	205-99-2	40 ug/kg	882
Benzo(k)fluoranthene	207-08-9	40 ug/kg	239
Chrysene	218-01-9	40 ug/kg	721
Benzo(a)Pyrene	50-32-8	40 ug/kg	526
Benzo(g,h,i)Perylene	191-24-2	40 ug/kg	445
Indeno(1,2,3-cd)Pyrene	193-39-5	40 ug/kg	343
Dibenzo(a,h)Anthracene	53-70-3	40 ug/kg	57

MDL = Minimum Detection Limit.

Calculated on a wet weight basis

Michael Veraldi

Michael Veraldi-Laboratory Director

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Client: Associated Environmental	Client ID: Flatbush Avenue (South-East Wall)
Date received: 4/21/06	Laboratory ID: 1107360
Date extracted: 4/21/06	Matrix: Soil
Date analyzed: 4/21/06	ELAP #: 11693

EPA METHOD 8021 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
MTBE	1634-04-4	5 ug/kg	<5
Benzene	71-43-2	5 ug/kg	<5
n-Butylbenzene	104-51-8	5 ug/kg	11
sec-Butylbenzene	135-98-7	5 ug/kg	<5
tert-Butylbenzene	98-06-8	5 ug/kg	<5
Isopropylbezene	98-82-8	5 ug/kg	<5
p-Isopropyltoluene	99-87-6	5 ug/kg	<5
n-Propylbenzene	103-65-1	5 ug/kg	<5
Ethylbenzene	100-41-4	5 ug/kg	<5
Naphthalene	91-20-3	5 ug/kg	<5
Toluene	108-88-3	5 ug/kg	<5
1,2,4-Trimethylbenzene	95-63-6	5 ug/kg	<5
1,3,5-Trimethylbenzene	108-67-8	5 ug/kg	49
p & m-Xylene	1330-20-7	10 ug/kg	<10
o-Xylene	1330-20-7	5 ug/kg	34

MDL = Minimum Detection Limit. Calculated on a wet weight basis

Michael Veraldi-Laboratory Director

Client: Associated Environmental	Client ID: Flatbush Avenue (South-East Wall)
Date received: 4/21/06	Laboratory ID: 1107360
Date extracted: 4/24/06	Matrix: Soil
Date analyzed: 4/24/06	ELAP #: 11693

EPA METHOD 8270 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
Naphthalene	91-20-3	40 ug/kg	303
Anthracene	120-12-7	40 ug/kg	140
Fluorene	86-73-7	40 ug/kg	143
Phenanthrene	85-01-8	40 ug/kg	580
Pyrene	129-00-0	40 ug/kg	2,549
Acenaphthene	83-32-9	40 ug/kg	79
Benzo(a)Anthracene	56-55-3	40 ug/kg	1,464
Fluoranthene	206-44-0	40 ug/kg	2,037
Benzo(b)Fluoranthene	205-99-2	40 ug/kg	420
Benzo(k)fluoranthene	207-08-9	40 ug/kg	276
Chrysene	218-01-9	40 ug/kg	481
Benzo(a)Pyrene	50-32-8	40 ug/kg	421
Benzo(g,h,i)Perylene	191-24-2	40 ug/kg	365
Indeno(1,2,3-cd)Pyrene	193-39-5	40 ug/kg	191
Dibenzo(a,h)Anthracene	53-70-3	40 ug/kg	<40

MDL = Minimum Detection Limit.

Calculated on a wet weight basis

Michael Veraldi-Laboratory Director

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Client: Associated Environmental	Client ID: Flatbush Avenue (South-West Wall)
Date received: 4/21/06	Laboratory ID: 1107361
Date extracted: 4/21/06	Matrix: Soil
Date analyzed: 4/21/06	ELAP #: 11693

EPA METHOD 8021 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
MTBE	1634-04-4	5 ug/kg	<5
Benzene	71-43-2	5 ug/kg	<5
n-Butylbenzene	104-51-8	5 ug/kg	<5
sec-Butylbenzene	135-98-7	5 ug/kg	<5
tert-Butylbenzene	98-06-8	5 ug/kg	<5
Isopropylbezene	98-82-8	5 ug/kg	<5
p-Isopropyltoluene	99-87-6	5 ug/kg	<5
n-Propylbenzene	103-65-1	5 ug/kg	<5
Ethylbenzene	100-41-4	5 ug/kg	<5
Naphthalene	91-20-3	5 ug/kg	<5
Toluene	108-88-3	5 ug/kg	<5
1,2,4-Trimethylbenzene	95-63-6	5 ug/kg	<5
1,3,5-Trimethylbenzene	108-67-8	5 ug/kg	7
p & m-Xylene	1330-20-7	10 ug/kg	<10
o-Xylene	1330-20-7	5 ug/kg	<5

MDL = Minimum Detection Limit. Calculated on a wet weight basis

Michael Veraldi

Michael Veraldi-Laboratory Director

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Client: Associated Environmental	Client ID: Flatbush Avenue (South-West Wall)
Date received: 4/21/06	Laboratory ID: 1107361
Date extracted: 4/24/06	Matrix: Soil
Date analyzed: 4/24/06	ELAP #: 11693

EPA METHOD 8270 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
Naphthalene	91-20-3	40 ug/kg	338
Anthracene	120-12-7	40 ug/kg	58
Fluorene	86-73-7	40 ug/kg	73
Phenanthrene	85-01-8	40 ug/kg	292
Pyrene	129-00-0	40 ug/kg	2,112
Acenaphthene	83-32-9	40 ug/kg	43
Benzo(a)Anthracene	56-55-3	40 ug/kg	1,208
Fluoranthene	206-44-0	40 ug/kg	1,399
Benzo(b)Fluoranthene	205-99-2	40 ug/kg	410
Benzo(k)fluoranthene	207-08-9	40 ug/kg	114
Chrysene	218-01-9	40 ug/kg	181
Benzo(a)Pyrene	50-32-8	40 ug/kg	219
Benzo(g,h,i)Perylene	191-24-2	40 ug/kg	230
Indeno(1,2,3-cd)Pyrene	193-39-5	40 ug/kg	135
Dibenzo(a,h)Anthracene	53-70-3	40 ug/kg	<40

MDL = Minimum Detection Limit. Calculated on a wet weight basis

Michael Veraldi-Laboratory Director

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Client: Associated Environmental	Client ID: Flatbush Avenue (Bottom East)
Date received: 4/21/06	Laboratory ID: 1107362
Date extracted: 4/21/06	Matrix: Soil
Date analyzed: 4/21/06	ELAP #: 11693

EPA METHOD 8021 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
MTBE	1634-04-4	5 ug/kg	<5
Benzene	71-43-2	5 ug/kg	<5
n-Butylbenzene	104-51-8	5 ug/kg	<5
sec-Butylbenzene	135-98-7	5 ug/kg	<5
tert-Butylbenzene	98-06-8	5 ug/kg	<5
Isopropylbezene	98-82-8	5 ug/kg	<5
p-Isopropyltoluene	99-87-6	5 ug/kg	<5
n-Propylbenzene	103-65-1	5 ug/kg	<5
Ethylbenzene	100-41-4	5 ug/kg	<5
Naphthalene	91-20-3	5 ug/kg	<5
Toluene	108-88-3	5 ug/kg	<5
1,2,4-Trimethylbenzene	95-63-6	5 ug/kg	<5
1,3,5-Trimethylbenzene	108-67-8	5 ug/kg	<5
p & m-Xylene	1330-20-7	10 ug/kg	<10
o-Xylene	1330-20-7	5 ug/kg	<5

MDL = Minimum Detection Limit. Calculated on a wet weight basis

Michael Veraldi-Laboratory Director

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Client: Associated Environmental	Client ID: Flatbush Avenue (Bottom East)
Date received: 4/21/06	Laboratory ID: 1107362
Date extracted: 4/24/06	Matrix: Soil
Date analyzed: 4/24/06	ELAP #: 11693

EPA METHOD 8270 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
Naphthalene	91-20-3	40 ug/kg	<40
Anthracene	120-12-7	40 ug/kg	<40
Fluorene	86-73-7	40 ug/kg	<40
Phenanthrene	85-01-8	40 ug/kg	<40
Pyrene	129-00-0	40 ug/kg	<40
Acenaphthene	83-32-9	40 ug/kg	<40
Benzo(a)Anthracene	56-55-3	40 ug/kg	<40
Fluoranthene	206-44-0	40 ug/kg	<40
Benzo(b)Fluoranthene	205-99-2	40 ug/kg	<40
Benzo(k)fluoranthene	207-08-9	40 ug/kg	<40
Chrysene	218-01-9	40 ug/kg	<40
Benzo(a)Pyrene	50-32-8	40 ug/kg	<40
Benzo(g,h,i)Perylene	191-24-2	40 ug/kg	<40
Indeno(1,2,3-cd)Pyrene	193-39-5	40 ug/kg	<40
Dibenzo(a,h)Anthracene	53-70-3	40 ug/kg	<40

MDL = Minimum Detection Limit. Calculated on a wet weight basis

Michael Veraldi

Michael Veraldi-Laboratory Director

Client: Associated Environmental	Client ID: Flatbush Avenue (Bottom West)
Date received: 4/21/06	Laboratory ID: 1107363
Date extracted: 4/21/06	Matrix: Soil
Date analyzed: 4/21/06	ELAP #: 11693

EPA METHOD 8021 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
MTBE	1634-04-4	5 ug/kg	<5
Benzene	71-43-2	5 ug/kg	<5
n-Butylbenzene	104-51-8	5 ug/kg	<5
sec-Butylbenzene	135-98-7	5 ug/kg	<5
tert-Butylbenzene	98-06-8	5 ug/kg	<5
Isopropylbezene	98-82-8	5 ug/kg	<5
p-Isopropyltoluene	99-87-6	5 ug/kg	<5
n-Propylbenzene	103-65-1	5 ug/kg	<5
Ethylbenzene	100-41-4	5 ug/kg	<5
Naphthalene	91-20-3	5 ug/kg	31
Toluene	108-88-3	5 ug/kg	<5
1,2,4-Trimethylbenzene	95-63-6	5 ug/kg	40
1,3,5-Trimethylbenzene	108-67-8	5 ug/kg	26
p & m-Xylene	1330-20-7	10 ug/kg	11
o-Xylene	1330-20-7	5 ug/kg	19

MDL = Minimum Detection Limit. Calculated on a wet weight basis

Michael Veraldi-Laboratory Director

Client: Associated Environmental	Client ID: Flatbush Avenue (Bottom West)
Date received: 4/21/06	Laboratory ID: 1107363
Date extracted: 4/24/06	Matrix: Soil
Date analyzed: 4/24/06	ELAP #: 11693

EPA METHOD 8270 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
Naphthalene	91-20-3	40 ug/kg	64
Anthracene	120-12-7	40 ug/kg	53
Fluorene	86-73-7	40 ug/kg	<40
Phenanthrene	85-01-8	40 ug/kg	307
Pyrene	129-00-0	40 ug/kg	530
Acenaphthene	83-32-9	40 ug/kg	<40
Benzo(a)Anthracene	56-55-3	40 ug/kg	226
Fluoranthene	206-44-0	40 ug/kg	641
Benzo(b)Fluoranthene	205-99-2	40 ug/kg	267
Benzo(k)fluoranthene	207-08-9	40 ug/kg	102
Chrysene	218-01-9	40 ug/kg	252
Benzo(a)Pyrene	50-32-8	40 ug/kg	161
Benzo(g,h,i)Perylene	191-24-2	40 ug/kg	176
Indeno(1,2,3-cd)Pyrene	193-39-5	40 ug/kg	132
Dibenzo(a,h)Anthracene	53-70-3	40 ug/kg	52

MDL = Minimum Detection Limit. Calculated on a wet weight basis

Michael Veraldi

Michael Veraldi-Laboratory Director

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CHAIN OF CUSTODY / REQUEST FOR ANALYSIS DOCUMENT

CLIENT NAME/ADDRESS: Associated Environmental Svcs- 25 Central Avenue Hauppauge, N.Y. 11788

CONTACT: Matt Boeckel
PHONE: 631-234-4280
FAX: 631-234-4297

SAMPLER (SIGNATURE) DATE 4/18/08 TIME
SAMPLER NAME (PRINT) Matt Boeckel DATE 4/18/08 TIME

SAMPLE(S) SEALED: YES / NO
CORRECT CONTAINER(S): YES NO

0024329
0024329

PROJECT LOCATION: Flatbush Ave

SAMPLES RECEIVED AT 7 °C

TERMS & CONDITIONS: Accounts are payable in full within thirty days, outstanding balances accrue service charges of 1.5% per month.

ANALYSIS REQUIRED: 5 TAGS 8021 / 5 TAGS 8270

LABORATORY ID # (For Laboratory Use Only)	MATRIX	TYPE	PRES.	PH UNITS	RES. CHLORINE PPM	SAMPLE # - LOCATION	# OF CONTAINERS
1. 1107356	S	G	4°	-	-	West Wall	1
2. 1107357	S	G	4°	-	-	East Wall	1
3. 1107358	S	G	4°	-	-	North-East Wall	1
4. 1107359	S	G	4°	-	-	North-West Wall	1
5. 1107360	S	G	4°	-	-	South-East Wall	1
6. 1107361	S	G	4°	-	-	South-West Wall	1
7. 1107362	S	G	4°	-	-	Bottom-East	1
8. 1107363	S	G	4°	-	-	Bottom-West	1
9.							
10.							
11.							
12.						Flag G	
13.							
14.							

MATRIX: S=SOIL; SL=SLUDGE; L=LIQUID; DW=DRINKING WATER; A=AIR; W=WIPE; PC=PAINT CHIPS; BM= BULK MATERIAL, O=OIL
TYPE: G=GRAB; C=COMPOSITE; SS=SPLIT SPOON
PRES: ICE, HCL, H_2SO_4, NAOH, $NA_2S_3O_3$

TURNAROUND REQUIRED: ☐ NORMAL ☐ STAT
BY / /

COMMENTS / INSTRUCTIONS

RELINQUISHED BY (SIGNATURE)	DATE 4/21/08 TIME 7:00am	PRINTED NAME Matt Boeckel	RECEIVED BY (SIGNATURE)	DATE TIME	PRINTED NAME
RELINQUISHED BY (SIGNATURE)	DATE TIME	PRINTED NAME	RECEIVED BY SAMPLE CUSTODIAN	DATE 4/21/08 TIME 1:35	PRINTED NAME

WHITE - OFFICE / CANARY - LAB / PINK - SAMPLE CUSTODIAN / GOLDENROD - CLIENT

Client: Associated Environmental	Client ID: Flatbush (Bottom {Fuel Oil})
Date received: 6/9/06	Laboratory ID: 1110924
Date extracted: 6/12/06	Matrix: Soil
Date analyzed: 6/12/06	ELAP #: 11693

EPA METHOD 8021 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
MTBE	1634-04-4	5 ug/kg	<5
Benzene	71-43-2	5 ug/kg	<5
n-Butylbenzene	104-51-8	5 ug/kg	<5
sec-Butylbenzene	135-98-7	5 ug/kg	<5
tert-Butylbenzene	98-06-8	5 ug/kg	<5
Isopropylbezene	98-82-8	5 ug/kg	<5
p-Isopropyltoluene	99-87-6	5 ug/kg	<5
n-Propylbenzene	103-65-1	5 ug/kg	<5
Ethylbenzene	100-41-4	5 ug/kg	<5
Naphthalene	91-20-3	5 ug/kg	<5
Toluene	108-88-3	5 ug/kg	<5
1,2,4-Trimethylbenzene	95-63-6	5 ug/kg	<5
1,3,5-Trimethylbenzene	108-67-8	5 ug/kg	<5
p & m-Xylene	1330-20-7	10 ug/kg	<10
o-Xylene	1330-20-7	5 ug/kg	<5

MDL = Minimum Detection Limit. Calculated on a wet weight basis

Michael Veraldi

Michael Veraldi-Laboratory Director

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Client: Associated Environmental	Client ID: Flatbush (Bottom {Fuel Oil})
Date received: 6/9/06	Laboratory ID: 1110924
Date extracted: 6/13/06	Matrix: Soil
Date analyzed: 6/13/06	ELAP #: 11693

EPA METHOD 8270 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
Naphthalene	91-20-3	40 ug/kg	<40
Anthracene	120-12-7	40 ug/kg	<40
Fluorene	86-73-7	40 ug/kg	<40
Phenanthrene	85-01-8	40 ug/kg	<40
Pyrene	129-00-0	40 ug/kg	<40
Acenaphthene	83-32-9	40 ug/kg	<40
Benzo(a)Anthracene	56-55-3	40 ug/kg	<40
Fluoranthene	206-44-0	40 ug/kg	<40
Benzo(b)Fluoranthene	205-99-2	40 ug/kg	<40
Benzo(k)fluoranthene	207-08-9	40 ug/kg	<40
Chrysene	218-01-9	40 ug/kg	<40
Benzo(a)Pyrene	50-32-8	40 ug/kg	<40
Benzo(g,h,i)Perylene	191-24-2	40 ug/kg	<40
Indeno(1,2,3-cd)Pyrene	193-39-5	40 ug/kg	<40
Dibenzo(a,h)Anthracene	53-70-3	40 ug/kg	<40

MDL = Minimum Detection Limit. Calculated on a wet weight basis

Michael Veraldi

Michael Veraldi-Laboratory Director

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"TOMORROWS ANALYTICAL SOLUTIONS TODAY"
110 Colin Drive • Holbrook, New York 11741
Phone (631) 472-3400 • Fax (631) 472-8505 • Email: LIAL@lialinc.com

Client: Associated Environmental	Client ID: Flatbush (North Wall {Fuel Oil})
Date received: 6/9/06	Laboratory ID: 1110925
Date extracted: 6/12/06	Matrix: Soil
Date analyzed: 6/12/06	ELAP #: 11693

EPA METHOD 8021 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
MTBE	1634-04-4	5 ug/kg	<5
Benzene	71-43-2	5 ug/kg	<5
n-Butylbenzene	104-51-8	5 ug/kg	<5
sec-Butylbenzene	135-98-7	5 ug/kg	<5
tert-Butylbenzene	98-06-8	5 ug/kg	<5
Isopropylbezene	98-82-8	5 ug/kg	<5
p-Isopropyltoluene	99-87-6	5 ug/kg	<5
n-Propylbenzene	103-65-1	5 ug/kg	<5
Ethylbenzene	100-41-4	5 ug/kg	<5
Naphthalene	91-20-3	5 ug/kg	<5
Toluene	108-88-3	5 ug/kg	<5
1,2,4-Trimethylbenzene	95-63-6	5 ug/kg	<5
1,3,5-Trimethylbenzene	108-67-8	5 ug/kg	<5
p & m-Xylene	1330-20-7	10 ug/kg	<10
o-Xylene	1330-20-7	5 ug/kg	<5

MDL = Minimum Detection Limit. Calculated on a wet weight basis

Michael Veraldi

Michael Veraldi-Laboratory Director

LONG ISLAND ANALYTICAL LABORATORIES INC.
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Client: Associated Environmental	Client ID: Flatbush (North Wall {Fuel Oil})
Date received: 6/9/06	Laboratory ID: 1110925
Date extracted: 6/13/06	Matrix: Soil
Date analyzed: 6/13/06	ELAP #: 11693

EPA METHOD 8270 (STARS)

Parameter	CAS No.	MDL	Results ug/kg
Naphthalene	91-20-3	40 ug/kg	<40
Anthracene	120-12-7	40 ug/kg	<40
Fluorene	86-73-7	40 ug/kg	<40
Phenanthrene	85-01-8	40 ug/kg	<40
Pyrene	129-00-0	40 ug/kg	<40
Acenaphthene	83-32-9	40 ug/kg	<40
Benzo(a)Anthracene	56-55-3	40 ug/kg	<40
Fluoranthene	206-44-0	40 ug/kg	<40
Benzo(b)Fluoranthene	205-99-2	40 ug/kg	<40
Benzo(k)fluoranthene	207-08-9	40 ug/kg	<40
Chrysene	218-01-9	40 ug/kg	<40
Benzo(a)Pyrene	50-32-8	40 ug/kg	<40
Benzo(g,h,i)Perylene	191-24-2	40 ug/kg	<40
Indeno(1,2,3-cd)Pyrene	193-39-5	40 ug/kg	<40
Dibenzo(a,h)Anthracene	53-70-3	40 ug/kg	<40

MDL = Minimum Detection Limit. Calculated on a wet weight basis

Michael Veraldi

Michael Veraldi-Laboratory Director

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"TOMORROWS ANALYTICAL SOLUTIONS TODAY"

Associated CHAIN OF CUSTODY / REQUEST FOR ANALYSIS DOCUMENT

CLIENT NAME/ADDRESS	CONTACT: Matt Boeckel	SAMPLER (SIGNATURE) / DATE / TIME	SAMPLE(S) SEALED	0025296
AES, Ltd. 25 Central Avenue Hauppauge, N.Y.	PHONE: 631-234-4280 FAX: 631-234-4297	Matt Boeckel 6/5/06 12:00	YES / NO	
PROJECT LOCATION: Flatbush		SAMPLER NAME (PRINT) / DATE / TIME: Matt Boeckel 6/5/06 12:00	CORRECT CONTAINER(S) YES / NO	

SAMPLES RECEIVED AT: 8 °C

TERMS & CONDITIONS: Accounts are payable in full within thirty days, outstanding balances accrue service charges of 1.5% per month.

LABORATORY ID # (For Laboratory Use Only)	MATRIX	TYPE	PRES.	PH UNITS	RES. CHLORINE PPM	SAMPLE # - LOCATION	ANALYSIS REQUIRED: STARS 6021	STARS 6010	# OF CONTAINERS
1. 1110924	S	G	4°	-	-	Bottom (Fuel 0:1)	X	X	2
2. 1110925	S	G	4°	-	-	North Wall (Fuel 0:1)	X	X	2
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.									
13.									
14.									

MATRIX: S=SOIL; SL=SLUDGE; L=LIQUID; DW=DRINKING WATER; A=AIR; W=WIPE; PC=PAINT CHIPS; BM= BULK MATERIAL, O=OIL
TYPE: G=GRAB; C=COMPOSITE; SS=SPLIT SPOON
PRES: ICE, HCL, H_2SO_4, NAOH, $NA_2S_3O_3$

TURNAROUND REQUIRED: ☒ NORMAL ☐ STAT
BY / /

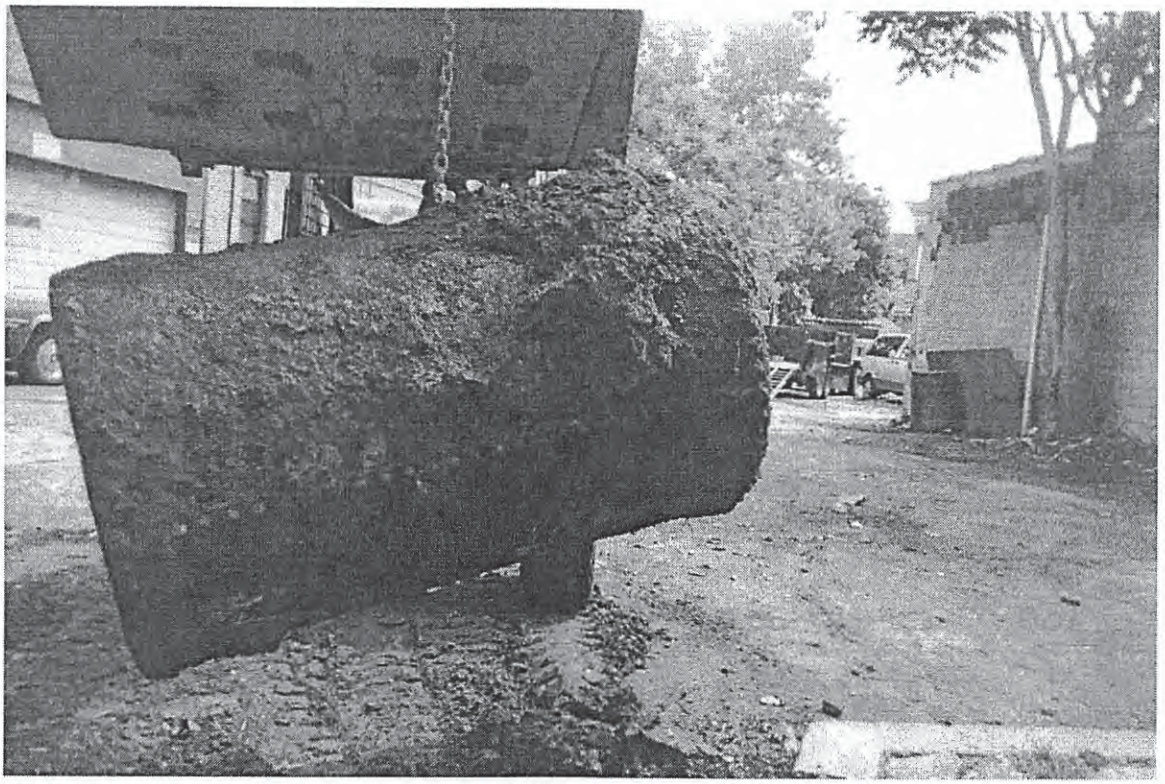
COMMENTS / INSTRUCTIONS

RELINQUISHED BY (SIGNATURE)	DATE / TIME	PRINTED NAME	RECEIVED BY (SIGNATURE)	DATE / TIME	PRINTED NAME
	6/8/06 8:00	Matt Boeckel		6.9.06 10:30	T. Bascelli
RELINQUISHED BY (SIGNATURE)	DATE / TIME	PRINTED NAME	RECEIVED BY SAMPLE CUSTODIAN	DATE / TIME	PRINTED NAME
				6/9/06 11:48A	T. Dwyer

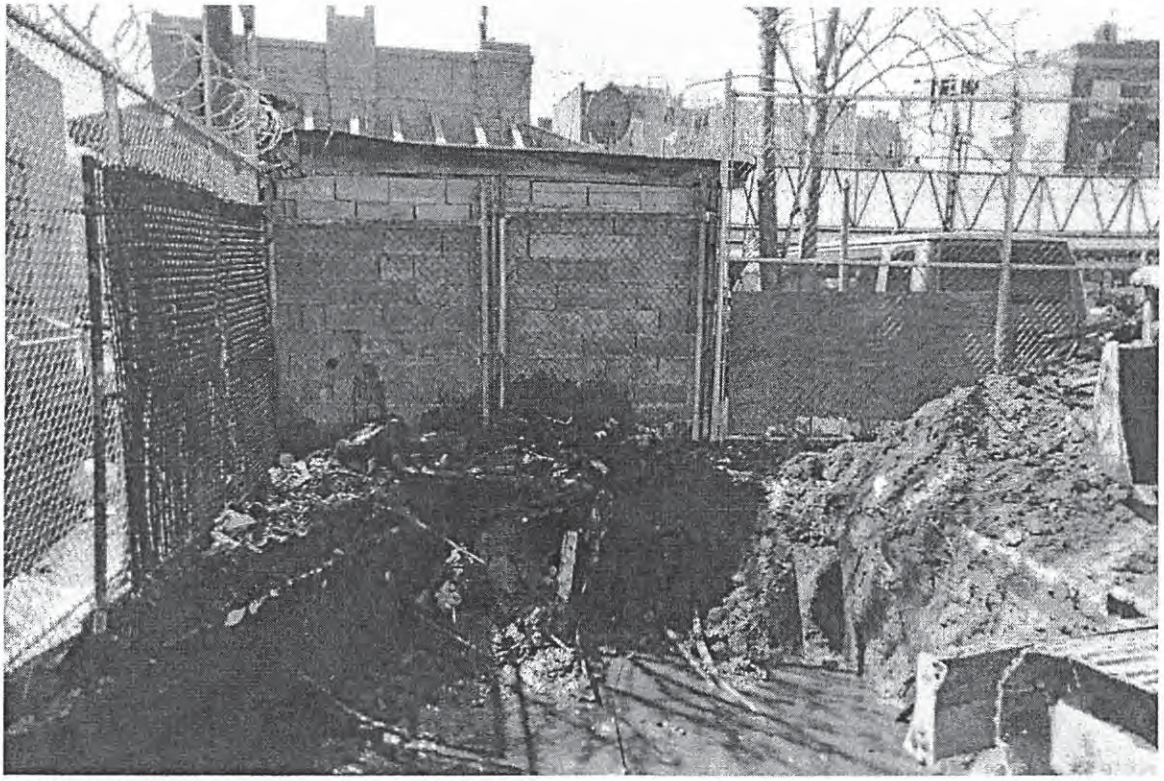
Site Photographs

1. View of the subject site.

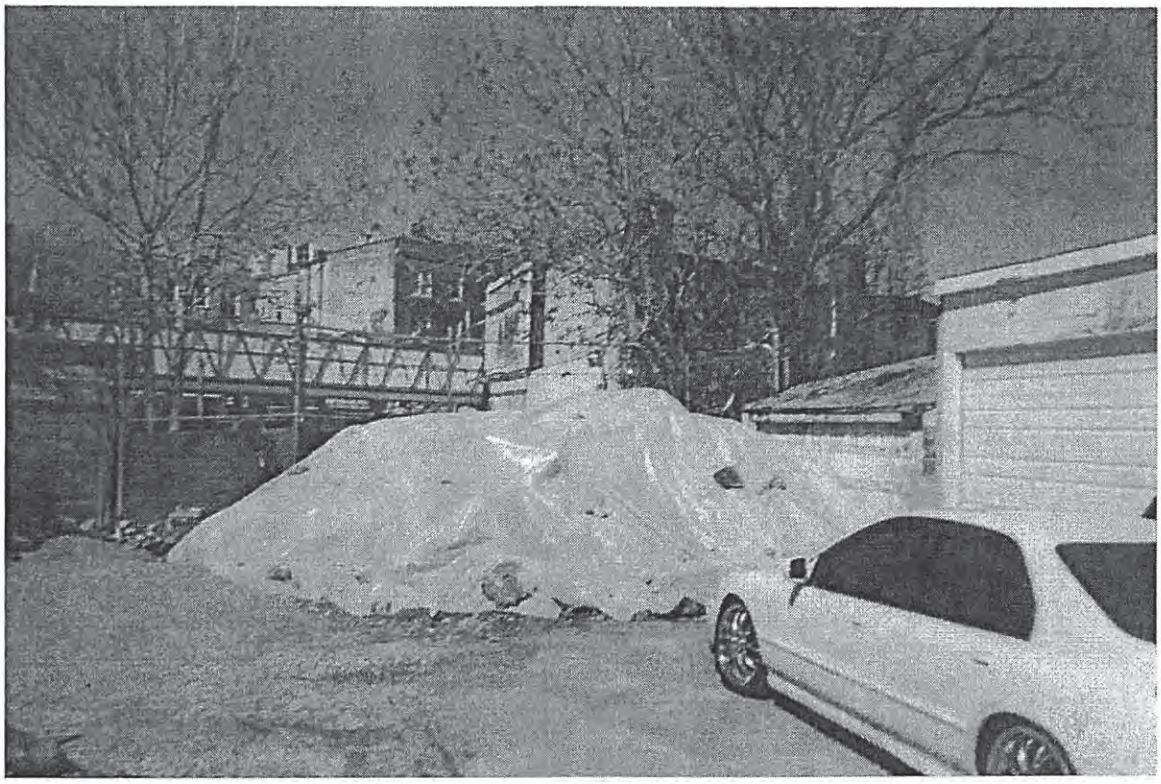
2. View of the gasoline USTs.



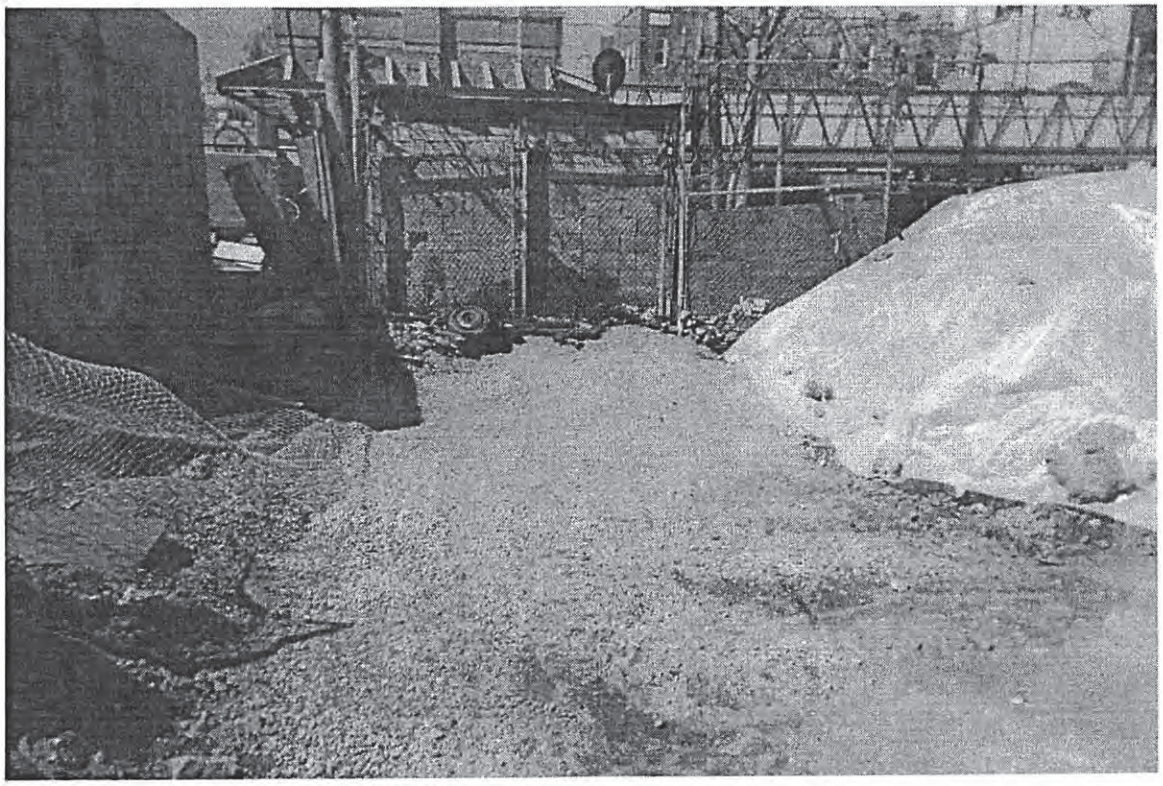
3. View of the fuel oil UST.



4. View of the excavation pit upon removal of the USTs.



5. View of the contaminated soil pile.



6. View of the excavation pit upon backfilling.

NEW YORK STATE
DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

Spill Incidents Database Search Details

Spill Record

Administrative Information

DEC Region: 2
Spill Number: 0600423

Spill Date/Time

Spill Date: 04/11/2006 **Spill Time:** 02:30:00 PM
Call Received Date: 04/11/2006 **Call Received Time:** 03:59:00 PM

Location

Spill Name: 1357 FLATBUSH AVE
Address: 1357 FLATBUSH AVE
City: BROOKLYN **County:** KINGS

Spill Description

Material Spilled	Amount Spilled	Resource Affected
Gasoline	UNKNOWN	Soil

Cause: Tank Overfill
Source: Commercial/Industrial
Waterbody:

Record Close

Date Spill Closed: 04/27/2006

"Date Spill Closed" means the date the spill case was closed by the case manager in the Department of Environmental Conservation (the Department). The spill case was closed because either; a) the records and data submitted indicate that the necessary cleanup and removal actions have been completed and no further remedial activities are necessary, or b) the case was closed for administrative reasons (e.g., multiple reports of a single spill consolidated into a single spill number). The Department however reserves the right to require additional remedial work in relation to the spill, if in the future it determines that further action is necessary.

If you have questions about this reported incident, please contact the Regional Office where the incident occurred.
Refine Current Search

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 2
Spill Prevention and Response Programs
47-40 21ST Street, Long Island City, NY 11101-5407
Phone: (718) 482-7366 • **FAX:** (718) 482-4098 • **Website:** www.dec.state.ny.us

Denise M. Sheehan
Commissioner

FAX

Date: July 10, 2006

Please deliver following pages to:

Name	:	**Shalon Isreali**	**Fax Number** :	**(718) 253-8330**
Company	:			
Name	:	**Matthew Boeckel**	**Fax Number** :	**(631) 234-4297**
Company	:	**Associated Environmental Services, Ltd.**		
Name	:		**Fax Number** :	
Company	:			
Name	:		**Fax Number** :	
Company	:			
Name	:		**Fax Number** :	
Company	:			

From

Name : **Hiralkumar Patel**

Fax Number : **(718) 482-4098**

Total Number of Pages : **2 including this page.**

Remarks : **Spill # 0600423, 0600910**

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 2
Spill Prevention and Response Programs
47-40 21ST Street, Long Island City, NY 11101-5407
Phone: (718) 482-7366 • **FAX:** (718) 482-4098 • **Website:** www.dec.state.ny.us

Denise M. Sheehan
Commissioner

July 10, 2006

Shalon Isreali
Eighteen Investment Group
3032 Nostrand Ave
Brooklyn, NY 11229

Re.: Spill at 1353 Flatbush Ave
Brooklyn, NY
Spill Case #: 0600423 & 0600910

Project Manager: Hiralkumar Patel

Dear Mr. Isreali,

Based on the submitted documentation provided to date, no further investigation or response will be required concerning this site, with regard to the spill number referenced above. The New York State DEC spill cases **0600423** and **0600910** have been inactivated.

The Department hereby reserves all of its rights concerning, and such forbearance shall not extend to, any further investigation or remedial action the Department deems necessary due to:

I. The off-site migration of petroleum contaminants that was not addressed by this evaluation.

II. Environmental conditions related to the Site which were unknown to the Department at the time of this approval.

III. Information received, in whole or part, after the Department's approval for inactivation, which indicates that inactivation decision and/or corrective action is not sufficiently protective of human health for the reasonably anticipated use of the site.

IV. Fraud in obtaining this approval for inactivation.

Please be advised that you should maintain a permanent file of all documentation and correspondence regarding this case for future property transactions, refinancing, etc. The Department's files regarding this release may not be maintained indefinitely.

Sincerely,

Hiralkumar Patel
Environmental Engineer
Spill Prevention & Response Programs

CC: Matthew Boeckel, Associated Environmental Services, Ltd.

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APPENDIX 3

CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Hello Living / Hello Flatbush 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, Hello Living / Hello Flatbush 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, Sarah Pong, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 788-8841.

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

manager. If you would like to be added to the Project Contact List, contact NYC OER at (212) 788-8841 or by email at brownfields@cityhall.nyc.gov.

Repositories. A document repository is maintained in the nearest public library that maintains evening and weekend hours. This document repository is intended to house, for community review, all principal documents generated during the cleanup program including Remedial Investigation plans and reports, Remedial Action work plans and reports, and all public notices and fact sheets produced during the lifetime of the remedial project. Hello Living / Hello Flatbush LLC will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

Brooklyn Public Library – Clarendon Library

2035 Nostrand Avenue

Brooklyn, NY 11210

(718) 421-1159

Monday, Thursday & Friday 10:00am – 6:00pm

Tuesday 1:00pm – 8:00pm

Wednesday 10:00am – 8:00pm

Saturday 10:00am – 5:00pm

Sunday 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. There are no known issues of public concern associated with this project.

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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 Hello Living / Hello Flatbush LLC, reviewed and approved by OER prior to distribution and mailed by Hello Living / Hello Flatbush LLC. Public comment is solicited in public notices for all work plans developed under the NYC Voluntary Cleanup Program. Final review of all work plans by OER will consider all public comments. Approval will not be granted until the public comment period has been completed.

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

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

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

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

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

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- **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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APPENDIX 4

SOIL/MATERIALS MANAGEMENT PLAN

1.1 SOIL SCREENING METHODS

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

1.2 STOCKPILE METHODS

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

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

1.3 CHARACTERIZATION OF EXCAVATED MATERIALS

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

1.4 MATERIALS EXCAVATION, LOAD-OUT AND DEPARTURE

The PE/QEP overseeing the remedial action will:

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

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

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

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1.5 OFF-SITE MATERIALS TRANSPORT

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

Outbound truck transport routes will be provided once the soil disposal facility has been determined. 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 Hello Living / Hello Flatbush, LLC to each disposal facility describing the material to be disposed and requesting written acceptance of the material. This letter will state that material to be disposed is regulated material generated at an environmental remediation Site in Manhattan, New York under a governmental remediation program. The letter will provide the project identity and the name and phone number of the PE/QEP or Hello Living / Hello Flatbush, LLC. 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.

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

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

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

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. '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.

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.

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.

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

1.10 FLUIDS MANAGEMENT

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

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

1.11 STORM-WATER POLLUTION PREVENTION

Applicable laws and regulations pertaining to storm-water pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in this RAWP (silt fences and barriers, and hay bale checks) will be installed around the entire perimeter of the remedial construction area and inspected once a week and after every storm

event to ensure that they are operating appropriately. Discharge locations will be inspected to determine whether erosion control measures are effective in preventing significant impacts to receptors. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. All necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. Undercutting or erosion of the silt fence toe anchor will be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

1.12 CONTINGENCY PLAN

This contingency plan is developed for the remedial construction to address the discovery of unknown structures or contaminated media during excavation. Identification of unknown contamination source areas during invasive Site work will be promptly communicated to OER's Project Manager. Petroleum spills will be reported to the NYS DEC Spill Hotline. These findings will be included in the daily report. If previously unidentified contaminant sources are found during on-Site remedial excavation or development-related excavation, sampling will be performed on contaminated source material and surrounding soils and reported to OER. Chemical analytical testing will be performed for TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

1.13 ODOR, DUST AND NUISANCE CONTROL

Odor Control

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

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

Dust Control

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

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

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

Other Nuisances

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

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

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APPENDIX 5

HEALTH AND SAFETY PLAN

CONSTRUCTION HEALTH & SAFETY PLAN

1353 Flatbush Avenue
E-223; Block 5227, Lots 13, 15 and 16
Brooklyn, New York

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A. Health and Safety Fact Sheets

1.0 INTRODUCTION

This Construction Health & Safety Plan (CHASP) has been prepared by Hydro Tech Environmental, Corp. (Hydro Tech) as a part of the Remedial Action Work Plan (RAWP) for 1353 Flatbush Avenue (Block 5227, Lots 13, 15 and 16) and situated in the borough of Brooklyn, New York.

This CHASP will conform to applicable regulations, safe work practices and the project's requirements, and addresses those activities associated with the development of a 7-story mixed use commercial and residential building with a full cellar. Open landscaped areas are proposed as part of this development in the eastern and northen portions of the property.

The Hydro Tech Project Manager (PM), Site Safety Officer (SSO) and field staff (when necessary) will implement the Plan during construction. Compliance with this HASP is required of all persons and third parties who perform the scope of work documented for this project. Assistance in implementing this CHASP can be obtained from the SSO. The content of this CHASP may change or undergo revisions based upon additional information that is made available to health and safety personnel, monitoring results, or changes in the technical scope of work.

It should be noted that this CHASP does not apply to any other scopes of work that may be performed at the Site that are not specifically outlined in this report. Through preparation of this HASP, Hydro Tech and all Subcontractors (if any) do not guarantee the health or safety of any person entering this Site. Due to the nature of this Site and the activities occurring thereon, it is not possible to discover, evaluate and provide protection for all possible hazards that may be encountered. Only those portions of this CHASP that specifically apply to authorized personnel of Hydro Tech will enact the activities at the Site. Strict adherence to the applicable portions of these health and safety guidelines set forth herein will reduce, but not eliminate the potential for injury at this Site. The health and safety guidelines in this CHASP were prepared specifically for this Site and should not be utilized for any other site without prior research and evaluation by trained health and safety specialists and approval by Hydro Tech.

2.0 SCOPE OF WORK

This Construction HASP has been prepared as a part of the RAWP to be implemented during the upcoming development of the Site.

The portions of the construction activities specifically addressed in this Construction HASP will include the following and will be performed in the following sequence:

- Supervision of the excavation of soil/fill and other material
- Supervision of the installation of concrete foundations
- Supervision of the installation of vapor barrier system
- Supervision of the installation of an active sub-slab depressurization system (SSDS)

Prior to any fieldwork, the New York City One-Call Unit will be contacted so that all public utilities can be marked out. The proposed schedule of fieldwork will be coordinated with the developer and the OER.

3.0 STAFFING

This section briefly describes the personnel involved in Site remedial activities, their contact information and their health and safety responsibilities. This section also provides directions to hospital in the case of a health emergency.

EMERGENCY NUMBERS

Contact	Phone Number
The Brooklyn Hospital Center – Caledonian Campus	718-282-8904
New York City EMS	911
NYPD	911
NYFD	911
National Response Center	(800) 424-8802
Poison Information Center	(800) 562-8816
Chemtree	(800) 424-9555

Project Management/Health and Safety Personnel

Title	Contact	Phone Number	Cell Phone
Project Geologist	AJ Infante	(718) 636-0800	(631) 457-0033
Site Safety Officer	Carlos Quinonez	(631) 462-5866	(631) 828-0234
Project Manager	AJ Infante	(718) 636-0800	(631) 457-0033

Directions To The Brooklyn Hospital Center – Caledonian Campus (See Attached Figure 1)
Upon leaving the Site, head north on Flatbush Avenue. Turn left onto Beverly Road and then right onto Coney Island Avenue. Destination will be on the right.

PROJECT MANAGER

As necessary, the Project Manager will perform the following:

- Has the overall responsibility for the health and safety of site personnel
- Ensures that adequate resources are provided to the field staff to carry out their responsibilities as outlined below.
- Ensures that fieldwork is scheduled with adequate personnel and equipment resources to complete the job in a safe manner.
- Ensures that adequate communication between field crews and emergency response personnel is maintained.
- Ensures that field site personnel are adequately trained and qualified to work at the Site.

SITE SAFETY OFFICER

As necessary, the Site Safety Officer will perform the following:

- Directs and coordinates health and safety monitoring activities.
- Ensures that field teams utilize proper personal protective equipment (PPE).

- Conducts initial on-Site, specific training prior to personnel and/or subcontractors proceeding to work.
- Conducts and documents periodic safety briefings; ensures that field team members comply with this Construction HASP.
- Completes and maintains Accident/Incident Report Forms.
- Notifies corporate administration of all accidents/incidents.
- Determines upgrade or downgrade of PPE based on site conditions and/or downgrade of PPE

based on site conditions and/or real-time monitoring results.
- Ensures that monitoring instruments are calibrated daily or as determined by manufacturer's suggested instructions.
- Maintains health and safety field log books.
- Develops and ensures implementation of the Construction HASP.
- Approves revised or new safety protocols for field operations.
- Coordinates revisions of this Construction HASP with field personnel and the SSO Division Contracting Officer.
- Responsible for the development of new company safety protocols and procedures and resolution of any outstanding safety issues which may arise during the conduction of site work.
- Reviews personnel and subcontractors current and up-to-date medical examination and acceptability of health and safety training.

FIELD PERSONNEL AND SUBCONTRACTORS (IF ANY)

- Reports any unsafe or potentially hazardous conditions to the SSO
- Maintains knowledge of the information, instructions, and emergency response actions contained in this Construction HASP.
- Comply with rules, regulations and procedures as set forth in this Construction HASP and any revisions that are instituted.
- Prevents admittance to work sites by unauthorized personnel.

4.0 CHEMICAL & WASTE DESCRIPTION/CHARACTERIZATION

The following list of compounds is based on the results of previous investigations at similar sites:

Semi Volatile Organic Compounds in soil:

- Benzo (a) Anthracene
- Benzo (a) Pyrene
- Chryzene
- Benzo (b) Fluoranthene
- Benzo (k) Fluoranthene
- Indeno(1,2,3-cd)pyrene

Pesticides in soil:
- 4,4-DDD
- 4,4-DDE
- 4,4-DD

Heavy Metals in soil:

- Arsenic
- Barium
- Cadmium
- Copper
- Lead

- Nickel
- Zinc
- Silver

Volatile Organic Compounds in groundwater:
- Methl-Tert-Buthyl-Ether

Volatile Organic Compounds in soil vapors:
- BTEX and associated petroleum related compounds
- Methylene Chloride
- PCE
- Chloroform
- Acetone

Appendix A contains Material Safety Data Sheets

The following information references are presented in order to identify the properties, characteristics and hazards of the compounds and metals that may/will be encountered at the Site.

* Dangerous Properties of Industrial Materials - Sax
* Chemical Hazards of the Workplace - Proctor/Hughes
* Condensed Chemical Dictionary - Hawley
* Rapid Guide to Hazardous Chemical in the Workplace - Lewis 1990.
* NIOSH Guide to Chemical Hazards – 1990.
* ACGIH TLV Values and Biological Exposure Indices - 1991-1992.

5.0 HAZARD ASSESSMENT AND MITIGATION

The potential hazards associated with planned site activities include chemical, physical and biological hazards associated with the construction. This section discusses those hazards that are anticipated to be encountered during the activities listed in the scope of work.

The potential to encounter chemical hazards is dependent upon the work activity performed (invasive or non-invasive), the duration, and location of the work activity. Such hazards could include inhalation or skin contact with chemicals that could cause: dermatitis, skin burn, being overcome by vapors, or asphyxiation. In addition, the handling of contaminated materials and chemicals could result in fire and/or explosion.

The potential to encounter physical hazards during site work includes: heat stress, exposure to excessive noise, loss of limbs, being crushed, head injuries, cuts and bruises, and other physical hazards due to motor vehicle operation, heavy equipment and power tools.

CHEMICAL HAZARDS
The potential for personnel and subcontractors to come in contact with chemical hazards may occur during the following tasks:

- Excavation
- Installation of vapor barrier
- Pouring of concrete foundation(s)

Exposure Pathways
Exposure to these compounds during ongoing activities may occur through inhalation of contaminated dust particles, inhalation of volatile vapor fume compounds, by way of dermal absorption, and accidental ingestion of the contaminant by either direct or indirect cross contamination activities (eating, smoking, poor hygiene). Indirectly, inhalation of contaminated dust particles can occur during adverse weather conditions (high or changing wind directions) or during operations that may generate airborne dust such as excavation.

Dust Suppression
The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities.

1. Applying water on haul roads.
2. Wetting equipment and excavation faces.
3. Spraying water on buckets during excavation and dumping.
4. Hauling materials in properly sealed or watertight containers.
5. Restricting vehicle speeds to 10mph.
6. Covering excavated areas and material after excavation activity ceases.
7. Reducing the excavation size and/or number of excavations.
8. Applying a dust suppressant, such as calcium chloride, in high vehicle traffic areas.

To evaluate the effectiveness if the dust suppression measures, air monitoring will be performed utilizing real-time dust-monitoring equipment. The requirements for air monitoring during post-remediation soil disturbance activities are presented in Section 5.0.

Additional Precautions
Dermal absorption or skin contact with chemical compounds is possible during invasive activities at the Site, including the excavation and/or capping of soils. The use of PPE in accordance with Section 9.0 and strict adherence to proper decontamination procedures should significantly reduce the risk of skin contact.

The potential for accidental ingestion of potentially hazardous chemicals is expected to be remote, when good hygiene practices are used. Unauthorized personnel, including all children, will not be allowed access to the Site.

PHYSICAL HAZARDS
A variety of physical hazards may be present during Site activities. These hazards are similar to those associated with any construction type project and include digging or boring operations and excavation activities in the vicinity of underground utility locations. These physical hazards are due to motor vehicles, and heavy equipment operation, the use of improper use of power and hand tools, misuse of pressurized cylinders, walking on objects, tripping over objects, working on surfaces which have the potential to promote falling, mishandling and improper storage of solid and hazardous materials, skin burns, crushing of fingers, toes, limbs, hit on the head by falling objects or hit one's head due to not seeing the object of concern, temporary loss of one's hearing and/or eyesight. Theses hazards are not unique and are generally familiarly to most hazardous waste site workers at construction sites. Additional task specific safety requirements will be covered during safety briefings.

6.0 SPILL PREVENTION AND CONTROL PLAN

Accidental spill and leaks of hazardous and non-hazardous materials will be properly controlled so that they do not adversely impact storm drain systems or receiving waters. A spill prevention and control plan will include the following:

Spill/Leak Prevention Measures;
-Place any material under cover (tarp) and away from storm drains or sensitive water bodies
-Properly label all containers so that the contents are easily identifiable
-Berm storage areas so that if a spill or leak occur they are easily contained

Spill Response Procedures
- Assessment of the Site and potential impacts by the SSO
- Containment of the material
- Notification of the personnel present at the Site and ensure evacuation procedure if necessary.

Spill Cleanup Procedures
-If small non-hazardous spill, use cleanup materials such as absorbents or rags and damp cloths and dispose of properly;
-If large non-hazardous spill or hazardous spill, a private hazmat team may need to be contacted to assess the situation and conduct the cleanup and proper disposal of the material.

Reporting
-Petroleum spills will be reported immediately to the NYSDEC Spill Hotline.
-If material is unknown or hazardous, contact the local Fire Department.

Training
-The SSO is responsible for providing refreshment training to all employees working on-site about spill prevention, spill response and cleanup on a routine basis.
-The SSO will identify key spill response personnel to assist in the spill control and cleanup procedures.

7.0 TRAINING

GENERAL HEALTH AND SAFETY TRAINING
In accordance with 29 CFR 1910.120, all construction personnel involved with the portions of the scope of work described in Section 2.0 will be briefed by the Project Manager on the potential hazards and the overall requirements in meeting the specifications of this Construction HASP.

The SSO will have the responsibility of ensuring that personnel assigned to this project comply with these requirements. Written certification of completion of any required training, if necessary, will be provided to the SSO.

MANAGER/SUPERVISOR TRAINING
In accordance with 29 CFR 1910.120, on-Site management and supervisors who will be directly responsible for, or who supervise employees engaged in hazardous waste operation shall receive training as required in this Construction HASP and at least eight (8) additional hours of specialized training on managing such operations at the time of job assignment.

ANNUAL 8-HOUR REFRESHER TRAINING
Annual 8-hour refresher training will be required of all hazardous waste site field personnel in order to maintain their qualification for fieldwork. The following topics will be reviewed:

toxicology, respiratory protection, including air purifying devices and self-contained breathing apparatus (SCBA), medical surveillance, decontamination procedures and personnel protective clothing. In addition, topics deemed necessary by the SSO may be added to the above list.

SITE SPECIFIC TRAINING
Prior to commencement of field activities, all personnel assigned to the project will be provided training that will specifically address the activities, procedures, monitoring, and equipment for the site operations. It will include Site and facility layout, hazards, and emergency services at the Site, and will highlight all provisions contained within this Construction HASP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity.

ON-SITE SAFETY BRIEFINGS
Project personnel and visitors will be given periodic on-site health and safety briefings by the SSO, or their designee, to assist site personnel in safely conducting their work activities. The briefings will include information on new operations to be conducted, changes in work practices, or changes in the Site's environmental conditions. The briefings will also provide a forum to facilitate conformance with safety requirements and to identify performance deficiencies related to safety during daily activities or as a result of safety audits.

ADDITIONAL TRAINING
Additional training may be required by the SSO for participation in certain field tasks during the course of the project. Such additional training could be in the safe operation of heavy or power tool equipment or hazard communication training.

HAZWOPER TRAINING
All remedial personnel that will be in direct contact with the native soil/fill materials must complete an initial 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training course and, where necessary, a current 8-hour refresher course

SUBCONTRACTOR TRAINING
Subcontractor personnel working on-site may be exempted from the contents of this Construction HASP. The SSO will determine if this exemption is allowed. In any case, the subcontractor personnel who are exposed to hazards are not exempted from the contents of this Construction HASP.

8.0 MEDICAL SURVEILLANCE

GENERAL
No general or specific medical surveillance or other medical requirements are set forth in this Construction HASP.

9.0 SITE CONTROL, PPE & COMMUNICATIONS

SITE CONTROL

The area where the activities of the scope of work will be performed is considered to be the Exclusion Zone (EZ). All areas where excavation and handling of contaminated materials take place are considered the EZ. This zone will be clearly delineated by cones, tape, or other means. The SSO may establish more than one EZ where different levels of protection may be employed or where different hazards exist. Personnel are not allowed in the EZ without:

- A buddy
- Appropriate personal protective equipment (as necessary)

The remaining portions of the Site outside of the EZ will consist of a Support Zone (SZ) and a Contamination Reduction Zone (CRZ). Appropriate sanitary facilities, safety equipment, packaged/decontaminated and labeled samples will be located in SZ. Potentially contaminated personnel or materials will be allowed in the CRZ for decontamination as necessary.

PERSONAL PROTECTIVE EQUIPMENT

General

The level of protection worn by field personnel will be enforced by the SSO. Levels of protection may be upgraded or downgraded at the discretion of the SSO. The decision shall be based on real-time air monitoring, site history data, and prior site experience. Any changes in the level of protection shall be recorded in the health and safety field logbook.

PPE Specifications

For tasks requiring Level C PPE, the following equipment shall be used:

- Cotton or disposable coveralls
- Disposable outer coveralls (Poly-coated Tyvek)
- Gloves, inner (latex)
- Gloves, outer (Nitrile®)
- Boots (PVC), steel toe/shank
- Boot covers (as needed)
- Hard Hat
- Hearing protection (as needed)
- Splash suit and face shield for decontamination operations (as needed)

For tasks requiring Level D PPE, the following equipment shall be used:

- Cotton or disposable coveralls
- Gloves, inner (latex)
- Gloves, outer (Nitrile®)
- Boots (PVC) steel toe/shank
- Boot covers (as needed)

- Hard hat
- Hearing protection (as needed)
- Safety glasses

For tasks requiring Level D PPE, the following equipment shall be used:

- Cotton or disposable coveralls
- Gloves, inner (latex)

- Gloves, outer (Nitrile®)
- Boots (PVC) steel toe/shank
- Boot covers (as needed)
- Hard hat
- Hearing protection (as needed)
- Safety glasses

For tasks requiring respiratory protection, the following equipment shall be used:

Level D - No respiratory protective equipment necessary except for a dust mask
Level C - A full-face air-purifying respirator equipped with organic vapor/pesticide-HEPA cartridges
Level B - An air line respirator or a self-contained breathing apparatus (SCBA)

LEVEL OF PERSONAL PROTECTIVE EQUIPMENT REQUIRED

Activity	**Level of Protection Respiratory/PPE**
Excavations	C/D
Foundation Construction	C/D

COMMUNICATIONS
Communications is the ability to talk with others. While working in Level C Protection, personnel may find that communication become a more difficult task and process to accomplish. This is further complicated by distance and space. In order to address this problem, electronic instruments, mechanical devices or hand signals will be used as follows:

- Walkie-Talkies - Hand held radios would be utilized as much as possible by field teams for communication between downrange operations and the Command Post base station.

- Telephones - A mobile telephone will be located in the Command Post vehicle in the Support Zone for communication with emergency support services/facilities. If a telephone is demobilized, the nearest public phones will be identified.

- Air Horns - A member of the downrange field team will carry an air horn and another will be evident in the Support Zone to alert field personnel to an emergency situation.

- Hand Signals - Members of the field team using the buddy system will employ this communication method. Signals become especially important when in the vicinity of heavy moving equipment and when using Level B respiratory equipment. The signals shall become familiar to the entire field team before site operations commence and they will be reinforced and reviewed during site-specific training.

HAND SIGNALS FOR ON-SITE COMMUNICATION

Signal	**Meaning**
Hand gripping throat	Out of air, can't breathe
Grip partners' wrist	Leave area immediately; no debate
Hands on top of head	Need assistance
Thumbs up	OK, I'm all right; I understand
Thumbs down	No; negative, unable to understand you. I'm not all right

10.0 AIR MONITORING PLAN

GENERAL

Continuous air monitoring in the EZ during invasive tasks will accompany site operations, as indicated in this HASP or as required by the SSO. Monitoring will be performed to verify the adequacy of respiratory protection, to aid in site layout and to document work exposure. All monitoring instruments shall be operated by qualified personnel only and will be calibrated daily prior to use, or more often as necessary. For additional references and information, see Hydro Tech's Site-Specific Air Monitoring Program.

REAL-TIME MONITORING

Instrumentation

A PID (to monitor total volatile organic concentrations) will be used to measure worker breathing zone ambient on-site concentrations during on-site activities. The equipment will be calibrated daily and the results noted in the project field book. A background level will be established, at a minimum, on a daily basis, and recorded in the field book.

The following response actions will be taken based on PID readings in the breathing zone. All work will be performed in level D PPE unless breathing zone volatile organic concentrations exceed 5 ppm. Once levels of 25 ppm are measured, work will be stopped.

Volatile Organics	Photoionization Detector (PID)	>5ppm	Temporarily halt work activities & monitor until readings decrease to below 5ppm.
		>5ppm<25ppm	Halt work activities, upgrade to level C continue monitoring.
		>25ppm	Shut down work activities

During soil excavation, particulate monitoring will be performed using a real-time particulate monitor that will monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

Object to be measured: Dust. Mists, Aerosols
Size range: < 0.1 to 10 microns
Sensitivity: 0.001 mg/m3
Overall Accuracy: = 10% as compared to gravimetric analysis of stearic acid or reference dust.

Particulate levels will be monitored immediately downwind at the working site and integrated

over a period not to exceed 15 minutes. The action level will be established at 150 ug/m3 over the integrated period not to exceed 15 minutes.

Action Levels
Action levels for upgrading of PPE in this Construction HASP will apply to all site work during the duration of field activities at the Site. The action level is the presence of visible airborne dust. When airborne dust is observed, specific dust-mitigating procedures will be implemented. These dust-mitigating procedures are documented in Section 6.0.

11.0 SAFETY CONSIDERATIONS

GENERAL
In addition to the specific requirements of this HASP, common sense should be used at all times. The general safety rules and practices below will be in effect at the Site at the discretion of the Project Manager, SSO or other authorized personnel.

- The site will be suitably marked or barricaded as necessary to prevent unauthorized visitors but not hinder emergency services if needed.

- As needed, all open holes, trenches, and obstacles will be properly barricaded in accordance with local site requirements. These requirements will be determined by proximity to traffic ways, both pedestrian and vehicular, and site of the hole, trench, or obstacle. If holes are required to be left open during non-working hours, they will be adequately decked over or barricaded and sufficiently lighted.

- Before any digging or boring operations are conducted, underground utility locations will be identified. All boring, excavation, and other site work will be planned and performed with consideration for underground lines. Any excavation work will be performed in accordance with Hydro Tech's Standard Operating Procedures for Excavations.

- Either workers or other people will enact dust-mitigating procedures when the potential for the inhalation of dust particles is present.

- The act of smoking and/or ignition sources in the vicinity of potentially flammable or contaminated material is strictly prohibited.

- Drilling, boring, and use of cranes and drilling rigs, erection of towers, movement of vehicles and equipment and other activities will be planned and performed with consideration for the location, height, and relative position of aboveground utilities and fixtures, including signs; canopies; building and other structures and construction; and natural features such as trees, boulders, bodies of water, and terrain.

- When working in areas where flammable vapors may be present, particular care shall be exercised with tools and equipment that may be sources of ignition. All tools and equipment provided must be properly bonded and/or grounded. Metal buttons and zippers are prohibited on safety clothing for areas that may contain a flammable or explosive atmosphere.

- Approved and appropriate safety equipment (as specified in this Construction HASP), such as eye protection, hard hats, foot protection, and respirators, must be worn in areas where

required. In addition, eye protection must be worn when sampling soil or water that may be contaminated.

- No smoking, eating, chewing tobacco, gum chewing, or drinking will be allowed in the contaminated areas.

- Contaminated tools and hands must be kept away from the face.

- Personnel must use personal hygiene safe guards (washing up) at the end of the shift or as soon as possible after leaving the Site.

- Each sample must be treated and handled as though it were contaminated.

- Persons with long hair and/or loose fitting clothing that could become entangled in power equipment must take adequate precautions.

- Horseplay is prohibited in the work area.

- Work while under the influence of intoxicants, narcotics, or controlled substances is prohibited.

POSTED SIGNS

Posted danger signs will be used where an immediate hazard exists. Caution signs will be posted to warn against potential hazards and to caution against unsafe practices. Traffic control methods and barricades will be used as needed. Wooden stakes and flagging tape, or equally effective material will be used to demarcate all restricted areas.

Other postings may include the OSHA poster, emergency hospital route, and telephone numbers of contact personnel.

INVASIVE OPERATIONS

The SSO will be present on-Site during all invasive work (e.g. excavations and capping). The SSO will ensure that appropriate monitoring, levels of protection, and safety procedures are followed. No personnel will enter any excavations for any reasons. All non-essential personnel will stay at least 10 feet back from the edge of the excavation and out of the swing radius of the backhoe. No drums or other potential sources will be sampled or removed during this phase without further additions to the Construction HASP.

The proximity of water, sewer, and electrical lines will be identified prior to invasive operations. The possibility of the presence of underground conduits or vessels containing materials under pressure will also be investigated prior to invasive operations. Properly-sized containment systems will be utilized and consideration of the potential volume of liquid or waste released during operations will be discussed with members of the field team to minimize the potential for spills and provide a method for collection of waste materials. Emergency evacuation procedures and the location of safety equipment will be established prior to start up operations. The use of protective clothing, especially hard hats, boots, and gloves will be required during drilling and other heavy equipment work.

SOIL, GROUNDWATER AND LIQUID WASTE SAMPLING

During Site invasive excavation, soil sampling for waste characterization may be required for disposal purposes. No groundwater or liquid waste sampling is anticipated during site

remediation.

HEAVY EQUIPMENT DECONTAMINATION
Personnel steam cleaning heavy equipment, if necessary shall use the prescribed level of protection and adhere to the buddy system. Initially this task usually employs Level C. The heavy equipment decontamination shall be restricted to authorized personnel only. Special consideration will be given to wind speed and direction. Downwind areas are to be kept free of personnel to avoid unnecessary exposure to potential airborne contamination.

ADDITIONAL SAFETY CONSIDERATIONS
No other additional safety considerations at this time.

12.0 DECONTAMINATION AND DISPOSAL PROCEDURES

CONTAMINATION PREVENTION
One of the most important aspects of decontamination is the prevention of contamination. Good contamination prevention should minimize worker exposure and help ensure valid sample results by precluding cross-contamination. Procedures for contamination avoidance include:

Personnel:
Do not walk through areas of obvious or known contamination.
Do not directly handle or touch contaminated materials.
Make sure that there are no cuts or tears on PPE.
Fasten all closures in suits; cover with tape if necessary.
Particular care should be taken to prevent any skin injuries.
Stay upwind of airborne contaminants.
Do not carry cigarettes, cosmetics, gum, etc. into contaminated areas.

Sampling and Monitoring:
When required by the SSO, cover instruments with clear plastic, leaving openings for sampling ports. Keep all decontaminated sampling materials in bags prior to emplacement of sample matrix.

Heavy Equipment:
Care should be taken to limit the amount of contamination that comes in contact with heavy equipment (tires). Dust control measures may be needed on roads inside the site boundaries.

PERSONNEL DECONTAMINATION
All personnel shall pass through an outlined decontamination procedure when exiting the hot zone at each location. A field wash for equipment and PPE shall be set up at each work location. The system will include a gross wash and rinse for all disposable clothing and boots worn in the EZ. Upon exiting the EZ, all personnel will wash their hands, arms, neck, and face before entering the Support Zone.

EQUIPMENT DECONTAMINATION
Equipment used at the Site that is potentially contaminated shall be decontaminated to prevent hazardous materials from leaving the Site. All heavy equipment will be decontaminated at the decontamination pad and inspected by the SSO and Project Manager before it leaves the Site. The decontamination area will provide for the containment of all wastewater from the decontamination process. Respirators, airline and any other personnel equipment that comes in contact with contaminated soils shall pass through a field wash.

DECONTAMINATION DURING MEDICAL EMERGENCIES

If emergency life-saving first aid and/or medical treatment are required, normal decontamination procedures may need to be abbreviated or omitted. The Site SSO or designee will accompany contaminated victims to the medical facility to provide advice on matters involving decontamination, when necessary. The outer garments can be removed if they do not cause delays, interfere with treatment, or aggravate the problem. Respiratory equipment must always be removed. Protective clothing can be cut away. If the outer contaminated garments cannot be safely removed, a plastic barrier between the individual and clean surfaces should be used to help prevent contaminating the inside of ambulances and /or medical personnel. Outer garments are then removed at the medical facility.

No attempt will be made to wash or rinse the victim, unless it is known that the individual has been contaminated with an extremely toxic or corrosive material that could also cause severe injury or loss of life to emergency response personnel. For minor medical problems or injuries, the normal decontamination procedures will be followed. Note that heat stroke requires prompt treatment to prevent irreversible damage or death. Protective clothing must be promptly removed. Less serious forms of heat stress also require prompt attention and removal of protective clothing immediately. Decontamination should be omitted or minimized and treatment begun immediately unless the victim is obviously contaminated.

DISPOSAL PROCEDURES

The SSO and Project Manager will develop a segregating system of non-hazardous waste and hazardous waste. All discarded material, waste materials, or other objects shall be handled in such a way as to preclude the potential for spreading contamination, creating sanitary hazards, orcausing litter to be left on site. All potentially contaminated materials, e.g. clothing, gloves, etc., will be bagged or drummed as necessary, labeled and segregated for disposal. All non-contaminated materials shall be collected and bagged for appropriate disposal as normal domestic waste.

13.0 EMERGENCY PLAN

The potential for the development of an emergency situation is low considering the low concentrations of hazardous substances at the work site. Nevertheless, an emergency situation could occur. All personnel, prior to the start of work, will know the emergency plan outlined in this section. The emergency plan will be available for use at all times during site work.

Various individual site characteristics will determine preliminary actions taken to assure that this emergency plan is successfully implemented in the event of a site emergency. Careful consideration must be given to the proximity of neighborhood housing or places of employment, and to the relative possibility of site fire, explosion or release of vapors or gases that could affect the surrounding community.

The Project Manager shall make contact with local fire, police, and other emergency units prior to beginning work on site. In these contacts, the Project Manager will inform the emergency units about the nature and duration of work expected to the Site and the type of contaminants and the possible health or safety effects of emergencies involving these contaminants. At this time, the Project Manager and the emergency response units shall make the necessary arrangements to be prepared for any emergencies that could occur.

The Project Manager shall implement the contingency plan whenever conditions at the Site warrant such action. The Project Manager will be responsible for coordination of the evacuation emergency treatment, and transportation of site personnel as necessary, and notification of emergency response units and the appropriate management staff.

EVACUATION

In the event of an emergency situation, such as fire, explosion, or significant release of toxic gases, an air horn or other appropriate device will be sounded for approximately 10 second intervals indicating the initiation of evacuation procedures. All personnel will evacuate and assemble near the entrance to the site. The location shall be upwind of the Site where possible.

For efficient and safe site evacuation and assessment of the emergency situation, the Project Manager will have authority to initiate action if outside services are required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been given. The SSO or designated SSO must ensure that access for emergency equipment is provided and that all combustion apparatuses have been shut down once the alarm has been sounded. Once the safety of all personnel is established, the Fire Department and other emergency response groups as necessary will be notified by telephone of the emergency.

POTENTIAL OR ACTUAL FIRE OR EXPLOSION

Immediately evacuate the Site (air horn will sound for 10-second intervals), notify the local fire and police departments, and other appropriate emergency response groups if an actual fire or explosion has taken place.

PERSONNEL INJURY

Emergency first aid shall be applied on site as deemed necessary. If necessary, the individual shall be decontaminated and transported to the nearest medical facility.

The ambulance/rescue squad shall be contacted for transport as necessary in an emergency. However, since some situations may require transport of an injured party by other means, the hospital route is identified below. A map to this facility provided with this HASP in Section 2.2.3.

ACCIDENT/INCIDENT REPORTING

As soon as first aid and/or emergency response needs have been met, the employer of the injured party must be immediately notified of any incident. Written confirmation of verbal reports is to be submitted within 24 hours. A standard report form entitled "Accident Data Report" is to be used for this purpose.

For reporting purposes, the term accident refers to fatalities, lost time injuries, spill, or exposure to hazardous materials (toxic materials, explosive or flammable materials).

Any information released from the health care provider, which is not deemed confidential patient information, is to be attached to the appropriate form. Any medical information that is released by patient consent is to be filed in the individuals' medical records and treated as confidential.

OVERT PERSONNEL EXPOSURE

SKIN CONTACT: Use copious amounts of soap and water. Wash/rinse affected area thoroughly, and then provide appropriate medical attention.

	Eyes should be rinsed for 15 minutes upon chemical contamination.
INHALATION:	Move personnel to fresh air and if necessary, decontaminate and transport to hospital.
INGESTION:	Decontamination and transport to emergency medical facility.
PUNCTURE WOUND OR LACERATION:	Decontaminate and transport to emergency medical facility.

ADVERSE WEATHER CONDITIONS

In the event of adverse weather conditions, the SSO or designee will determine if work can continue without sacrificing the health and safety of all field workers. Some of the items to be considered prior to determining if work should continue are:

* Potential for heat stress and heat-related injuries
* Potential for cold stress and cold-related injuries
* Treacherous weather-related conditions
* Limited visibility
* Potential for electrical storms

Site activities will be limited to daylight hours and acceptable weather conditions. Inclement working conditions include heavy rain, fog, high winds, and lighting. Observe daily weather reports and evacuate if necessary in case of inclement weather conditions.

EMERGENCY RESPONSE EQUIPMENT LIST

Some or all of the following will either be available on-Site or be able to be brought to the Site within a 2-hour period:

* 55 Gallon Drums
* 85 Gallon Drums
* Absorbent Pads
* Absorbent Booms
* Speedy-Dry
* Plastic Sheeting
* Hay Bales
* Pneumatic Nibbler
* Back Hoe
* Pressure Washer
* Air Compressor
* Wilden Pumps
* Equipment Storage Trailer
* Submersible Pumps
* Miscellaneous Hand Tools
* Portable Lighting

LARGE EQUIPMENT

If necessary, the following large equipment will be brought to the Site within 2-hours:

* Large Vacuum Truck
* Super Sucker
* Dump Trucks
* Drill Rig
* Utility Vehicle

14.0 LOGS, REPORTS AND RECORD KEEPING

Medical and Training Records

The Site Superintendent keeps medical and training records. All subcontractors must provide verification of training and medical qualifications to the Site Superintendent. The Site Superintendent will keep a log of personnel meeting appropriate training and medical qualifications for site work. The log will be kept in the project file. Medical records will be maintained in accordance with 29 CFR 1910.20.

Onsite Log

A log of personnel onsite each day will be kept by the Site Superintendent. Originals will be kept in the project file.

Exposure Records

Any monitoring results, laboratory reports, calculations and air sampling data sheets are part of an employee exposure record. These records will be kept in accordance with 29 CFR 1910.20. The originals will be sent to the Hydro Tech records coordinator. For subcontractor employees, the original will be sent to the subcontractor employer and a copy kept in the project file.

Accident/Incident Reports

An accident/incident report must be completed for all accidents and incidents. Hydro Tech will send the originals to the appropriate Hydro Tech records coordinator for maintenance. Copies will be distributed as stated. A copy of the forms will be kept in the project file.

OSHA Form 200

An OSHA Form 200 (Log of Occupational Injuries and Illnesses) will be kept at the Site. All recordable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to the Hydro Tech corporate records administrator for maintenance. Subcontractor employers must also meet the requirements of maintaining an OSHA 200 form. The Hydro Tech accident/incident report meets the requirements of the OSHA Form 101 (Supplemental Record) and must be maintained with the OSHA Form 200 for all recordable injuries or illnesses.

Health and Safety Field Log Book

The SSO or designee will maintain the logbook in accordance with standard Hydro Tech procedures. Daily site conditions, activities, personnel, calibration records, monitoring results and significant events will be recorded. The original logbooks will become part of the exposure records file.

15.0 SANITATION

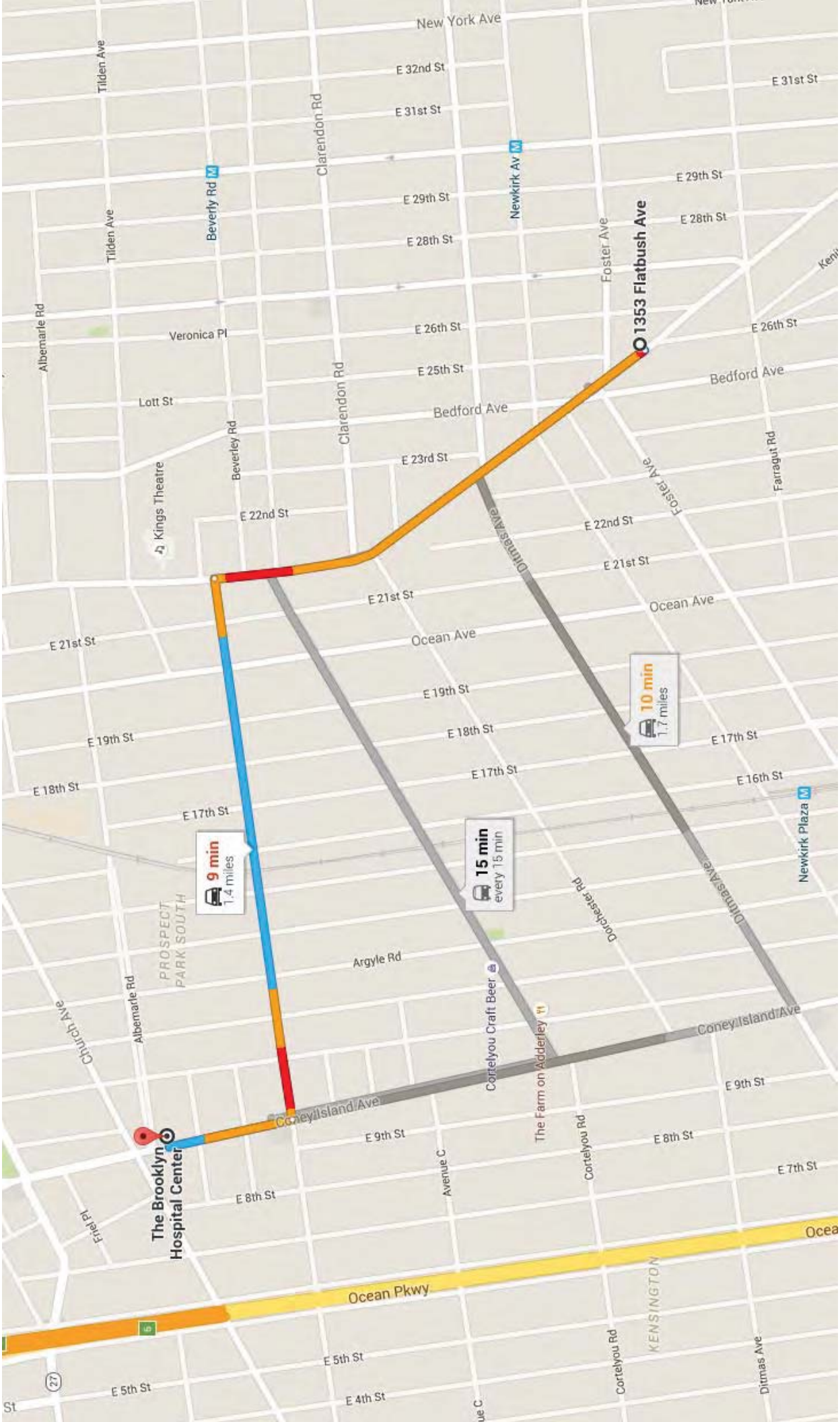
Since sanitary sewer connection has not been established, provisions shall be made for access to sanitary systems by using nearby public facilities consistent with provisions of governing local ordinance codes. This will include the use of outside firms providing and maintaining "Porta Potties" or similar devices.

If a commercial/industrial laundry is used to clean or launder clothing that is potentially contaminated, they shall be informed of the potential harmful effects of exposure to hazardous substances related to the affected clothing.

Personnel and subcontractors sites shall follow decontamination procedures described in the Construction HASP. This will generally include, when necessary, site-specific training in shower usage and cleanup, personal hygiene requirements and the donning of protective equipment/clothing.

FIGURE 1
DIRECTIONS TO HOSPITAL

ATTACHMENT A
HEALTH AND SAFETY FACT SHEETS


1353 Flatbush Ave
The Brooklyn Hospital Center
9 min
1.4 miles
15 min
every 15 min
10 min
1.7 miles
New York Ave
E 32nd St
E 31st St
E 29th St
E 28th St
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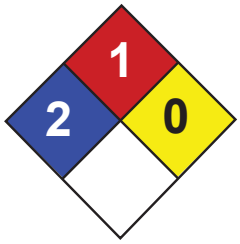
E 18th St
E 17th St
E 16th St
E 9th St
E 8th St
E 7th St
E 5th St
E 4th St
Bedford Ave
Ocean Ave
Coney Island Ave
Ocean Pkwy
Argyle Rd
Lott St
Veronica Pl
Tilden Ave
Albemarle Rd
Beverly Rd
Clarendon Rd
Newkirk Av
Foster Ave
Farragut Rd
Ditmas Ave
Dutchester Rd
Cortelyou Rd
Avenue C
Church Ave
Fiske Pl
Kings Theatre
Cortelyou Craft Beer
The Farm on Adderley
Newkirk Plaza
PROSPECT PARK SOUTH
KENSINGTON

ATTACHMENT A
HEALTH AND SAFETY FACT SHEETS



Health	2
Fire	1
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Trichloroethylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Trichloroethylene

Catalog Codes: SLT3310, SLT2590

CAS#: 79-01-6

RTECS: KX4560000

TSCA: TSCA 8(b) inventory: Trichloroethylene

CI#: Not available.

Synonym:

Chemical Formula: C2HCl3

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Trichloroethylene	79-01-6	100

Toxicological Data on Ingredients: Trichloroethylene: ORAL (LD50): Acute: 5650 mg/kg [Rat]. 2402 mg/kg [Mouse]. DERMAL (LD50): Acute: 20001 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified A5 (Not suspected for human.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to kidneys, the nervous system, liver, heart, upper respiratory tract. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 420°C (788°F)

Flash Points: Not available.

Flammable Limits: LOWER: 8% UPPER: 10.5%

Products of Combustion: These products are carbon oxides (CO, CO2), halogenated compounds.

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/

spray. Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Carcinogenic, teratogenic or mutagenic materials should be stored in a separate locked safety storage cabinet or room.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 50 STEL: 200 (ppm) from ACGIH (TLV) TWA: 269 STEL: 1070 (mg/m3) from ACGIH Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 131.39 g/mole

Color: Clear Colorless.

pH (1% soln/water): Not available.

Boiling Point: 86.7°C (188.1°F)

Melting Point: -87.1°C (-124.8°F)

Critical Temperature: Not available.

Specific Gravity: 1.4649 (Water = 1)

Vapor Pressure: 58 mm of Hg (@ 20°C)

Vapor Density: 4.53 (Air = 1)

Volatility: Not available.

Odor Threshold: 20 ppm

Water/Oil Dist. Coeff.: The product is equally soluble in oil and water; log(oil/water) = 0

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol, diethyl ether, acetone.

Solubility:
Easily soluble in methanol, diethyl ether, acetone. Very slightly soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity:
Extremely corrosive in presence of aluminum. Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
Acute oral toxicity (LD50): 2402 mg/kg [Mouse]. Acute dermal toxicity (LD50): 20001 mg/kg [Rabbit].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified + (PROVEN) by OSHA. Classified A5 (Not suspected for human.) by ACGIH. The substance is toxic to kidneys, the nervous system, liver, heart, upper respiratory tract.

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Passes through the placental barrier in human. Detected in maternal milk in human.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Trichloroethylene : UN1710 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Trichloroethylene California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Trichloroethylene Pennsylvania RTK: Trichloroethylene Florida: Trichloroethylene Minnesota: Trichloroethylene Massachusetts RTK: Trichloroethylene New Jersey: Trichloroethylene TSCA 8(b) inventory: Trichloroethylene CERCLA: Hazardous substances.: Trichloroethylene

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R36/38- Irritating to eyes and skin. R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:54 PM

Last Updated: 11/01/2010 12:00 PM

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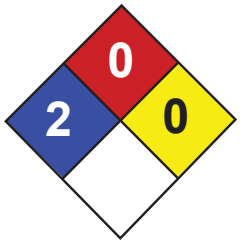

Health	2
Fire	0
Reactivity	0
Personal Protection	G

Material Safety Data Sheet
Tetrachloroethylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Tetrachloroethylene

Catalog Codes: SLT3220

CAS#: 127-18-4

RTECS: KX3850000

TSCA: TSCA 8(b) inventory: Tetrachloroethylene

CI#: Not available.

Synonym: Perchloroethylene; 1,1,2,2-Tetrachloroethylene; Carbon bichloride; Carbon dichloride; Ankilostin; Didakene; Dilatin PT; Ethene, tetrachloro-; Ethylene tetrachloride; Perawin; Perchlor; Perclene; Perclene D; Percosolvel; Tetrachloroethene; Tetraleno; Tetralex; Tetravec; Tetroguer; Tetropil

Chemical Name: Ethylene, tetrachloro-

Chemical Formula: C2-Cl4

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Tetrachloroethylene	127-18-4	100

Toxicological Data on Ingredients: Tetrachloroethylene: ORAL (LD50): Acute: 2629 mg/kg [Rat]. DERMAL (LD): Acute: >3228 mg/kg [Rabbit]. MIST(LC50): Acute: 34200 mg/m 8 hours [Rat]. VAPOR (LC50): Acute: 5200 ppm 4 hours [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of skin contact (permeator), of eye contact (irritant), of ingestion.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2A (Probable for human.) by IARC, 2 (anticipated carcinogen) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, peripheral nervous system, respiratory tract, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with skin. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, metals, acids, alkalis.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Personal Protection:
Safety glasses. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 25 (ppm) from OSHA (PEL) [United States] TWA: 25 STEL: 100 (ppm) from ACGIH (TLV) [United States] TWA: 170 (mg/m3) from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Ethereal.

Taste: Not available.

Molecular Weight: 165.83 g/mole

Color: Clear Colorless.

pH (1% soln/water): Not available.

Boiling Point: 121.3°C (250.3°F)

Melting Point: -22.3°C (-8.1°F)

Critical Temperature: 347.1°C (656.8°F)

Specific Gravity: 1.6227 (Water = 1)

Vapor Pressure: 1.7 kPa (@ 20°C)

Vapor Density: 5.7 (Air = 1)

Volatility: Not available.

Odor Threshold: 5 - 50 ppm

Water/Oil Dist. Coeff.: The product is more soluble in oil; log(oil/water) = 3.4

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Miscible with alcohol, ether, chloroform, benzene, hexane. It dissolves in most of the fixed and volatile oils. Solubility in water: 0.015 g/100 ml @ 25 deg. C It slowly decomposes in water to yield Trichloroacetic and Hydrochloric acids.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, metals, acids, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Oxidized by strong oxidizing agents. Incompatible with sodium hydroxide, finely divided or powdered metals such as zinc, aluminum, magnesium, potassium, chemically active metals such as lithium, beryllium , barium. Protect from light.

Special Remarks on Corrosivity: Slowly corrodes aluminum, iron, and zinc.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 2629 mg/kg [Rat]. Acute dermal toxicity (LD50): >3228 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 5200 4 hours [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH. Classified 2A (Probable for human.) by IARC, 2 (Some evidence.) by NTP. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. May cause damage to the following organs: kidneys, liver, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of inhalation. Slightly hazardous in case of skin contact (permeator), of ingestion.

Special Remarks on Toxicity to Animals:
Lowest Publishe Lethal Dose/Conc: LDL [Rabbit] - Route: Oral; Dose: 5000 mg/kg LDL [Dog] - Route: Oral; Dose: 4000 mg/kg LDL [Cat] - Route: Oral; Dose: 4000 mg/kg

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects and birth defects(teratogenic). May affect genetic material (mutagenic). May cause cancer.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes skin irritation with possible dermal blistering or burns. Symtoms may include redness, itching, pain, and possible dermal blistering or burns. It may be absorbed through the skin with possible systemic effects. A single prolonged skin exposure is not likely to result in the material being absorbed in harmful amounts. Eyes: Contact causes transient eye irritation, lacrimation. Vapors cause eye/conjunctival irritation. Symptoms may include redness and pain. Inhalation: The main route to occupational exposure is by inhalation since it is readily absorbed through the lungs. It causes respiratory tract irritation, . It can affect behavior/central nervous system (CNS depressant and anesthesia ranging from slight inebriation to death, vertigo, somnolence, anxiety, headache, excitement, hallucinations, muscle incoordination, dizziness, lightheadness, disorentiation, seizures, enotional instability, stupor, coma). It may cause pulmonary edema Ingestion: It can cause nausea, vomiting, anorexia, diarrhea, bloody stool. It may affect the liver, urinary system (proteinuria, hematuria, renal failure, renal tubular disorder), heart (arrhythmias). It may affect behavior/central nervous system with symptoms similar to that of inhalation. Chronic Potential Health Effects: Skin: Prolonged or repeated skin contact may result in excessive drying of the skin, and irritation. Ingestion/Inhalation: Chronic exposure can affect the liver(hepatitis,fatty liver degeneration), kidneys, spleen, and heart (irregular heartbeat/arrhythmias, cardiomyopathy, abnormal EEG), brain, behavior/central nervous system/peripheral nervous system (impaired memory, numbness of extremeties, peripheral neuropathy and other

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 18.4 mg/l 96 hours [Fish (Fatthead Minnow)]. 18 mg/l 48 hours [Daphnia (daphnia)]. 5 mg/l 96 hours [Fish (Rainbow Trout)]. 13 mg/l 96 hours [Fish (Bluegill sunfish)].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Tetrachloroethylene UNNA: 1897 PG: III

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Tetrachloroethylene California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Tetrachloroethylene Connecticut hazardous material survey.: Tetrachloroethylene Illinois toxic substances disclosure to employee act: Tetrachloroethylene Illinois chemical safety act: Tetrachloroethylene New York release reporting list: Tetrachloroethylene Rhode Island RTK hazardous substances: Tetrachloroethylene Pennsylvania RTK: Tetrachloroethylene Minnesota: Tetrachloroethylene Michigan critical material: Tetrachloroethylene Massachusetts RTK: Tetrachloroethylene Massachusetts spill list: Tetrachloroethylene New Jersey: Tetrachloroethylene New Jersey spill list: Tetrachloroethylene Louisiana spill reporting: Tetrachloroethylene California Director's List of Hazardous Substances: Tetrachloroethylene TSCA 8(b) inventory: Tetrachloroethylene TSCA 8(d) H and S data reporting: Tetrachloroethylene: Effective date: 6/1/87; Sunset date: 6/1/97 SARA 313 toxic chemical notification and release reporting: Tetrachloroethylene CERCLA: Hazardous substances.: Tetrachloroethylene: 100 lbs. (45.36 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R40- Possible risks of irreversible effects. R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. S23- Do not breathe gas/fumes/vapour/spray S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S37- Wear suitable gloves. S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: g

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
p-Xylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: p-Xylene

Catalog Codes: SLX1120

CAS#: 106-42-3

RTECS: ZE2625000

TSCA: TSCA 8(b) inventory: p-Xylene

CI#: Not applicable.

Synonym: p-Methyltoluene

Chemical Name: 1,4-Dimethylbenzene

Chemical Formula: C6H4(CH3)2

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
{p-}Xylene	106-42-3	100

Toxicological Data on Ingredients: p-Xylene: ORAL (LD50): Acute: 5000 mg/kg [Rat.]. DERMAL (LD50): Acute: 12400 mg/kg [Rabbit.]. VAPOR (LC50): Acute: 4550 ppm 4 hour(s) [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (irritant), of eye contact (irritant). Slightly hazardous in case of skin contact (permeator), of ingestion, of inhalation. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant).
Slightly hazardous in case of skin contact (permeator), of ingestion, of inhalation.
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance is toxic to blood, kidneys, the nervous system, liver.
Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation: Not available.

Ingestion:
Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 527°C (980.6°F)

Flash Points: CLOSED CUP: 25°C (77°F). OPEN CUP: 28.9°C (84°F) (Cleveland).

Flammable Limits: LOWER: 1.1% UPPER: 7%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances: Highly flammable in presence of open flames and sparks, of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable liquid, insoluble in water.
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards:
Explosive in the form of vapor when exposed to heat or flame. Vapor may travel considerable distance to source of ignition and flash back. When heated to decomposition it emits acrid smoke and irritating fumes.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Toxic flammable liquid, insoluble or very slightly soluble in water.
Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes Keep away from incompatibles such as oxidizing agents.

Storage:
Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. A refrigerated room would be preferable for materials with a flash point lower than 37.8°C (100°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 100 STEL: 150 (ppm) from ACGIH (TLV)
TWA: 434 STEL: 651 (mg/m3) from ACGIHConsult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid. (Liquid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 106.17 g/mole

Color: Colorless.

pH (1% soln/water): Not applicable.

Boiling Point: 138°C (280.4°F)

Melting Point: 12°C (53.6°F)

Critical Temperature: Not available.

Specific Gravity: 0.86 (Water = 1)

Vapor Pressure: 9 mm of Hg (@ 20°C)

Vapor Density: 3.7 (Air = 1)

Volatility: Not available.

Odor Threshold: 0.62 ppm

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol, diethyl ether.

Solubility:
Easily soluble in methanol, diethyl ether.
Insoluble in cold water, hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Eye contact.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE.
Acute oral toxicity (LD50): 5000 mg/kg [Rat.].
Acute dermal toxicity (LD50): 12400 mg/kg [Rabbit.].
Acute toxicity of the vapor (LC50): 4550 ppm 4 hour(s) [Rat].

Chronic Effects on Humans: The substance is toxic to blood, kidneys, the nervous system, liver.

Other Toxic Effects on Humans:
Very hazardous in case of skin contact (irritant).
Slightly hazardous in case of skin contact (permeator), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:

0347 Animal: embryotoxic, foetotoxic, passes through the placental barrier.
0900 Detected in maternal milk in human.
Narcotic effect; may cause nervous system disturbances.

Special Remarks on other Toxic Effects on Humans: Material is irritating to mucous membranes and upper respiratory tract.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: Class 3: Flammable liquid.

Identification: : Xylene : UN1307 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Pennsylvania RTK: p-Xylene
Florida: p-Xylene
Massachusetts RTK: p-Xylene
New Jersey: p-Xylene
TSCA 8(b) inventory: p-Xylene
SARA 313 toxic chemical notification and release reporting: p-Xylene
CERCLA: Hazardous substances.: p-Xylene

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).
CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R10- Flammable.
R38- Irritating to skin.
R41- Risk of serious damage to eyes.
R48/20- Harmful: danger of serious

damage to health by prolonged exposure through inhalation.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Splash goggles.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.
-Material safety data sheet emitted by: la Commission de la SantÃ© et de la SÃ©curitÃ© du Travail du QuÃ©bec.
-SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984.
-The Sigma-Aldrich Library of Chemical Safety Data, Edition II.
-Guide de la loi et du rÃ¨glement sur le transport des marchandises dangeureuses au canada. Centre de conformitÃ© internatinal LtÃ©e. 1986.

Other Special Considerations: Not available.

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Health	2
Fire	3
Reactivity	0
Personal Protection	J

Material Safety Data Sheet
m-Xylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: m-Xylene

Catalog Codes: SLX1066

CAS#: 108-38-3

RTECS: ZE2275000

TSCA: TSCA 8(b) inventory: m-Xylene

CI#: Not applicable.

Synonym: m-Methyltoluene

Chemical Name: 1,3-Dimethylbenzene

Chemical Formula: C6H4(CH3)2

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
{m-}Xylene	108-38-3	100

Toxicological Data on Ingredients: m-Xylene: ORAL (LD50): Acute: 5000 mg/kg [Rat.]. DERMAL (LD50): Acute: 14100 mg/kg [Rabbit.].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (irritant), of eye contact (irritant). Slightly hazardous in case of skin contact (permeator), of ingestion, of inhalation. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant).
Slightly hazardous in case of skin contact (permeator), of ingestion, of inhalation.
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance is toxic to blood, kidneys, the nervous system, liver.
Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation: Not available.

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 527°C (980.6°F)

Flash Points: CLOSED CUP: 25°C (77°F). OPEN CUP: 28.9°C (84°F) (Cleveland).

Flammable Limits: LOWER: 1.1% UPPER: 7%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances: Highly flammable in presence of open flames and sparks, of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable liquid, insoluble in water.
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards:
Explosive in the form of vapor when exposed to heat or flame. Vapor may travel considerable distance to source of ignition and flash back. When heated to decomposition it emits acrid smoke and irritating fumes.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid, insoluble in water.

Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes Keep away from incompatibles such as oxidizing agents.

Storage:
Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. A refrigerated room would be preferable for materials with a flash point lower than 37.8°C (100°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection: Splash goggles. Lab coat. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 100 STEL: 150 (ppm) from ACGIH (TLV)
TWA: 434 STEL: 651 (mg/m3) from ACGIHConsult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid. (Liquid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 106.17 g/mole

Color: Colorless.

pH (1% soln/water): Not applicable.

Boiling Point: 139.3°C (282.7°F)

Melting Point: -47.87°C (-54.2°F)

Critical Temperature: Not available.

Specific Gravity: 0.86 (Water = 1)

Vapor Pressure: 6 mm of Hg (@ 20°C)

Vapor Density: 3.7 (Air = 1)

Volatility: Not available.

Odor Threshold: 0.62 ppm

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol, diethyl ether.

Solubility:
Easily soluble in methanol, diethyl ether.
Insoluble in cold water, hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Eye contact.

Toxicity to Animals:
Acute oral toxicity (LD50): 5000 mg/kg [Rat.].
Acute dermal toxicity (LD50): 14100 mg/kg [Rabbit.].

Chronic Effects on Humans: The substance is toxic to blood, kidneys, the nervous system, liver.

Other Toxic Effects on Humans:
Very hazardous in case of skin contact (irritant).
Slightly hazardous in case of skin contact (permeator), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
0347 Animal: embryotoxic, foetotoxic, passes through the placental barrier.
0900 Detected in maternal milk in human.
Narcotic effect; may cause nervous system disturbances.

Special Remarks on other Toxic Effects on Humans: Material is irritating to mucous membranes and upper respiratory tract.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: Class 3: Flammable liquid.

Identification: : Xylene : UN1307 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Pennsylvania RTK: m-Xylene
Massachusetts RTK: m-Xylene
TSCA 8(b) inventory: m-Xylene
SARA 313 toxic chemical notification and release reporting: m-Xylene
CERCLA: Hazardous substances.: m-Xylene

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).
CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R10- Flammable.
R38- Irritating to skin.
R41- Risk of serious damage to eyes.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: j

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Wear appropriate respirator when ventilation is inadequate.
Splash goggles.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.
-Material safety data sheet emitted by: la Commission de la SantÃ© et de la SÃ©curitÃ© du Travail du QuÃ©bec.
-SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984.
-The Sigma-Aldrich Library of Chemical Safety Data, Edition II.
-Guide de la loi et du rÃ¨glement sur le transport des marchandises dangeureuses au canada. Centre de conformitÃ© internatinal LtÃ©e. 1986.

Other Special Considerations: Not available.

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Health	0
Fire	2
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Mesitylene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Mesitylene

Catalog Codes: SLM2410

CAS#: 108-67-8

RTECS: OX6825000

TSCA: TSCA 8(b) inventory: Mesitylene

CI#: Not available.

Synonym: 1,3,5-Trimethylbenzene

Chemical Formula: C9H12

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Mesitylene	108-67-8	100

Toxicological Data on Ingredients: Mesitylene: VAPOR (LC50): Acute: 4881.9 ppm 4 hour(s) [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of eye contact (irritant), of ingestion, of inhalation (lung irritant). Slightly hazardous in case of skin contact (irritant, permeator), .

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes,

keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact: Not available.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 559°C (1038.2°F)

Flash Points: CLOSED CUP: 43°C (109.4°F).

Flammable Limits: Not available.

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water.
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:
Flammable liquid.
Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Be careful that the product is not present at a

concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapour/spray. Avoid contact with eyes Wear suitable protective clothing If ingested, seek medical advice immediately and show the container or the label.

Storage:
Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. Keep container dry. Keep in a cool place.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 25 CEIL: 35 (ppm)
TWA: 125 CEIL: 170 (mg/m3)
Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Aromatic.

Taste: Not available.

Molecular Weight: 120.2 g/mole

Color: Not available.

pH (1% soln/water): Not available.

Boiling Point: 164.7°C (328.5°F)

Melting Point: -44.8°C (-48.6°F)

Critical Temperature: Not available.

Specific Gravity: 0.8637 (Water = 1)

Vapor Pressure: 1.86 mm of Hg (@ 20°C)

Vapor Density: 4.14 (Air = 1)

Volatility: Not available.

Odor Threshold: 0.23 ppm

Water/Oil Dist. Coeff.: The product is equally soluble in oil and water; log(oil/water) = 0

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Very slightly soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Eye contact. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE.
Acute toxicity of the vapor (LC50): 4881.9 ppm 4 hour(s) [Rat].

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans:
Hazardous in case of ingestion, of inhalation (lung irritant).
Slightly hazardous in case of skin contact (irritant, permeator), .

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: Class 3: Flammable liquid.

Identification: : 1,3,5-Trimethylbenzene : UN2325 PG: III

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
Florida: Mesitylene
New Jersey: Mesitylene
TSCA 8(b) inventory: Mesitylene

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).

DSCL (EEC):
R10- Flammable.
R36/37- Irritating to eyes and respiratory system.

HMIS (U.S.A.):

Health Hazard: 0

Fire Hazard: 2

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 0

Flammability: 2

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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International Chemical Safety Cards

BENZO(B)FLUORANTHENE

ICSC: 0720

BENZO(B)FLUORANTHENE
Benzo(e)acephenanthrylene
2,3-Benzofluoroanthene
$C_{20}H_{12}$
Molecular mass: 252.3

CAS # 205-99-2
RTECS # CU1400000
ICSC # 0720

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray, powder.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE! AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
• **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. Refer for medical attention. Wear protective gloves when administering first aid.
• **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.	Wear protective gloves when inducing vomiting. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	Provision to contain effluent from fire extinguishing. Tightly closed.	Unbreakable packaging; put breakable packaging into closed unbreakable container.

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0720

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International Chemical Safety Cards

BENZO(B)FLUORANTHENE

ICSC: 0720

IMPORTANT DATA	**PHYSICAL STATE; APPEARANCE:** COLOURLESS TO YELLOW CRYSTALS. **PHYSICAL DANGERS:** **CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. **OCCUPATIONAL EXPOSURE LIMITS (OELs):** TLV not established.	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation 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.
PHYSICAL PROPERTIES	Melting point: 168°C Solubility in water: none	Vapour pressure, Pa at 20°C: <10 Octanol/water partition coefficient as log Pow: 6.04
ENVIRONMENTAL DATA	This substance may be hazardous to the environment; special attention should be given to the total environment. In the food chain important to humans, bioaccumulation takes place, specifically in oils and fats.	

NOTES

Depending on the degree of exposure, periodic medical examination is indicated. Data are insufficiently available on the effect of this substance on human health, therefore utmost care must be taken. Do NOT take working clothes home.

ADDITIONAL INFORMATION

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

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International Chemical Safety Cards

BENZO(K)FLUORANTHENE

ICSC: 0721

BENZO(K)FLUOROANTHENE
11,12-Benzofluoroanthene
Dibenzo(b,j,k)fluorene
$C_{20}H_{12}$
Molecular mass: 252.3

CAS # 207-08-9
RTECS # DF6350000
ICSC # 0721

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray, powder.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST! STRICT HYGIENE! AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
• **INHALATION**		Local exhaust or breathing protection.	Fresh air, rest. Refer for medical attention.
• **SKIN**	MAY BE ABSORBED!	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention. Wear protective gloves when administering first aid.
• **EYES**		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**		Do not eat, drink, or smoke during work.	Wear protective gloves when inducing vomiting. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.	Provision to contain effluent from fire extinguishing. Separated from strong oxidants. Tightly closed.	

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0721

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International Chemical Safety Cards

BENZO(K)FLUORANTHENE

ICSC: 0721

IMPORTANT DATA	**PHYSICAL STATE; APPEARANCE:** YELLOW CRYSTALS. **PHYSICAL DANGERS:** **CHEMICAL DANGERS:** Upon heating, toxic fumes are formed. Reacts with strong oxidants. **OCCUPATIONAL EXPOSURE LIMITS (OELs):** TLV not established.	**ROUTES OF EXPOSURE:** The substance can be absorbed into the body by inhalation 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.
PHYSICAL PROPERTIES	Boiling point: 480°C Melting point: 215.7°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 the total environment. In the food chain important to humans, bioaccumulation takes place, specifically in oils and fats.	

NOTES

Data are insufficiently available on the effect of this substance on human health, therefore utmost care must be taken. Do NOT take working clothes home.

ADDITIONAL INFORMATION

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

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International Chemical Safety Cards

BENZ(a)ANTHRACENE

ICSC: 0385

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

CAS # 56-55-3
RTECS # CV9275000
ICSC # 0385
EC # 601-033-00-9

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.		Water spray, powder. In case of fire in the surroundings: all extinguishing agents allowed.
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 (extra personal protection: complete protective clothing including self-contained breathing apparatus).	Well closed.	T symbol R: 45 S: 53-45

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0385

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International Chemical Safety Cards

BENZ(a)ANTHRACENE

ICSC: 0385

IMPORTANT DATA

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 (OELs):
TLV not established.

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

In the food chain important to humans, bioaccumulation takes place, specifically in seafood.

NOTES

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.

ADDITIONAL INFORMATION

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

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Material Safety Data Sheet

Benzo[a]pyrene, 98%

ACC# 37175

Section 1 - Chemical Product and Company Identification

MSDS Name: Benzo[a]pyrene, 98%
Catalog Numbers: AC105600000, AC105600010, AC105601000, AC377200000, AC377200010, AC377201000 AC377201000
Synonyms: 3,4-Benzopyrene; 3,4-Benzpyrene; Benzo[def]chrysene.
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
50-32-8	Benzo[a]pyrene	>96	200-028-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow to brown powder.
Danger! May cause harm to the unborn child. May impair fertility. May cause eye, skin, and respiratory tract irritation. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Cancer hazard. May cause allergic skin reaction. May cause heritable genetic damage.
Target Organs: Reproductive system, skin.

Potential Health Effects

Eye: May cause eye irritation.
Skin: May cause skin irritation. May be harmful if absorbed through the skin. May cause an allergic reaction in certain individuals.
Ingestion: May cause irritation of the digestive tract. The toxicological properties of this substance have not been fully investigated. May be harmful if swallowed.
Inhalation: May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. May be harmful if inhaled.
Chronic: May cause cancer in humans. May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects.

Section 4 - First Aid Measures

Eyes: Immediately 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: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.
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. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.
Flash Point: Not available.
Autoignition Temperature: Not available.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: 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. Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.
Storage: 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

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs

Benzo[a]pyrene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (as benzene soluble fraction) (listed under Coal tar pitches).

OSHA Vacated PELs: Benzo[a]pyrene: No OSHA Vacated PELs are listed for this chemical.
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: Powder
Appearance: yellow to brown
Odor: faint aromatic odor
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 495 deg C @ 760 mm Hg
Freezing/Melting Point:175 - 179 deg C
Decomposition Temperature: Not available.
Solubility: 1.60x10-3 mg/l @25°C
Specific Gravity/Density: Not available.
Molecular Formula:C20H12
Molecular Weight:252.31

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Dust generation.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 50-32-8: DJ3675000
LD50/LC50:

Not available.

Carcinogenicity:
CAS# 50-32-8:

- **ACGIH:** A2 - Suspected Human Carcinogen
- **California:** carcinogen, initial date 7/1/87
- **NTP:** Suspect carcinogen
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.
Mutagenicity: Mutagenic effects have occurred in humans.Mutagenic effects have occurred in experimental animals.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 50-32-8: waste number U022.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	NOT REGULATED FOR DOMESTIC TRANSPORT	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOL (Benzo{a} pyrene)
Hazard Class:		9
UN Number:		UN3077
Packing Group:		III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 50-32-8 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 50-32-8: 1 lb final RQ; 0.454 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 50-32-8: immediate, delayed.

Section 313

This material contains Benzo[a]pyrene (CAS# 50-32-8, >96%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

Clean Air Act:

This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
CAS# 50-32-8 is listed as a Priority Pollutant under the Clean Water Act.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 50-32-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Benzo[a]pyrene, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 50-32-8: 0.06 æg/day NSRL

European / International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T N

Risk Phrases:

R 43 May cause sensitization by skin contact.
R 45 May cause cancer.
R 46 May cause heritable genetic damage.
R 60 May impair fertility.
R 61 May cause harm to the unborn child.
R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 53 Avoid exposure - obtain special instructions before use.
S 60 This material and its container must be disposed of as hazardou
s waste.
S 61 Avoid release to the environment. Refer to special instructions
/safety data sheets.

WGK (Water Danger/Protection)
CAS# 50-32-8: No information available.

Canada - DSL/NDSL
CAS# 50-32-8 is listed on Canada's DSL List.

Canada - WHMIS
This product has a WHMIS classification of D2A.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List
CAS# 50-32-8 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 9/02/1997
Revision #7 Date: 6/30/2006

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 event shall Fisher 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 Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet

Chrysene, 98%

ACC# 95251

Section 1 - Chemical Product and Company Identification

MSDS Name: Chrysene, 98%
Catalog Numbers: AC224140000, AC224140010, AC224140050, AC224145000
Synonyms: 1,2-Benzophenanthrene; Benzo(a)phenanthrene; 1,2,5,6-Dibenzonaphthalene.
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
218-01-9	Chrysene	98	205-923-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: very light beige solid.
Caution! May cause eye and skin irritation. May cause respiratory tract irritation. May cause cancer in humans.
Target Organs: Liver, skin.

Potential Health Effects

Eye: May cause eye irritation.
Skin: May cause skin irritation.
Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea.
Inhalation: May cause respiratory tract irritation.
Chronic: May cause cancer according to animal studies.

Section 4 - First Aid Measures

Eyes: Immediately 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. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Ingestion: Do not induce vomiting. 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: Get medical aid immediately. Remove from exposure and move to fresh air

immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
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. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.
Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.
Flash Point: Not applicable.
Autoignition Temperature: Not available.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: ; Flammability: 1; Instability:

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash hands before eating. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Avoid breathing dust.
Storage: Store in a tightly closed container. Store in a cool, dry 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 process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Chrysene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (as benzene soluble fraction) (listed under Coal tar pitches).

OSHA Vacated PELs: Chrysene: No OSHA Vacated PELs are listed for this chemical.
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: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: very light beige
Odor: Not available.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 448 deg C @ 760 mm Hg
Freezing/Melting Point:250-255 deg C
Decomposition Temperature: Not available.
Solubility: insoluble
Specific Gravity/Density: Not available.
Molecular Formula:C18H12
Molecular Weight:228.29

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Dust generation.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 218-01-9: GC0700000
LD50/LC50:
Not available.

Carcinogenicity:
CAS# 218-01-9:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans

- **California:** carcinogen, initial date 1/1/90
- **NTP:** Known carcinogen (listed as Coal tar pitches).
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

Epidemiology: No information found
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: Chrysene was mutagenic to S. Typhimurium in the presence of an exogenous metabolic system.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Water flea LC50 = 1.9 mg/L; 2 Hr.; Unspecified Fish toxicity : LC50 (96hr) Neauthes arenacedentata >1ppm.(Rossi,S.S. et al Marine Pollut. Bull. 1978) Invertebrate toxicity : lethal treshold concentration (24hr) Daphnia Magna 0,7æg/l.(* Newsted,J.L. et al Environ. Toxicol. Chem. 1987) Bioaccumulation : 24hr Daphnia Magna log bioconcentration factor 3.7845 (*)
Environmental: Degradation studies : biodegradated by white rot fungus (Proc.Annu.Meet.Am.Wood-Preserv.Assoc.1989) May be utilised by axenic cultures of microorganisms e.g. Pseudomonas pancimobilis EPA505, which may have novel degradative systems(Mueller,J.G. et al ppl.Environ.Microbiol.1990; Mueller, J.G. et al Environ.Sci.Technol.1991).
Physical: Not found.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 218-01-9: waste number U050.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 218-01-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 218-01-9: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313

This material contains Chrysene (CAS# 218-01-9, 98%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
CAS# 218-01-9 is listed as a Priority Pollutant under the Clean Water Act.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 218-01-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Chrysene, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 218-01-9: 0.35 æg/day NSRL (oral)

European / International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 45 May cause cancer.
R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 53 Avoid exposure - obtain special instructions before use.
S 60 This material and its container must be disposed of as hazardou s waste.

S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 218-01-9: No information available.

Canada - DSL/NDSL

CAS# 218-01-9 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2A.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 218-01-9 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 6/30/1999
Revision #4 Date: 10/03/2005

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 event shall Fisher 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 Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet

Fluoranthene, 98%

ACC# 80991

Section 1 - Chemical Product and Company Identification

MSDS Name: Fluoranthene, 98%
Catalog Numbers: AC119170000, AC119170250, AC119171000, AC119175000
Synonyms: 1,2-(1,8-Naphthalenediyl)benzene; 1,2-(1,8-Naphthylene)benzene; 1,2-Benzacenaphthene; Benzene, 1,2-(1,8-naphthylene)-; Benzo(j,k)fluorene; Benzo(jk)fluoranthene; Benzo(jk)fluorene
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
206-44-0	Fluoranthene	98	205-912-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: yellow needles.
Caution! Harmful. Causes eye and skin irritation and possible burns. May be harmful if absorbed through the skin. May be harmful if swallowed. May cause heart and liver injury.
Target Organs: Heart, liver, lungs.

Potential Health Effects

Eye: Causes eye irritation and possible burns.
Skin: May be harmful if absorbed through the skin. Causes severe skin irritation and possible burns.
Ingestion: May be harmful if swallowed. May cause rapid heartbeat and cardiac arrythmias. May cause liver injury, pulmonary edema, and respiratory arrest. May cause gastrointestinal disturbances such as nausea.
Inhalation: May cause effects similar to those described for ingestion. May produce cardiac failure and pulmonary edema.
Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the

upper and lower eyelids. Get medical aid imme diately. Do NOT allow victim to rub eyes or keep eyes closed. Extensiv e irrigation with water is required (at least 30 minutes).
Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Remove contaminated clothing and shoes.
Ingestion: Never give anything by mouth to an unconscious person. Get medical aid immediately. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

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. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
Extinguishing Media: In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam.
Flash Point: Not applicable.
Autoignition Temperature: Not applicable.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 2; Flammability: 0; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: 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. Use only in a well-ventilated area. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale. Use only in a chemical fume hood. Do not breathe dust.
Storage: Keep containers tightly closed. Store in a cool, dry 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

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Fluoranthene	none listed	none listed	none listed

OSHA Vacated PELs: Fluoranthene: No OSHA Vacated PELs are listed for this chemical.
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 and clothing 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: Needles
Appearance: yellow
Odor: None reported.
pH: Not available.
Vapor Pressure: 0.01 mm Hg @ 20 deg C
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 384 deg C @ 760.00mmHg
Freezing/Melting Point:107.00 - 110.00 deg C
Decomposition Temperature: Not available.
Solubility: insoluble
Specific Gravity/Density:1.252 g/cm3
Molecular Formula:C16H10
Molecular Weight:202.25

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.
Conditions to Avoid: Incompatible materials, strong oxidants.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, acrid smoke and fumes.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 206-44-0: LL4025000
LD50/LC50:
CAS# 206-44-0:
Oral, rat: LD50 = 2 gm/kg;

Skin, rabbit: LD50 = 3180 mg/kg;

.

Carcinogenicity:
CAS# 206-44-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: IARC Group 3: Limited or insufficient evidence for carcinogenicity in both animals and humans.Experimental tumorigenic data has been reported.
Teratogenicity: No information found
Reproductive Effects: No information found
Mutagenicity: Mutation in microorganisms: Salmonella typhimurium = 5ug/plate.Mutation in mammalian somatic cells: Human Lymphocyte = 2 umol/L.
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Bluegill/Sunfish: 3980 um/L; 96 H; (not specified) No data available.
Environmental: Remains in the upper few cm of soil, but can be transported to groundwater. Biodegrades from soil in a few years. Will not volatilize from soil or water. Rapidly absorbed to sediment and particulates and will readily bioconcentrate. Unadsorbed substance in water will degrade by photolysis in a days to weeks. Stable in sediment for decades or more. In the atmostphere, photodegrades with half life of 4 - 5 days, but may transport long distances without settling or raining out.
Physical: No information available.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 206-44-0: waste number U120.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 206-44-0 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 206-44-0: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 206-44-0: immediate.

Section 313

This material contains Fluoranthene (CAS# 206-44-0, 98%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
CAS# 206-44-0 is listed as a Priority Pollutant under the Clean Water Act. CAS# 206-44-0 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 206-44-0 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 21/22 Harmful in contact with skin and if swallowed.

Safety Phrases:

S 22 Do not breathe dust.
S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 206-44-0: No information available.

Canada - DSL/NDSL

CAS# 206-44-0 is listed on Canada's NDSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 206-44-0 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 9/02/1997
Revision #5 Date: 10/03/2005

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 event shall Fisher 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 Fisher has been advised of the possibility of such damages.

MSDS Number: **L2347** * * * * * *Effective Date:* ***08/10/04*** * * * * * *Supercedes:* ***11/02/01***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

LEAD METAL

1. Product Identification

Synonyms: Granular lead, pigment metal; C.I. 77575
CAS No.: 7439-92-1
Molecular Weight: 207.19
Chemical Formula: Pb
Product Codes:
J.T. Baker: 2256, 2266
Mallinckrodt: 5668

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Lead	7439-92-1	95 - 100%	Yes

3. Hazards Identification

Emergency Overview

POISON! DANGER! MAY BE FATAL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. NEUROTOXIN. AFFECTS THE GUM TISSUE, CENTRAL NERVOUS SYSTEM, KIDNEYS, BLOOD AND REPRODUCTIVE SYSTEM. POSSIBLE CANCER HAZARD. MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends on duration and level of exposure.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Life)
Flammability Rating: 0 - None
Reactivity Rating: 0 - None
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; PROPER GLOVES
Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:

Lead can be absorbed through the respiratory system. Local irritation of bronchia and lungs can occur and, in cases of acute exposure, symptoms such as metallic taste, chest and abdominal pain, and increased lead blood levels may follow. See also Ingestion.
Ingestion:
POISON! The symptoms of lead poisoning include abdominal pain and spasms, nausea, vomiting, headache. Acute poisoning can lead to muscle weakness, "lead line" on the gums, metallic taste, definite loss of appetite, insomnia, dizziness, high lead levels in blood and urine with shock, coma and death in extreme cases.
Skin Contact:
Lead and lead compounds may be absorbed through the skin on prolonged exposure; the symptoms of lead poisoning described for ingestion exposure may occur. Contact over short periods may cause local irritation, redness and pain.
Eye Contact:
Absorption can occur through eye tissues but the more common hazards are local irritation or abrasion.
Chronic Exposure:
Lead is a cumulative poison and exposure even to small amounts can raise the body's content to toxic levels. The symptoms of chronic exposure are like those of ingestion poisoning; restlessness, irritability, visual disturbances, hypertension and gray facial color may also be noted.
Aggravation of Pre-existing Conditions:
Persons with pre-existing kidney, nerve or circulatory disorders or with skin or eye problems may be more susceptible to the effects of this substance.

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4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
Skin Contact:
Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

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5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard. Powder/dust is flammable when heated or exposed to flame.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire. Do not allow water runoff to enter sewers or waterways.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Can produce toxic lead fumes at elevated temperatures and also react with oxidizing materials.

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6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

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7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Areas in which exposure to lead

metal or lead compounds may occur should be identified by signs or appropriate means, and access to the area should be limited to authorized persons. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

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8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
For lead, metal and inorganic dusts and fumes, as Pb:
-OSHA Permissible Exposure Limit (PEL): 0.05 mg/m3 (TWA)
For lead, elemental and inorganic compounds, as Pb:
-ACGIH Threshold Limit Value (TLV): 0.05 mg/m3 (TWA), A3 animal carcinogen
ACGIH Biological Exposure Indices (BEI): 30 ug/100ml, notation B (see actual Indices for more information).
For lead, inorganic:
-NIOSH Recommended Exposure Limit (REL): 0.1 mg/m3 (TWA)
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a half-face high efficiency particulate respirator (NIOSH type N100 filter) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece high efficiency particulate respirator (NIOSH type N100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
Eye Protection:
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.
Other Control Measures:
Eating, drinking, and smoking should not be permitted in areas where solids or liquids containing lead compounds are handled, processed, or stored. See OSHA substance-specific standard for more information on personal protective equipment, engineering and work practice controls, medical surveillance, record keeping, and reporting requirements. (29 CFR 1910.1025).

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9. Physical and Chemical Properties

Appearance:
Small, white to blue-gray metallic shot or granules.
Odor:
Odorless.
Solubility:
Insoluble in water.
Density:
11.34
pH:
No information found.
% Volatiles by volume @ 21C (70F):
0
Boiling Point:
1740C (3164F)
Melting Point:
327.5C (622F)
Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
1.77 @ 1000C (1832F)
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
Does not decompose but toxic lead or lead oxide fumes may form at elevated temperatures.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Ammonium nitrate, chlorine trifluoride, hydrogen peroxide, sodium azide, zirconium, disodium acetylide, sodium acetylide and oxidants.
Conditions to Avoid:
Heat, flames, ignition sources and incompatibles.

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11. Toxicological Information

Toxicological Data:
Investigated as a tumorigen, mutagen, reproductive effector.
Reproductive Toxicity:
Lead and other smelter emissions are human reproductive hazards. (Chemical Council on

Environmental Quality; Chemical Hazards to Human Reproduction, 1981).
Carcinogenicity:
EPA / IRIS classification: Group B2 - Probable human carcinogen, sufficient animal evidence.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Lead (7439-92-1)	No	No	2B

12. Ecological Information

Environmental Fate:
When released into the soil, this material is not expected to leach into groundwater. This material may bioaccumulate to some extent.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

Ingredient	TSCA	EC	Japan	Australia
Lead (7439-92-1)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\----------

	--Canada--

Ingredient	Korea	DSL	NDSL	Phil.
Lead (7439-92-1)	Yes	Yes	No	Yes

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Lead (7439-92-1)	No	No	Yes	No

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Lead (7439-92-1)	10	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Pure / Solid)

WARNING:
THIS PRODUCT CONTAINS CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

Australian Hazchem Code: None allocated.
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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16. Other Information

NFPA Ratings: Health: **3** Flammability: **1** Reactivity: **0**
Label Hazard Warning:
POISON! DANGER! MAY BE FATAL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. NEUROTOXIN. AFFECTS THE GUM TISSUE, CENTRAL NERVOUS SYSTEM, KIDNEYS, BLOOD AND REPRODUCTIVE SYSTEM. POSSIBLE CANCER HAZARD. MAY CAUSE CANCER BASED ON ANIMAL DATA. Risk of cancer depends on duration and level of exposure.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe dust.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Label First Aid:
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not

breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.

Product Use:
Laboratory Reagent.

Revision Information:
No Changes.

Disclaimer:
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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **M1599** * * * * * *Effective Date:* ***12/19/05*** * * * * * *Supercedes:* ***08/10/04***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

MERCURY

1. Product Identification

Synonyms: Quicksilver; hydrargyrum; Liquid Silver
CAS No.: 7439-97-6
Molecular Weight: 200.59
Chemical Formula: Hg
Product Codes:
J.T. Baker: 2564, 2567, 2569
Mallinckrodt: 1278, 1280, 1288

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Mercury	7439-97-6	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

DANGER! CORROSIVE. CAUSES BURNS TO SKIN, EYES, AND RESPIRATORY TRACT. MAY BE FATAL IF SWALLOWED OR INHALED. HARMFUL IF ABSORBED THROUGH SKIN. AFFECTS THE KIDNEYS AND CENTRAL NERVOUS SYSTEM. MAY CAUSE ALLERGIC SKIN REACTION.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Life)
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 3 - Severe (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation:
Mercury vapor is highly toxic via this route. Causes severe respiratory tract damage. Symptoms include sore throat, coughing, pain, tightness in chest, breathing difficulties, shortness of breath, headache, muscle weakness, anorexia, gastrointestinal disturbance, ringing in the ear, liver changes, fever, bronchitis and pneumonitis. Can be absorbed through inhalation with symptoms similar to ingestion.

Ingestion:
May cause burning of the mouth and pharynx, abdominal pain, vomiting, corrosive ulceration, bloody diarrhea. May be followed by a rapid and weak pulse, shallow breathing, paleness, exhaustion, tremors and collapse. Delayed death may occur from renal failure. Gastrointenstinal uptake of mercury is less than 5% but its ability to penetrate tissues presents some hazard. Initial symptoms may be thirst, possible abdominal discomfort.

Skin Contact:
Causes irritaton and burns to skin. Symptoms include redness and pain. May cause skin allergy and sensitization. Can be absorbed through the skin with symptoms to parallel ingestion.

Eye Contact:
Causes irritation and burns to eyes. Symptoms include redness, pain, blurred vision; may cause serious and permanent eye damage.

Chronic Exposure:
Chronic exposure through any route can produce central nervous system damage. May cause muscle tremors, personality and behavior changes, memory loss, metallic taste, loosening of the teeth, digestive disorders, skin rashes, brain damage and kidney damage. Can cause skin allergies and accumulate in the body. Repeated skin contact can cause the skin to turn gray in color. A suspected reproductive hazard; may damage the developing fetus and decrease fertility in males and females.

Aggravation of Pre-existing Conditions:
Persons with nervous disorders, or impaired kidney or respiratory function, or a history of allergies or a known sensitization to mercury may be more susceptible to the effects of the substance.

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

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5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire. Do not allow water runoff to enter sewers or waterways.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Undergoes hazardous reactions in the presence of heat and sparks or ignition. Smoke may contain toxic mercury or mercuric oxide. Smoke may contain toxic mercury or mercuric oxide.

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6. Accidental Release Measures

Ventilate area of leak or spill. Clean-up personnel require protective clothing and respiratory protection from vapor.

Spills: Pick up and place in a suitable container for reclamation or disposal in a method that does not generate misting. Sprinkle area with sulfur or calcium polysulfide to suppress mercury. Do not flush to sewer. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker CINNASORB® and RESISORB® are recommended for spills of this product.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Do not use or store on porous work surfaces (wood, unsealed concrete, etc.). Follow strict hygiene practices. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
- OSHA Acceptable Ceiling Concentration:
mercury and mercury compounds: 0.1 mg/m3 (TWA), skin
- ACGIH Threshold Limit Value (TLV):
inorganic and metallic mercury, as Hg: 0.025 mg/m3 (TWA) skin, A4 Not classifiable as a human carcinogen.
- ACGIH Biological Exposure Indices:
total inorganic mercury in urine (preshift): 35 ug/g creatinine;
total inorganic mercury in blood (end of shift): 15 ug/l.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a half-face respirator with a mercury vapor or chlorine gas cartridge may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece respirator with a mercury vapor or chlorine gas cartridge may be worn up to 50 times the exposure limit, or the maximum use concentraiton specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Silver-white, heavy, mobile, liquid metal.
Odor:
Odorless.
Solubility:
Insoluble in water.
Density:
13.55
pH:
No information found.
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
356.7C (675F)
Melting Point:
-38.87C (-38F)
Vapor Density (Air=1):
7.0
Vapor Pressure (mm Hg):
0.0018 @ 25C (77F)
Evaporation Rate (BuAc=1):
4

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10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
At high temperatures, vaporizes to form extremely toxic fumes.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Acetylenes, ammonia, ethylene oxide, chlorine dioxide, azides, metal oxides, methyl silane, lithium, rubidium, oxygen, strong oxidants, metal carbonyls.
Conditions to Avoid:
Heat, flames, ignition sources, metal surfaces and incompatibles.

---

11. Toxicological Information

Toxicological Data:
Investigated as a tumorigen, mutagen, reproductive effector.
Reproductive Toxicity:
All forms of mercury can cross the placenta to the fetus, but most of what is known has

been learned from experimental animals. See Chronic Health Hazards.
Carcinogenicity:
EPA / IRIS classification: Group D1 - Not classifiable as a human carcinogen.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Mercury (7439-97-6)	No	No	3

12. Ecological Information

Environmental Fate:
This material has an experimentally-determined bioconcentration factor (BCF) of greater than 100. This material is expected to significantly bioaccumulate.
Environmental Toxicity:
This material is expected to be toxic to aquatic life. The LC50/96-hour values for fish are less than 1 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: RQ, MERCURY
Hazard Class: 8
UN/NA: UN2809
Packing Group: III
Information reported for product/size: 1LB

International (Water, I.M.O.)

Proper Shipping Name: MERCURY
Hazard Class: 8
UN/NA: UN2809
Packing Group: III
Information reported for product/size: 1LB

International (Air, I.C.A.O.)

Proper Shipping Name: MERCURY
Hazard Class: 8
UN/NA: UN2809
Packing Group: III
Information reported for product/size: 1LB

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15. Regulatory Information

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--------\Chemical Inventory Status - Part 1\---------------------------------
Ingredient                                    TSCA  EC   Japan  Australia
--------------------------------------------  ----  ---  -----  ---------
Mercury (7439-97-6)                            Yes  Yes   No       Yes

--------\Chemical Inventory Status - Part 2\---------------------------------
                                                      --Canada--
Ingredient                                    Korea  DSL   NDSL  Phil.
--------------------------------------------  -----  ---   ----  -----
Mercury (7439-97-6)                            Yes   Yes   No     Yes

--------\Federal, State & International Regulations - Part 1\----------------
                                          -SARA 302-    ------SARA 313------
Ingredient                                RQ    TPQ     List  Chemical Catg.
----------------------------------------  ---   -----   ----  --------------
Mercury (7439-97-6)                       No    No      Yes        No

--------\Federal, State & International Regulations - Part 2\----------------
                                                      -RCRA-    -TSCA-
Ingredient                                CERCLA      261.33     8(d)
----------------------------------------  ------      ------    ------
Mercury (7439-97-6)                       1           U151       No


Chemical Weapons Convention:  No     TSCA 12(b):  No     CDTA:  No
SARA 311/312:  Acute: Yes      Chronic: Yes  Fire: No  Pressure: No
Reactivity: No          (Pure / Liquid)
```

WARNING:
THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

Australian Hazchem Code: 2Z
Poison Schedule: S7
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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16. Other Information

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **0**
Label Hazard Warning:
DANGER! CORROSIVE. CAUSES BURNS TO SKIN, EYES, AND RESPIRATORY TRACT. MAY BE FATAL IF SWALLOWED OR INHALED. HARMFUL IF ABSORBED THROUGH SKIN. AFFECTS THE KIDNEYS AND CENTRAL NERVOUS SYSTEM. MAY CAUSE ALLERGIC SKIN REACTION.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Label First Aid:
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases get medical attention immediately.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 3.
Disclaimer:
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****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

Material Safety Data Sheet

Phenanthrene, 90%

ACC# 59921

Section 1 - Chemical Product and Company Identification

MSDS Name: Phenanthrene, 90%
Catalog Numbers: AC130100000, AC130100010, AC130102500
Synonyms:
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
85-01-8	Phenanthrene	90.0	201-581-5

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: brown solid.
Caution! Powdered material may form explosive dust-air mixtures. May cause allergic skin reaction. May cause eye and skin irritation. May cause respiratory tract irritation. Cancer suspect agent.
Target Organs: None.

Potential Health Effects

Eye: May cause eye irritation.
Skin: May cause skin irritation. May cause photosensitive skin reactions in certain individuals.
Ingestion: May cause irritation of the digestive tract.
Inhalation: Inhalation of dust may cause respiratory tract irritation.
Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid imme diately.
Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
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.

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. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
Extinguishing Media: Use water spray or dry chemical.
Flash Point: Not available.
Autoignition Temperature: Not available.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 1; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: 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. Do not let this chemical enter the environment.

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. Keep container tightly closed. Avoid ingestion and inhalation.
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: Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Phenanthrene	0.2 mg/m3 TWA (as benzene soluble aerosol) (listed under Coal tar pitches).	0.1 mg/m3 TWA (cyclohexane-extractable fraction) (listed under Coal tar pitches).80 mg/m3 IDLH (listed under Coal tar pitches).	0.2 mg/m3 TWA (as benzene soluble fraction) (listed under Coal tar pitches).

OSHA Vacated PELs: Phenanthrene: No OSHA Vacated PELs are listed for this chemical.

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: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Solid
Appearance: brown
Odor: none reported
pH: Not available.
Vapor Pressure: 1 mm Hg @116c
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 340 deg C
Freezing/Melting Point:101 deg C
Decomposition Temperature: Not available.
Solubility: insoluble
Specific Gravity/Density:1.0630g/cm3
Molecular Formula:C14H10
Molecular Weight:178.23

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.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:
CAS# 85-01-8: SF7175000
LD50/LC50:
CAS# 85-01-8:
Oral, mouse: LD50 = 700 mg/kg;
Oral, rat: LD50 = 1.8 gm/kg;
.

Carcinogenicity:
CAS# 85-01-8:

- **ACGIH:** A1 - Confirmed Human Carcinogen (as benzene soluble aerosol) (listed as 'Coal tar pitches').
- **California:** Not listed.
- **NTP:** Known carcinogen (listed as Coal tar pitches).
- **IARC:** Group 1 carcinogen (listed as Coal tar pitches).

Epidemiology: No data available.
Teratogenicity: No data available.
Reproductive Effects: No data available.
Mutagenicity: No data available.
Neurotoxicity: No data available.
Other Studies:

Section 12 - Ecological Information

No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	Not regulated as a hazardous material	No information available.
Hazard Class:		
UN Number:		
Packing Group:		

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 85-01-8 is listed on the TSCA inventory.
Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 85-01-8: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 85-01-8: immediate.

Section 313

This material contains Phenanthrene (CAS# 85-01-8, 90.0%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
CAS# 85-01-8 is listed as a Priority Pollutant under the Clean Water Act.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 85-01-8 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, (listed as Coal tar pitches), Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European / International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 45 May cause cancer.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 85-01-8: No information available.

Canada - DSL/NDSL

CAS# 85-01-8 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D2B.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 85-01-8 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 7/14/1998
Revision #3 Date: 10/03/2005

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 event shall Fisher 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 Fisher has been advised of the possibility of such damages.

Health	3
Fire	1
Reactivity	2
Personal Protection	E

Material Safety Data Sheet
Arsenic MSDS

Section 1: Chemical Product and Company Identification

Product Name: Arsenic

Catalog Codes: SLA1006

CAS#: 7440-38-2

RTECS: CG0525000

TSCA: TSCA 8(b) inventory: Arsenic

CI#: Not applicable.

Synonym:

Chemical Name: Arsenic

Chemical Formula: As

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Arsenic	7440-38-2	100

Toxicological Data on Ingredients: Arsenic: ORAL (LD50): Acute: 763 mg/kg [Rat]. 145 mg/kg [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant), of eye contact (irritant).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance is toxic to kidneys, lungs, the nervous system, mucous membranes.
Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Flammable in presence of open flames and sparks, of heat, of oxidizing materials.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:
Material in powder form, capable of creating a dust explosion. When heated to decomposition it emits highly toxic fumes.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Be careful that the product is not

present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, acids, moisture.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.01 from ACGIH (TLV) [United States] [1995]
Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Lustrous solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 74.92 g/mole

Color: Silvery.

pH (1% soln/water): Not applicable.

Boiling Point: Not available.

Melting Point: Sublimation temperature: 615°C (1139°F)

Critical Temperature: Not available.

Specific Gravity: 5.72 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water, hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Reactive with oxidizing agents, acids, moisture.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 145 mg/kg [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH.
Causes damage to the following organs: kidneys, lungs, the nervous system, mucous membranes.

Other Toxic Effects on Humans:
Very hazardous in case of ingestion, of inhalation.
Slightly hazardous in case of skin contact (irritant).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Arsenic UNNA: UN1558 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Arsenic
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Arsenic
Pennsylvania RTK: Arsenic
Massachusetts RTK: Arsenic
TSCA 8(b) inventory: Arsenic

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R22- Harmful if swallowed.
R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 1

Reactivity: 2

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 1

Reactivity: 2

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Safety glasses.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.
-Liste des produits purs tératogènes, mutagènes, cancérogènes. Répertoire toxicologique de la Commission de la Santé et de la Sécurité du Travail du Québec.
-Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec.
-SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984.
-The Sigma-Aldrich Library of Chemical Safety Data, Edition II.
-Guide de la loi et du règlement sur le transport des marchandises dangeureuses au canada. Centre de conformité internatinal Ltée. 1986.

Other Special Considerations: Not available.

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Last Updated: 10/09/2005 04:16 PM

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Health	2
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Nickel metal MSDS

Section 1: Chemical Product and Company Identification

Product Name: Nickel metal

Catalog Codes: SLN2296, SLN1342, SLN1954

CAS#: 7440-02-0

RTECS: QR5950000

TSCA: TSCA 8(b) inventory: Nickel metal

CI#: Not applicable.

Synonym: Nickel Metal shot; Nickel metal foil.

Chemical Name: Nickel

Chemical Formula: Ni

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Nickel metal	7440-02-0	100

Toxicological Data on Ingredients: Nickel metal LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant, sensitizer), of eye contact (irritant), of ingestion.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer), of ingestion, of inhalation (lung sensitizer).
CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. Classified 2 (Some evidence.) by NTP.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance is toxic to skin.
The substance may be toxic to kidneys, lungs, liver, upper respiratory tract.
Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable solid.
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards: Material in powder form, capable of creating a dust explosion. This material is flammable in powder form only.

Special Remarks on Explosion Hazards:
Material in powder form, capable of creating a dust explosion.
Mixtures containing Potassium Perchlorate with Nickel & Titanium powders & infusorial earth can explode.
Adding 2 or 3 drops of approximately 90% peroxyformic acid to powdered nickel will result in explosion.
Powdered nickel reacts explosively upon contact with fused ammonium nitrate at temperatures below 200 deg. C.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, seek medical attention and show the label when possible. Keep away from incompatibles such as oxidizing agents, combustible materials, metals, acids.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 1 (mg/m3) from ACGIH (TLV) [United States] Inhalation Respirable.
TWA: 0.5 (mg/m3) [United Kingdom (UK)]
TWA: 1 (mg/m3) from OSHA (PEL) [United States] InhalationConsult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Metal solid. Lustrous solid.)

Odor: Odorless.

Taste: Not available.

Molecular Weight: 58.71 g/mole

Color: Silvery.

pH (1% soln/water): Not applicable.

Boiling Point: 2730°C (4946°F)

Melting Point: 1455°C (2651°F)

Critical Temperature: Not available.

Specific Gravity: Density: 8.908 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Insoluble in cold water, hot water.
Insoluble in Ammonia.
Soluble in dilute Nitric Acid.
Slightly soluble in Hydrochloric Acid, Sulfuric Acid.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, combustible materials, metals, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Incompatible with strong acids, selenium, sulfur, wood and other combustibles, nickel nitrate, aluminum, aluminum trichloride, ethylene, p-dioxan, hydrogen, methanol, non-metals, oxidants, sulfur compounds, aniline, hydrogen sulfide, flammable solvents, hydrazine, and metal powders (especially zinc, aluminum, and magnesium), ammonium nitrate, nitryl fluoride, bromine pentafluoride, potassium perchlorate + titanium powder + indusorial earth.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available.
LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. Classified 2 (Some evidence.) by NTP.
Causes damage to the following organs: skin.
May cause damage to the following organs: kidneys, lungs, liver, upper respiratory tract.

Other Toxic Effects on Humans:

Hazardous in case of inhalation.
Slightly hazardous in case of skin contact (irritant, sensitizer), of ingestion.

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose/Conc:
LDL [Rat] - Route: Oral; Dose: 5000 mg/kg
LDL [Guinea Pig] - Route: Oral; Dose: 5000 mg/kg

Special Remarks on Chronic Effects on Humans: May cause cancer based on animal test data

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:
Skin: Nickel dust and fume can irritate skin.
Eyes: Nickel dust and fume can irritate eyes.
Inhalation: Inhalation of dust or fume may cause respiratory tract irritation with non-productive cough, hoarseness, sore throat, headache, vertigo, weakness, chest pain, followed by delayed effects, including tachypnea, dyspnea, and ARDS. Death due to ARDS has been reported following inhalation of high concentrations of respirable metallic nickel dust. Later effects may include pulmonary edema and fibrosis.
Ingestion: Metallic nickel is generally considered not to be acutely toxic if ingested. Ingestion may cause nausea, vomiting, abdominal , and diarrhea. Nickel may damage the kidneys(proteinuria), and may affect liver function. It may also affect behavior (somnolence), and cardiovascular system (increased cornary artery resistance, decreased myocardial contractility, myocardial damage, regional or general arteriolar or venus dilation).
Chronic Potential Health Effects:
Skin: May cause skin allergy. Nickel and nickel compounds are among the most common sensitizers inducing allergic contact dermatitis.
Inhalation: Chronic inhalation nickel dust or fume can cause chronic hypertrophic rhinitis, sinusitis, nasal polyps, perforation of the nasal septum, chronic pulmonary irritation, fibrosis, pulmonary edema, pulmonary eosinophilia, Pneumoconiosis, allergies (asthma-like allergy), and cancer of the nasal sinus cavities, lungs, and possibly other organs. Future exposures can cause asthma attacks with shortness of breath, wheezing, cough, and/or chest tightness. Chronic inhalation of nickel dust or fume may also affect the liver (impaired liver function tests), and blood (changes in red blood cell count).
Ingestion: Prolonged or repeated ingestion of nickel can be a source chronic urticaria and other signs of allergy. Chronic ingestion of NIckel may also affect respiration and cause pneumoconiosis or fibrosis.
Note: In the general population, sensitization occurs from exposure to nickel-containing coins, jewelry, watches,

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Nickel metal
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Nickel metal
Connecticut hazardous material survey.: Nickel metal
Illinois toxic substances disclosure to employee act: Nickel metal
Illinois chemical safety act: Nickel metal
New York release reporting list: Nickel metal
Rhode Island RTK hazardous substances: Nickel metal
Pennsylvania RTK: Nickel metal
Michigan critical material: Nickel metal
Massachusetts RTK: Nickel metal
Massachusetts spill list: Nickel metal
New Jersey: Nickel metal
New Jersey spill list: Nickel metal
Louisiana spill reporting: Nickel metal
California Director's List of Hazardous Substances: Nickel metal
TSCA 8(b) inventory: Nickel metal

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R40- Possible risks of irreversible effects.
R43- May cause sensitization by skin contact.
S22- Do not breathe dust.
S36- Wear suitable protective clothing.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:42 PM

Last Updated: 10/10/2005 08:42 PM

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Health	3
Fire	3
Reactivity	2
Personal Protection	J

Material Safety Data Sheet
Calcium MSDS

Section 1: Chemical Product and Company Identification

Product Name: Calcium

Catalog Codes: SLC2782

CAS#: 7440-70-2

RTECS: EV8040000

TSCA: TSCA 8(b) inventory: Calcium

CI#: Not available.

Synonym:

Chemical Formula: Ca

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Calcium	7440-70-2	100

Toxicological Data on Ingredients: Calcium LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Corrosive to eyes and skin. The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over-exposure can produce lung damage, choking, unconsciousness or death.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance is toxic to lungs, mucous membranes.
Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.

Skin Contact:
If the chemical got onto the clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower. If the chemical got on the victim's exposed skin, such as the hands : Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable solid.
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray or fog.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Corrosive solid. Flammable solid that, in contact with water, emits flammable gases.
Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Cover with dry earth, sand or other non-combustible material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal.

Section 7: Handling and Storage

Precautions:
Keep under inert atmosphere. Keep container dry. Do not breathe dust. Never add water to this product Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If you feel unwell, seek medical attention and show the label when possible. Avoid contact with skin and eyes Keep away from incompatibles such as acids, moisture.

Storage:
Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. Keep container dry. Keep in a cool place.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor and dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 40.08 g/mole

Color: Not available.

pH (1% soln/water): Not available.

Boiling Point: 1484°C (2703.2°F)

Melting Point: 839°C (1542.2°F)

Critical Temperature: Not available.

Specific Gravity: 1.54 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Not available.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances:
Highly reactive with acids.
Reactive with moisture.
The product reacts violently with water to emit flammable but non toxic gases.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available.
LC50: Not available.

Chronic Effects on Humans: The substance is toxic to lungs, mucous membranes.

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 4.3: Material that emits flammable gases on contact with water.

Identification: : Calcium : UN1401 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Pennsylvania RTK: Calcium
Massachusetts RTK: Calcium
TSCA 8(b) inventory: Calcium

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS B-6: Reactive and very flammable material.
CLASS E: Corrosive solid.

DSCL (EEC): R36/38- Irritating to eyes and skin.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 3

Reactivity: 2

Personal Protection: j

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 3

Reactivity: 2

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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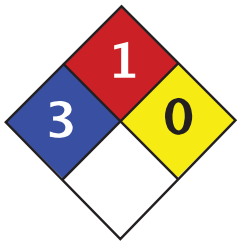

Health	3
Fire	1
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Cadmium MSDS

Section 1: Chemical Product and Company Identification

Product Name: Cadmium

Catalog Codes: SLC3484, SLC5272, SLC2482

CAS#: 7440-43-9

RTECS: EU9800000

TSCA: TSCA 8(b) inventory: Cadmium

CI#: Not applicable.

Synonym:

Chemical Name: Cadmium

Chemical Formula: Cd

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Cadmium	7440-43-9	100

Toxicological Data on Ingredients: Cadmium: ORAL (LD50): Acute: 2330 mg/kg [Rat.]. 890 mg/kg [Mouse]. DUST (LC50): Acute: 50 ppm 4 hour(s) [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, sensitizer), of eye contact (irritant). Severe over-exposure can result in death.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A2 (Suspected for human.) by ACGIH, 2 (Reasonably anticipated.) by NTP.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance is toxic to kidneys, lungs, liver.
Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact: No known effect on eye contact, rinse with water for a few minutes.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact: Not available.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 570°C (1058°F)

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances:
Non-flammable in presence of open flames and sparks, of heat, of oxidizing materials, of reducing materials, of combustible materials, of moisture.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:
Material in powder form, capable of creating a dust explosion. When heated to decomposition it emits toxic fumes.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Highly toxic or infectious materials should be stored in a separate locked safety storage cabinet or room.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.01 (ppm)
Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Lustrous solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 112.4 g/mole

Color: Silvery.

pH (1% soln/water): Not applicable.

Boiling Point: 765°C (1409°F)

Melting Point: 320.9°C (609.6°F)

Critical Temperature: Not available.

Specific Gravity: 8.64 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water, hot water, methanol, diethyl ether, n-octanol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Not considered to be corrosive for metals and glass.

Special Remarks on Reactivity: Reacts violently with potassium.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE.
Acute oral toxicity (LD50): 890 mg/kg [Mouse].
Acute toxicity of the dust (LC50): 229.9 mg/m3 4 hour(s) [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A2 (Suspected for human.) by ACGIH, 2 (Reasonably anticipated.) by NTP.
The substance is toxic to kidneys, lungs, liver.

Other Toxic Effects on Humans:
Hazardous in case of ingestion, of inhalation.
Slightly hazardous in case of skin contact (irritant, sensitizer).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: An allergen. 0047 Animal: embryotoxic, passes through the placental barrier.

Special Remarks on other Toxic Effects on Humans: May cause allergic reactions, exzema and/or dehydration of the skin.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification:

Identification:

Special Provisions for Transport:

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Cadmium
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Cadmium
Pennsylvania RTK: Cadmium
Massachusetts RTK: Cadmium
TSCA 8(b) inventory: Cadmium
SARA 313 toxic chemical notification and release reporting: Cadmium
CERCLA: Hazardous substances.: Cadmium

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R26- Very toxic by inhalation.
R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Safety glasses.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.
-Liste des produits purs tératogènes, mutagènes, cancérogènes. Répertoire toxicologique de la Commission de la Santé et de la Sécurité du Travail du Québec.
-Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec.
-SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984.
-The Sigma-Aldrich Library of Chemical Safety Data, Edition II.
-Guide de la loi et du règlement sur le transport des marchandises dangeureuses au canada. Centre de conformité internatinal Ltée. 1986.

Other Special Considerations: Not available.

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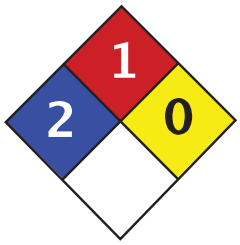

Health	2
Fire	1
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Copper MSDS

Section 1: Chemical Product and Company Identification

Product Name: Copper

Catalog Codes: SLC4939, SLC2152, SLC3943, SLC1150, SLC2941, SLC4729, SLC1936, SLC3727, SLC5515

CAS#: 7440-50-8

RTECS: GL5325000

TSCA: TSCA 8(b) inventory: Copper

CI#: Not available.

Synonym:

Chemical Name: Not available.

Chemical Formula: Cu

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Copper	7440-50-8	100

Toxicological Data on Ingredients: Copper LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of ingestion. Hazardous in case of eye contact (irritant), of inhalation. Slightly hazardous in case of skin contact (irritant).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance is toxic to lungs, mucous membranes.
Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact: Not available.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation: Not available.

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not breathe dust. Avoid contact with eyes Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If you feel unwell, seek medical attention and show the label when possible.

Storage:
Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Combustible materials should be stored away from extreme heat and away from strong oxidizing agents.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 1 (mg/m3) from ACGIH [1990]
Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 63.54 g/mole

Color: Not available.

pH (1% soln/water): Not applicable.

Boiling Point: 2595°C (4703°F)

Melting Point: 1083°C (1981.4°F)

Critical Temperature: Not available.

Specific Gravity: 8.94 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available.
LC50: Not available.

Chronic Effects on Humans: The substance is toxic to lungs, mucous membranes.

Other Toxic Effects on Humans:
Very hazardous in case of ingestion.
Hazardous in case of inhalation.
Slightly hazardous in case of skin contact (irritant).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Human: passes through the placenta, excreted in maternal milk.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
Pennsylvania RTK: Copper
Massachusetts RTK: Copper
TSCA 8(b) inventory: Copper
CERCLA: Hazardous substances.: Copper

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC): R36- Irritating to eyes.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator

when ventilation is inadequate.
Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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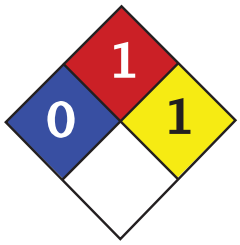

Health	1
Fire	3
Reactivity	2
Personal Protection	E

Material Safety Data Sheet
Magnesium MSDS

Section 1: Chemical Product and Company Identification

Product Name: Magnesium

Catalog Codes: SLM4408, SLM2263, SLM3637

CAS#: 7439-95-4

RTECS: OM2100000

TSCA: TSCA 8(b) inventory: Magnesium

CI#: Not applicable.

Synonym: Magnesium ribbons, turnings or sticks

Chemical Name: Magnesium

Chemical Formula: Mg

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Magnesium	7439-95-4	100

Toxicological Data on Ingredients: Magnesium LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at

least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances:
Highly flammable in presence of open flames and sparks, of heat.
Flammable in presence of acids, of moisture.
Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.
Explosive in presence of acids, of moisture.

Fire Fighting Media and Instructions:
Flammable solid.
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards:
Magnesium turnings, chips or granules, ribbons, are flammable. They can be easily ignited. They may reignite after fire is extinguished. Produces flammable gases on contact with water and acid. May ignite on contact with water or moist air.
Magnesium fires do not flare up violently unless moisture is present.

Special Remarks on Explosion Hazards: Reacts with acids and water to form hydrogen gas with is highly flammable and eplosive

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Flammable solid.
Stop leak if without risk. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not breathe dust. Keep away from incompatibles such as oxidizing agents, acids, moisture.

Storage:
Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Moisture sensitive. Dangerous when wet.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Metal solid)

Odor: Odorless.

Taste: Not available.

Molecular Weight: 24.31 g/mole

Color: Silver-white

pH (1% soln/water): Not applicable.

Boiling Point: 1100°C (2012°F)

Melting Point: 651°C (1203.8°F)

Critical Temperature: Not available.

Specific Gravity: 1.74 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Very slightly soluble in hot water.
Insoluble in cold water.
Insoluble in chromium trioxides, and mineral acids, alkalies.
Slightly soluble with decomposition in hot water.
Soluble in concentrated hydrogen fluoride, and ammonium salts.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, incompatible materials, water or moisture, moist air.

Incompatibility with various substances: Reactive with oxidizing agents, acids, moisture.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Violent chemical reaction with oxidizing agents.
Reacts with water to create hydrogen gas and heat. Must be kept dry.
Reacts with acids to form hydrogen gas which is highly flammable and explosive.
Magnesium forms hazardous or explosive mixtures with aluminum and potassium perchlorate; ammonium nitrate; barium nitrate, barium dioxide and zinc; beryllium oxide; boron phosphodiiodide; bromobenzyl trifluoride; cadmium cyanide; cadmium oxide; calcium carbide; carbonates; carbon tetrachloride; chlorine; chlorine trifluoride; chloroform; cobalt cyanide; copper cyanide; copper sulfate(anhydrous), ammonium nitrate, potassium chlorate and water; cupric oxide; cupric sulfate; fluorine; gold cyanide; hydrogen and calcium carbonate; hydrogen iodide; hydrogen peroxide; iodine; lead cyanide; mercuric oxide; mercury cyanide; methyl chloride; molybdenum trioxide; nickel cyanide; nitric acid; nitrogen dioxide; oxygen (liquid); performic acid; phosphates; potassium chlorate; potassium perchlorate; silver nitrate; silver oxide; sodium perchlorate; sodium peroxide; sodium peroxide and carbon dioxide; stannic oxide; sulfates; trichloroethylene; zinc cyanide; zinc oxide.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available.
LC50: Not available.

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:
Skin: May cause skin irritation by mechanical action. May get mechanical injury or embedding of chips/particles in skin. The particles that are embedded in the wounds may retard healing.
Eyes: May cause eye irritation by mechanical action. Mechanical injury may occur. Particles or chips may embed in eye and retard healing.
Inhalation: Low hazard for ususal industrial handling. It may cause respiratory tract irritation. However, it is unlikely due to physical form. When Magnesium metal is heated during welding or smelting process, Metal Fume Fever may result from inhalation of magnesium fumes. Metal Fume Fever is a flu-like condition consisting of fever, chills, sweating, aches, pains, cough, weakness, headache, nausea, vomiting, and breathing difficulty. Other symptoms may include metallic taste, increased white blood cell count. There is no permanent ill-effect.
Ingestion: Low hazard for usual industrial handling. There are no known reports of serious industrial poisonings with Magnesium. Ingeston of large amounts of chips, turnings or ribbons may cause gastrointestinal tract irritation with nausea, vomiting, and diarrhea. Acute ingestion may also result in Hypermagnesia. Hypermagnesia may cause hypotension, bradycardia, CNS depression, respiratory depression, and impairment of neuromuscular transmission (hyporeflexia, paralysis).

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 4.1: Flammable solid.

Identification: : Magnesium UNNA: 1869 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Magnesium
Rhode Island RTK hazardous substances: Magnesium
Pennsylvania RTK: Magnesium

Massachusetts RTK: Magnesium
Massachusetts spill list: Magnesium
New Jersey: Magnesium
TSCA 8(b) inventory: Magnesium

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-4: Flammable solid.
CLASS B-6: Reactive and very flammable material.

DSCL (EEC):
R11- Highly flammable.
R15- Contact with water liberates extremely flammable gases.
S7/8- Keep container tightly closed and dry.
S43- In case of fire, use dry chemical. Never use water.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 3

Reactivity: 2

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 0

Flammability: 1

Reactivity: 1

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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Last Updated: 11/06/2008 12:00 PM

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Health	2
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Nickel metal MSDS

Section 1: Chemical Product and Company Identification

Product Name: Nickel metal

Catalog Codes: SLN2296, SLN1342, SLN1954

CAS#: 7440-02-0

RTECS: QR5950000

TSCA: TSCA 8(b) inventory: Nickel metal

CI#: Not applicable.

Synonym: Nickel Metal shot; Nickel metal foil.

Chemical Name: Nickel

Chemical Formula: Ni

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Nickel metal	7440-02-0	100

Toxicological Data on Ingredients: Nickel metal LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant, sensitizer), of eye contact (irritant), of ingestion.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer), of ingestion, of inhalation (lung sensitizer).
CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. Classified 2 (Some evidence.) by NTP.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance is toxic to skin.
The substance may be toxic to kidneys, lungs, liver, upper respiratory tract.
Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable solid.
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards: Material in powder form, capable of creating a dust explosion. This material is flammable in powder form only.

Special Remarks on Explosion Hazards:
Material in powder form, capable of creating a dust explosion.
Mixtures containing Potassium Perchlorate with Nickel & Titanium powders & infusorial earth can explode.
Adding 2 or 3 drops of approximately 90% peroxyformic acid to powdered nickel will result in explosion.
Powdered nickel reacts explosively upon contact with fused ammonium nitrate at temperatures below 200 deg. C.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, seek medical attention and show the label when possible. Keep away from incompatibles such as oxidizing agents, combustible materials, metals, acids.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 1 (mg/m3) from ACGIH (TLV) [United States] Inhalation Respirable.
TWA: 0.5 (mg/m3) [United Kingdom (UK)]
TWA: 1 (mg/m3) from OSHA (PEL) [United States] InhalationConsult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Metal solid. Lustrous solid.)

Odor: Odorless.

Taste: Not available.

Molecular Weight: 58.71 g/mole

Color: Silvery.

pH (1% soln/water): Not applicable.

Boiling Point: 2730°C (4946°F)

Melting Point: 1455°C (2651°F)

Critical Temperature: Not available.

Specific Gravity: Density: 8.908 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:
Insoluble in cold water, hot water.
Insoluble in Ammonia.
Soluble in dilute Nitric Acid.
Slightly soluble in Hydrochloric Acid, Sulfuric Acid.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, combustible materials, metals, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Incompatible with strong acids, selenium, sulfur, wood and other combustibles, nickel nitrate, aluminum, aluminum trichloride, ethylene, p-dioxan, hydrogen, methanol, non-metals, oxidants, sulfur compounds, aniline, hydrogen sulfide, flammable solvents, hydrazine, and metal powders (especially zinc, aluminum, and magnesium), ammonium nitrate, nitryl fluoride, bromine pentafluoride, potassium perchlorate + titanium powder + indusorial earth.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available.
LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 2B (Possible for human.) by IARC. Classified 2 (Some evidence.) by NTP.
Causes damage to the following organs: skin.
May cause damage to the following organs: kidneys, lungs, liver, upper respiratory tract.

Other Toxic Effects on Humans:

Hazardous in case of inhalation.
Slightly hazardous in case of skin contact (irritant, sensitizer), of ingestion.

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose/Conc:
LDL [Rat] - Route: Oral; Dose: 5000 mg/kg
LDL [Guinea Pig] - Route: Oral; Dose: 5000 mg/kg

Special Remarks on Chronic Effects on Humans: May cause cancer based on animal test data

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:
Skin: Nickel dust and fume can irritate skin.
Eyes: Nickel dust and fume can irritate eyes.
Inhalation: Inhalation of dust or fume may cause respiratory tract irritation with non-productive cough, hoarseness, sore throat, headache, vertigo, weakness, chest pain, followed by delayed effects, including tachypnea, dyspnea, and ARDS. Death due to ARDS has been reported following inhalation of high concentrations of respirable metallic nickel dust. Later effects may include pulmonary edema and fibrosis.
Ingestion: Metallic nickel is generally considered not to be acutely toxic if ingested. Ingestion may cause nausea, vomiting, abdominal , and diarrhea. Nickel may damage the kidneys(proteinuria), and may affect liver function. It may also affect behavior (somnolence), and cardiovascular system (increased cornary artery resistance, decreased myocardial contractility, myocardial damage, regional or general arteriolar or venus dilation).
Chronic Potential Health Effects:
Skin: May cause skin allergy. Nickel and nickel compounds are among the most common sensitizers inducing allergic contact dermatitis.
Inhalation: Chronic inhalation nickel dust or fume can cause chronic hypertrophic rhinitis, sinusitis, nasal polyps, perforation of the nasal septum, chronic pulmonary irritation, fibrosis, pulmonary edema, pulmonary eosinophilia, Pneumoconiosis, allergies (asthma-like allergy), and cancer of the nasal sinus cavities, lungs, and possibly other organs. Future exposures can cause asthma attacks with shortness of breath, wheezing, cough, and/or chest tightness. Chronic inhalation of nickel dust or fume may also affect the liver (impaired liver function tests), and blood (changes in red blood cell count).
Ingestion: Prolonged or repeated ingestion of nickel can be a source chronic urticaria and other signs of allergy. Chronic ingestion of NIckel may also affect respiration and cause pneumoconiosis or fibrosis.
Note: In the general population, sensitization occurs from exposure to nickel-containing coins, jewelry, watches,

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Nickel metal
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Nickel metal
Connecticut hazardous material survey.: Nickel metal
Illinois toxic substances disclosure to employee act: Nickel metal
Illinois chemical safety act: Nickel metal
New York release reporting list: Nickel metal
Rhode Island RTK hazardous substances: Nickel metal
Pennsylvania RTK: Nickel metal
Michigan critical material: Nickel metal
Massachusetts RTK: Nickel metal
Massachusetts spill list: Nickel metal
New Jersey: Nickel metal
New Jersey spill list: Nickel metal
Louisiana spill reporting: Nickel metal
California Director's List of Hazardous Substances: Nickel metal
TSCA 8(b) inventory: Nickel metal

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R40- Possible risks of irreversible effects.
R43- May cause sensitization by skin contact.
S22- Do not breathe dust.
S36- Wear suitable protective clothing.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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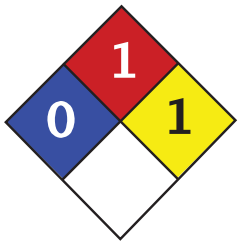

Health	1
Fire	1
Reactivity	1
Personal Protection	E

Material Safety Data Sheet
Zinc Metal MSDS

Section 1: Chemical Product and Company Identification

Product Name: Zinc Metal

Catalog Codes: SLZ1054, SLZ1159, SLZ1267, SLZ1099, SLZ1204

CAS#: 7440-66-6

RTECS: ZG8600000

TSCA: TSCA 8(b) inventory: Zinc Metal

CI#: Not applicable.

Synonym: Zinc Metal Sheets; Zinc Metal Shot; Zinc Metal Strips

Chemical Name: Zinc Metal

Chemical Formula: Zn

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Zinc Metal	7440-66-6	100

Toxicological Data on Ingredients: Zinc Metal LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 480°C (896°F)

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances:
Slightly flammable to flammable in presence of open flames and sparks, of heat, of oxidizing materials, of acids, of alkalis, of moisture.
Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable solid.
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards:
Zinc + NaOH causes ignition.
Oxidation of zinc by potassium proceeds with incandescence.
Residues from zinc dust /acetic acid reduction operations may ignite after long delay if discarded into waste bins with paper.
Incandescent reaction when Zinc and Arsenic or Tellurium, or Selenium are combined.
When hydrazine mononitrate is heated in contact with zinc, a flamming decomposition occurs at temperatures a little above its melting point.
Contact with acids and alkali hydroxides (sodium hydroxide, postasium hydroxide, calcium hydroxide, etc.) results in evolution of hydrogen with sufficient heat of reaction to ignite the hydrogen gas.
Zinc foil ignites if traces of moisture are present.
It is water reactive and produces flammable gases on contact with water. It may ignite on contact with water or

moist air.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Flammable solid that, in contact with water, emits flammable gases.
Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Cover with dry earth, sand or other non-combustible material. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not breathe dust. Keep away from incompatibles such as oxidizing agents, acids, alkalis, moisture.

Storage:
Keep container tightly closed. Keep container in a cool, well-ventilated area. Keep from any possible contact with water. Do not allow water to get into container because of violent reaction.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Lustrous solid. Metal solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 65.39 g/mole

Color: Bluish-grey

pH (1% soln/water): Not applicable.

Boiling Point: 907°C (1664.6°F)

Melting Point: 419°C (786.2°F)

Critical Temperature: Not available.

Specific Gravity: Not available.

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water, hot water, methanol, diethyl ether, n-octanol, acetone.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat, incompatible materials, moisture

Incompatibility with various substances:
Reactive with oxidizing agents, acids, alkalis.
Slightly reactive to reactive with moisture.
The product may react violently with water to emit flammable but non toxic gases.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Incompatible with acids, halogenated hydrocarbons, NH_4NO_3, barium oxide, $Ba(NO_3)_2$, Cadmium, CS_2, chlorates, Cl_2, CrO_3, F_2, Hydroxylamine, $Pb(N_3)_2$, $MnCl_2$, HNO_3, performic acid, $KClO_3$, KNO_3, N_2O_2, Selenium, $NaClO_3$, Na_2O_2, Sulfur, Te, water, $(NH_4)_2S$, As_2O_3, CS_2, $CaCl_2$, chlorinated rubber, catalytic metals, halocarbons, o-nitroanisole, nitrobenzene, nonmetals, oxidants, paint primer base, pentacarbonoyliron, transition metal halides, seleninyl bromide, HCl, H_2SO_4, (Mg +$Ba(NO_3)_2$ +BaO_2), (ethyl acetoacetate +tribromoneopentyl alcohol.
Contact with Alkali Hydroxides(Sodium Hydroxide, Potassium Hydroxide, Calcium Hydroxide, etc) results in evolution of hydrogen.
Ammonium nitrate + zinc + water causes a violent reaction with evolution of steam and zinc oxide.
May react with water.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:

LD50: Not available.
LC50: Not available.

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:
Skin: May cause skin irritation. Dermal exposure to zinc may produce leg pains, fatigue, anorexia and weight loss.
Eyes: May cause eye irritation.
Ingestion: May be harmul if swallowed. May cause digestive tract irritation with tightness in throat, nausea, vomiting, diarrhea, loss of appetite, malaise, abdominal pain. fever, and chills. May affect behavior/central nervous system and autonomic nervous system with ataxia, lethargy, staggering gait, mild derrangement in cerebellar function, lightheadness, dizzness, irritability, muscular stiffness, and pain. May also affect blood.
Inhalation: Inhalation of zinc dust or fumes may cause respiratory tract and mucous membrane irritation with cough and chest pain. It can also cause "metal fume fever", a flu-like condition characterized appearance of chills, headached fever, maliase, fatigue, sweating, extreme thirst, aches in the legs and chest, and difficulty in breathing. A sweet taste may also be be present in metal fume fever, as well as a dry throat, aches, nausea, and vomiting, and pale grey cyanosis.
The toxicological properties of this substance have not been fully investisgated.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: Not available.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:

New York release reporting list: Zinc Metal
Rhode Island RTK hazardous substances: Zinc Metal
Pennsylvania RTK: Zinc Metal
Florida: Zinc Metal
Michigan critical material: Zinc Metal
Massachusetts RTK: Zinc Metal
New Jersey: Zinc Metal
California Director's List of Hazardous Substances: Zinc Metal
TSCA 8(b) inventory: Zinc Metal
TSCA 12(b) one time export: Zinc Metal
SARA 313 toxic chemical notification and release reporting: Zinc Metal
CERCLA: Hazardous substances.: Zinc Metal: 1000 lbs. (453.6 kg)

Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not Available

DSCL (EEC):
R15- Contact with water liberates
extremely flammable gases.
R17- Spontaneously flammable in air.
S7/8- Keep container tightly closed and dry.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 1

Reactivity: 1

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 0

Flammability: 1

Reactivity: 1

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Dust respirator. Be sure to use an
approved/certified respirator or
equivalent.
Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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ATSDR Department of Health and Human Services
Agency for Toxic Substances & Disease Registry

ToxFAQs™: Chemical Agent Briefing Sheets (CABS)

Lead

January 2006

PDF Version

- What is lead?
- What are the forms of lead?
- What are the common uses of lead?
- What are the routes of exposure for lead?
- Who are the populations most at risk and how are they usually exposed?
- What are the possible toxic effects of lead?
- How can I reduce the risk of exposure to lead?
- What are the safety guidelines for lead exposure?
- What are the most important or common mediating factors?
- Is there a test to see if my child or I have been exposed to lead?
- Future Research Needs
- For more information

What is lead?

Lead is a heavy, bluish-gray metal that has a low melting point. It occurs naturally in the Earth's crust, but it is not a particularly abundant element. It is rarely found naturally as a metal, but rather in its divalent (2+) oxidative state in ore deposits widely distributed throughout the world. The most important lead containing ores are galena (PbS), anglesite ($PbSO_4$), and cerussite ($PbCO_3$). Natural lead is a mixture of four stable isotopes: ^{208}Pb (51%–53%), ^{206}Pb (23.5%–27%), ^{207}Pb (20.5%–23%), and ^{204}Pb (1.35%–1.5%).

What are the forms of lead?

- Metallic lead
- Inorganic lead and lead compounds (or lead salts)
- Organic lead (containing carbon)

What are the common uses of lead?

The largest use for lead is in storage batteries in cars and other vehicles. Lead may be used as a pure metal, alloyed with other metals, or as chemical compounds.

Lead used by industry comes from mined ores ("primary") or from recycled scrap metal or batteries ("secondary"). However, most lead today is obtained from recovery of recycled scrap, mostly lead-acid batteries.

Human activities, such as lead mining and smelting operations and manufacturing and use of lead products (*e.g.*, leaded gasoline, lead-based paint), have resulted in the contamination of many industrial and residential areas with lead.

Form	Uses
Metallic lead	Certain uses of lead, such as leaded gasoline, lead-based paints for domestic use, lead-based solder in food cans and water pipes, lead sinkers, and ammunition, have been reduced or banned to minimize lead's harmful effects on people and animals.
Lead and lead compounds (or lead salts), such as • **lead acetate** • **lead chloride** • **lead nitrate** • **lead oxide** • **lead phosphate** • **lead acetate**	• **Cosmetics and hair dye** - Some hair dyes and some non-Western cosmetics, such as kohl and surma, contain lead. • **Fishing equipment** - Most fishing weights and sinkers are made from lead. • **Folk remedies** - Many non-Western folk remedies used to treat diarrhea or other ailments may contain substantial amounts of lead. Examples of these include alarcon, ghasard, alkohl, greta, azarcon,

• **lead sulfate** • **lead sulfide**	liga, bali goli, pay-loo-ah, coral, and rueda. • **Glazing** - Applied to some ceramicware can contain lead. • **Lead based paint** - Although the sale of residential lead-based paint was banned in the United States in 1978, it remains a major source of lead exposure for young children residing in older houses. • **Lead batteries** - Production of lead-acid batteries is the major use of lead. • **Lead-based solder** - Has been banned for use in water distribution systems, but many buildings and homes contain lead pipes or lead-based solder. Lead-based solder also is used for electrical circuitry applications. • **Lead-shot** and **ammunition** - It is the second highest production use of lead. • Other uses of lead include the production of lead alloys, soldering materials, shielding for x-ray machines, and manufacturing of corrosion- and acid-resistant materials used in the building industry.
Organic • **tetraethyl lead** • **tetramethyl lead**	The use of lead in gasoline was phased out in the 1980s, and has been banned since January 1, 1996. The use of lead in gasoline has contributed to its dispersion throughout the environment. During the combustion of gasoline containing these alkyllead compounds, significant amounts of inorganic lead can be released to the surrounding areas. **Current Uses** • Gasoline for off-road vehicles, farm equipment, and airplanes **Past Uses** • Gasoline additives (to increase octane rating)

What are the routes of exposure for lead?

People are most likely to be exposed to lead by consuming contaminated food and drinking water. Exposure can also occur by inadvertently ingesting contaminated soil, dust, or lead-based paint.

Form	Routes of Exposure
Metallic lead	• Ingestion is the primary source of exposure to the general population.
Lead and lead compounds (or lead salts), such as • **lead acetate** • **lead chloride** • **lead nitrate** • **lead oxide** • **lead phosphate** • **lead subacetate** • **lead sulfate** • **lead sulfide**	• Lead paint is a major source of environmental exposure for children who ingest flaking paint, paint chips, and weathered powdered paint (mostly from deteriorated housing units in urban areas). Lead paint can also contribute to soil/dust lead which can be inadvertently ingested via hand-to-mouth activity of young children. • Lead can leach into drinking water from lead-based solder used in water pipes. • Lead can leach into foods or liquids stored in ceramic containers made with lead glazing. • Engaging in hobbies such as casting ammunition, making fishing weights, and stained glass can result in exposure to lead. • Exposure by inhalation can result during activities such as soldering with lead solder or sanding or sandblasting lead-based paint.
Organic • **tetraethyl lead** • **tetramethyl lead**	• Inhalation • Dermal studies in animals have shown that organic lead is well absorbed through the skin

Who are the populations most at risk and how are they usually exposed?

People living near hazardous waste sites, lead smelters or refineries, battery recycling or crushi ng centers, or other industrial lead sources may be exposed to lead and chemicals that contain lead. Workers in occupations that have sources of lead exposure (*e.g.*, plumbers, miners, mechanics, and lead smelter or refinery workers).

Certain hobbies, folk remedies, home activities, and car repairs (*e.g.*, radiator repair) can contribute to lead exposure. Smoking cigarettes or breathing second-hand smoke increases exposure because tobacco smoke contains small amounts of lead.

Pregnant women, the developing fetuses, and young children are particularly vulnerable to the effe cts of lead. Young children are more likely to play in dirt and to place their hands and other objects in their

mouths, thereby increasing the opportunity for exposure via ingestion of lead-contaminated soil an d dust.

What are the possible toxic effects of lead?

The most sensitive targets for lead toxicity are the developing nervous system, the hematological and cardiovascular systems, and the kidney. However, because of lead's many modes of action in biologi cal systems, lead could potentially affect any system or organs in the body. The effects are the same whether it is breathed or swallowed.

Blood Lead Concentrations Corresponding to Adverse Health Effects

Life Stage	Effect	Blood lead (µg/dL)
Children	Depressed ALAD* activity	<5
	Neurodevelopmental effects	<10
	Sexual maturation	<10
	Depressed vitamin D	>15
	Elevated EP**	>15
	Depressed NCV***	>30
	Depressed hemoglobin	>40
	Colic	>60
Adults	Depressed GFR****	<10
	Elevated blood pressure	<10
	Elevated EP (females)	>20
	Enzymuria/proteinuria	>30
	Peripheral neuropathy	>40
	Neurobehavioral effects	>40
	Altered thyroid hormone	>40
	Reduced fertility	>40
	Depressed hemoglobin	>50
Elderly adults	Depressed ALAD*	<5
	Neurobehavioral effects	>4

*aminolevulinic acid dehydratase (ALAD)

**erythrocyte porphyrin (EP)

***nerve conduction velocity (NCV)

****glomerular filtration rate (GFR)

Source: ATSDR Toxicological Profile for Lead (Draft for Public Comment), 2005.

How can I reduce the risk of exposure to lead?

- Do not allow children to chew or mouth surfaces that may have been painted with lead-based paint (homes built before 1978).
- If you have a water lead problem, the U.S. Environmental Protection Agency (EPA) recommends that you flush your cold water pipes if they have not been used in over 6 hours by running water until it is cold (5 seconds to 2 minutes) before drinking or cooking with it.
- Avoid some types of paints and pigments that contain lead and are used as make-up or hair coloring; keep these kinds of products away from children.
- Hire a professional contractor, who is required to follow certain health safety requirements for remediation or renovation involving lead-based paint, (www.epa.gov/lead/pubs/leadinfo.htm#remodeling).
- Wash children's hands and faces often to remove lead dusts and soil, and regularly clean the house of dust and tracked in soil.

What are the safety guidelines for lead exposure?

Air

- National Institute for Occupational Safety and Health (NIOSH)

  Recommended exposure limit (REL) time-weighted average (TWA) - 0.05 mg/m^3
  Immediately dangerous to life or health (IDLH) - 100 mg/m^3

- Occupational Safety and Health Administration (OSHA)

  Air - workplace 50 $\mu g/m^3$
  Action level - 40 µg/100 g of whole blood

- The American Conference of Governmental Industrial Hygienists (ACGIH)

Threshold limit values (TLV)/(TWA) - 0.05 mg/m^3
TLV/TWA guideline for lead arsenate - 150 µg/m^3
TLV/TWA guideline for other forms of lead - 50 µg lead/m^3

- U.S. Environmental Protection Agency (EPA)

  National Primary and Secondary Ambient Air Quality Standards - 1.5 µg/m^3

- World Health Organization (WHO)

  Air quality guidelines -- 0.5 µg/m^3

Water

- EPA

  Maximum contaminant level (MCL) - action level 0.015 mg/L
  Action level for public supplies - 15 µg/L

- WHO

  Drinking Water Quality Guidelines - 0.01 mg/L

Blood

- Centers for Disease Control and Prevention (CDC)

  Level of concern for children - 10 µg/dL

- OSHA

  Cause for written notification and medical exam - 40 µg/dL
  Cause for medical removal from exposure - 50 µg/dL

- ACGIH

  Advisory; biological exposure index - 30 µg/dL

Food

- Food and Drug Administration (FDA)

  Bottled drinking water - 0.005 mg/L

Other

- ACGIH

  Biological exposure indices (lead in blood) - 30 µg/100 mL

- Consumer Product Safety Commission

  Paint - 600 ppm

- FDA

  Ceramicware (µg/mL leaching solution) - 0.5-3.0 µg/mL

µg/m^3: micrograms per cubic meter
µg/dL: micrograms per deciliter
µg/L: micrograms per liter
g: gram
mg/L: milligrams per liter
mL: milliliter
ppm: parts per million

What are the most important or common mediating factors?

Factors that determine the severity of the health effects from lead exposure include

- Dose
- Age of the person exposed
  - the developing nervous system is the most sensitive system to the effects of lead
  - the efficiency of lead absorption from the gastrointestinal tract is greater in children than in adults
- Life stages of women (childbirth, lactating, menopause)
- Occupational exposures
- Duration of exposure
- Health and lifestyle of the person exposed
- Nutritional status of the person exposed
  - a diet adequate in calcium and iron may decrease lead absorption

The toxic effects of lead exposure may be worse in individuals with inherited genetic diseases or gene polymorphisms such as thalassemia, individuals with glucose-6-phosphate dehydrogenase (G6PD) deficiency, and carriers of certain gene polymorphic forms (*e.g.*, ALAD and vitamin D receptor). Research continues about this topic.

Is there a test to see if my child or I have been exposed to lead?

Blood	• The screening test of choice is blood lead levels. • Blood tests are commonly used to screen children for lead poisoning. • Analysis of lead in whole blood is the most common and accurate method of assessing lead exposure. • Exposure to lead also can be evaluated by measuring erythrocyte protoporphyrin (EP) in blood samples. EP is a part of red blood cells known to increase when the amount of lead in the blood is high. However, the EP level is not sensitive enough to identify children with elevated blood lead levels below about 25 micrograms per deciliter (µg/dL).
Bone and Teeth	• X-ray fluorescence techniques have been used to determine lead concentration in bones and teeth. It is not widely available and is used mostly in research. • Lead partitions to bone over a lifetime of exposure; therefore, bone lead measurements may be a better indicator of cumulative exposure than blood lead.
Urine	• Measurements of urinary lead levels have been used to assess lead exposure. • The measurement of lead excreted in urine following chelation with calcium disodium EDTA (EDTA provocation) has been used to detect elevated body burden of lead in adults and children.
Hair and Nails	• These are not reliable for testing due to errors external contamination. They are relatively poor predictors of blood lead, particularly at low concentrations.

Future Research Needs

To close current gaps in the scientific database on the health effects of lead, a long–term resear ch program is needed that might include the following:

- Further short-term studies or studies in vitro designed to clarify mechanisms of action for the various toxicities might be useful.
- Studies identifying exposures during different developmental periods can help identify critical periods of vulnerability for immunocompetence, development of sex organs, or neurobehavioral parameters.
- Chronic-duration exposure studies in animals would expand information on the toxicity of lead. Special studies that examine biochemical and morphological effects of lead may provide new information on mechanisms of action of lead, particularly for the effects of greatest concern such as neurobehavioral changes in children.
- Development of new and more sensitive tests of specific neuropsychological functions.
- Further investigation of links between lead and amyotrophic lateral sclerosis, essential tremor, schizophrenia, and Parkinson's disease.
- Epidemiological studies designed in a manner that permits more rigorous assessments of effect modification.
- Studies about the long-term consequences of lead-related neurobehavioral deficits detected in infants and children and the manifestation of chronic neurobehavioral problems in adolescence and adulthood.
- Further characterization of bone lead concentration as a biomarker of exposure for various effect end points (*e.g.*, blood pressure and renal effects).
- Studies of the potential prevalence of elevated bone lead stores in women of reproductive age and the associated risk that this poses to fetal development by mobilization of maternal bone stores during pregnancy.
- Further clarification of the role of some genetic polymorphisms.
- Evaluation of cohorts from prospective studies into adulthood for potential late-appearing effects including cancer.

For more information

- Agency for Toxic Substances and Disease Registry (ATSDR) Toxicological Profile for Lead

  http://www.atsdr.cdc.gov/toxprofiles/tp13.html

- ATSDR ToxFAQs™ for Lead

  http://www.atsdr.cdc.gov/tfacts13.html

- ATSDR Case Studies in Environmental Medicine Lead Toxicity

  http://www.atsdr.cdc.gov/csem/lead/

- ATSDR Interaction Profile for Chemical Mixtures for Arsenic, Cadmium, Chromium, and Lead

  http://www.atsdr.cdc.gov/interactionprofiles/ip04.html

- ATSDR Interaction Profile for Chemical Mixtures for Lead, Manganese, Zinc, and Copper

  http://www.atsdr.cdc.gov/interactionprofiles/ip06.html

- ATSDR Interaction Profile for Chemical Mixtures for Chlorpyrifos, Lead, Mercury, and Methylmercury

  http://www.atsdr.cdc.gov/interactionprofiles/ip11.html

- Centers for Disease Control and Prevention Lead Web Page

  http://www.cdc.gov/lead/

- U.S. Environmental Protection Agency Lead Web Page

  http://www.epa.gov/lead/

- U.S. Department of Labor, Occupational Safety & Health Administration

  http://www.osha.gov/SLTC/lead/

For more information, contact:

Agency for Toxic Substances and Disease Registry
Division of Toxicology and Environmental Medicine
1600 Clifton Road NE, Mailstop F-32
Atlanta, GA 30333
Phone: 1-800-CDC-INFO (800-232-4636)
TTY 888-232-6348

FAX: (770)-488-4178
Email: CDCINFO@cdc.gov

This page was updated on 01/04/2008

Mercury

Mercury is a naturally occurring metal found in air, water, and soil. It exists in several forms, including elemental (or metallic) mercury, inorganic mercury compounds, and organic mercury compounds:

- **Elemental mercury** is liquid at room temperature and is used in thermometers, fluorescent light bulbs, some electrical switches, and some industrial processes.
- **Inorganic mercury** compounds are formed when mercury combines with other elements to form salts, which are usually powders or crystals. Inorganic mercury compounds are found naturally in the environment. Some forms of inorganic mercury have been used in antiseptic creams, ointments, and preservatives.
- **Organic mercury** compounds are formed when mercury combines with carbon. Microscopic organisms can produce organic mercury compounds (methylmercury) in contaminated water and soil, which can accumulate in the food chain. Other special types of organomercurials have been used as medical preservatives and medicines.

How People Are Exposed to Mercury

- Eating fish or shellfish that is contaminated with methylmercury, which is the main source of general human exposures to mercury;
- Breathing air contaminated with elemental mercury vapors (e.g., in workplaces such as dental offices and industries that use mercury or in locations where a mercury spill or release has occurred);
- Having dental fillings that contain mercury; and
- Practicing cultural or religious rituals that use mercury.

How Mercury Affects People's Health

- Short-term exposure to extremely high levels of elemental mercury vapors can result in lung damage, nausea, diarrhea, increases in blood pressure or heart rate, skin rashes, eye irritation, and injury to the nervous system.
- Prolonged exposure to lower levels of elemental mercury can permanently damage the brain and kidneys.
- The developing brain of a fetus can be injured if the mother is exposed to methylmercury.

Levels of Mercury in U.S. Population

Scientists tested levels of mercury in the blood of 16,780 participants who took part in CDC's national study known as the National Health and Nutrition Examination Survey (NHANES). These findings are based on total blood mercury levels in the U.S. general

population for persons aged 1 year and older who participated in NHANES during 2003-2006, as well as trends in the total mercury of children aged 1–5 and females aged 16–49 during 1999–2006.

- In the total population during 2003–2006, the total blood mercury levels for non–Hispanic blacks and non–Hispanic whites were higher than those for Mexican Americans.
- Across the age groups in the total population during 2003-2006, total blood mercury levels increased with age, peaked at the fifth or sixth decade, depending on race/ethnicity, and then declined.
- In the most recent survey period of 2005–2006, the 95th percentile levels for total blood mercury in children aged 1-5 years and females aged 16-49 years were 1.43 µg/L and 4.48 µg/L, respectively. The 95th percentile means that 95 percent of the U.S. population's exposure is below this estimated level. Conversely, only 5 percent of the population will have values at this level or higher.
- Over the four survey periods from 1999-2006, blood mercury levels increased slightly for non–Hispanic white children and decreased slightly for non–Hispanic black and Mexican American children. Female children had slightly higher blood mercury levels than male children.

For More Information

- Agency for Toxic Substances and Disease Registry
  Detailed information about mercury and public health is available at http://www.atsdr.cdc.gov/alerts/970626.html and http://www.atsdr.cdc.gov/cabs/mercury/index.html
- CDC Emergency Preparedness and Response
  Case definitions of mercury, toxicology FAQs, and toxicological profile at http://emergency.cdc.gov/agent/mercury/

May 2009

The Centers for Disease Control and Prevention (CDC) protects people's health and safety by preventing and controlling diseases and injuries; enhances health decisions by providing credible information on critical health issues; and promotes healthy living through strong partnerships with local, national, and international organizations.

Department of Health and Human Services
Agency for Toxic Substances & Disease Registry

ATSDR Home › ToxFAQs™ Arsenic

ToxFAQs™

ToxFAQs™
for
Arsenic
(*Arsénico*)
August 2007

PDF Version, 92 KB

CAS#: 7440-38-2

This fact sheet answers the most frequently asked health questions (FAQs) about arsenic. For more information, call the ATSDR Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardo us substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

- Highlights
- What is arsenic?
- What happens to arsenic when it enters the environment?
- How might I be exposed to arsenic?
- How can arsenic affect my health?
- How likely is arsenic to cause cancer?
- How does arsenic affect children?
- How can families reduce their risk for exposure to arsenic?
- Is there a medical test to show whether I've been exposed to arsenic?
- Has the federal government made recommendations to protect human health?
- References
- Contact Information

Highlights

Exposure to higher than average levels of arsenic occur mostly in the workplace, near hazardous wa ste sites, or in areas with high natural levels. At high levels, inorganic arsenic can cause death. Exposure to lower levels for a long time can ca use a discoloration of the skin and the appearance of small corns or warts. Arsenic has been found in at least 1,149 of the 1,684 National Priority List sites identified by the Environmental Protection Agency (EPA).

What is arsenic?

Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environme nt, arsenic is combined with oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic in animals and plants combines with carbon and hydrogen to form organic arsenic compounds.

Inorganic arsenic compounds are mainly used to preserve wood. Copper chromated arsenate (CCA) is u sed to make "pressure-treated" lumber. CCA is no longer used in the U.S. for residential uses; it is still used in industrial application s. Organic arsenic compounds are used as pesticides, primarily on cotton fields and orchards.

What happens to arsenic when it enters the environment?

- Arsenic occurs naturally in soil and minerals and may enter the air, water, and land from wind-blo wn dust and may get into water from runoff and leaching.
- Arsenic cannot be destroyed in the environment. It can only change its form.
- Rain and snow remove arsenic dust particles from the air.
- Many common arsenic compounds can dissolve in water. Most of the arsenic in water will ultimately end up in soil or sediment.
- Fish and shellfish can accumulate arsenic; most of this arsenic is in an organic form called arsen obetaine that is much less harmful.

How might I be exposed to arsenic?

- Ingesting small amounts present in your food and water or breathing air containing arsenic.
- Breathing sawdust or burning smoke from wood treated with arsenic.
- Living in areas with unusually high natural levels of arsenic in rock.
- Working in a job that involves arsenic production or use, such as copper or lead smelting, wood tr eating, or pesticide application.

How can arsenic affect my health?

Breathing high levels of inorganic arsenic can give you a sore throat or irritated lungs.

Ingesting very high levels of arsenic can result in death. Exposure to lower levels can cause naus ea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of “pins an d needles” in hands and feet.

Ingesting or breathing low levels of inorganic arsenic for a long time can cause a darkening of th e skin and the appearance of small “corns” or “warts” on the palms, soles, and torso.

Skin contact with inorganic arsenic may cause redness and swelling.

Almost nothing is known regarding health effects of organic arsenic compounds in humans. Studies i n animals show that some simple organic arsenic compounds are less toxic than inorganic forms. Ingestion of methyl and dimethyl compounds can cause diarrhea and damage to the kidneys.

How likely is arsenic to cause cancer?

Several studies have shown that ingestion of inorganic arsenic can increase the risk of skin cance r and cancer in the liver, bladder, and lungs. Inhalation of inorganic arsenic can cause increased risk of lung cancer. The Department of Health and Human Services (DHHS) and the EPA have determined that inorganic arsenic is a known human carcinogen. The International Agency for R esearch on Cancer (IARC) has determined that inorganic arsenic is carcinogenic to humans.

How does arsenic affect children?

There is some evidence that long-term exposure to arsenic in children may result in lower IQ score s. There is also some evidence that exposure to arsenic in the womb and early childhood may increase mortality in young adults.

There is some evidence that inhaled or ingested arsenic can injure pregnant women or their unborn babies, although the studies are not definitive. Studies in animals show that large doses of arsenic that cause illness in pregnant fem ales, can also cause low birth weight, fetal malformations, and even fetal death. Arsenic can cross the placenta and has been found in fetal ti ssues. Arsenic is found at low levels in breast milk.

How can families reduce their risk for exposure to arsenic?

- If you use arsenic-treated wood in home projects, you should wear dust masks, gloves, and protecti ve clothing to decrease exposure to sawdust.
- If you live in an area with high levels of arsenic in water or soil, you should use cleaner source s of water and limit contact with soil.
- If you work in a job that may expose you to arsenic, be aware that you may carry arsenic home on y our clothing, skin, hair, or tools. Be sure to shower and change clothes before going home.

Is there a medical test to show whether I've been exposed to arsenic?

There are tests available to measure arsenic in your blood, urine, hair, and fingernails. The urin e test is the most reliable test for arsenic exposure within the last few days. Tests on hair and fingernails can measure exposure to high levels of ars enic over the past 6-12 months. These tests can determine if you have been exposed to above-average levels of arsenic. They cannot predict whether the arsenic levels in your body will affect your health.

Has the federal government made recommendations to protect human health?

The EPA has set limits on the amount of arsenic that industrial sources can release to the environ ment and has restricted or cancelled many of the uses of arsenic in pesticides. EPA has set a limit of 0.01 parts per million (ppm) for arsenic in drinking water.

The Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit (PEL) of 10 micrograms of arsenic per cubic meter of workplace air (10 $\mu g/m^3$) for 8 hour shifts and 40 hour work weeks.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for Arsenic *(Update)*. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information?

For more information, contact:

Agency for Toxic Substances and Disease Registry
Division of Toxicology and Environmental Medicine
1600 Clifton Road NE, Mailstop F-62
Atlanta, GA 30333
Phone: 1-800-CDC-INFO • 888-232-6348 (TTY)
FAX: 770-488-4178
Email: cdcinfo@cdc.gov

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state heal th or environmental quality department if you have any more questions or concerns.

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U.S. Environmental Protection Agency

Pesticides: Topical & Chemical Fact Sheets

Assessing Health Risks from Pesticides

January 1999
735-F-99-002

The Federal Government, in cooperation with the States, carefully regulates pesticides to ensure that they do not pose unreasonable risks to human health or the environment. As part of that effort, the Environmental Protection Agency (EPA) requires extensive test data from pesticide producers that demonstrate pesticide products can be used without posing harm to human health and the environment. EPA scientists and analysts carefully review these data to determine whether to register (license) a pesticide product or a use and whether specific restrictions are necessary. This fact sheet is a brief overview of EPA's process for assessing potential risks to human health when evaluating pesticide products.

Background

There are more than 865 active ingredients registered as pesticides, which are formulated into thousands of pesticide products that are available in the marketplace. About 350 pesticides are used on the foods we eat, and to protect our homes and pets.

EPA plays a critical role in evaluating these chemicals prior to registration, and in reevaluating older pesticides already on the market, to ensure that they can be used with a reasonable certainty of no harm. The process EPA uses for evaluating the health impacts of a pesticide is called risk assessment.

EPA uses the National Research Council's four-step process for human health risk assessment:

Step One: Hazard Identification
Step Two: Dose-Response Assessment
Step Three: Exposure Assessment
Step Four: Risk Characterization

Step One: Hazard Identification (Toxicology)

The first step in the risk assessment process is to identify potential health effects that may occur from different types of pesticide exposure. EPA considers the full spectrum of a pesticide's potential health effects.

Generally, for human health risk assessments, many toxicity studies are conducted on animals by pesticide companies in independent laboratories and evaluated for acceptability by EPA scientists. EPA evaluates pesticides for a wide range of adverse effects, from eye and skin irritation to cancer and birth defects in laboratory animals. EPA may also consult the public literature or other sources of supporting information on any aspect of the chemical.

Step Two: Dose-Response Assessment

Paracelsus, the Swiss physician and alchemist, the "father" of modern toxicology (1493-1541) said,

> "The dose makes the poison."

In other words, **the amount of a substance a person is exposed to** is as important as **how toxic the chemical might be**. For example, small doses of aspirin can be beneficial to people, but at very high doses, this common medicine can be deadly. In some individuals, even at very low doses, aspirin may be deadly.

Dose-response assessment involves considering the dose levels at which adverse effects were observed in test animals, and using these dose levels to calculate an equal dose in humans.

Step Three: Exposure Assessment

People can be exposed to pesticides in three ways:

1. Inhaling pesticides (inhalation exposure),
2. Absorbing pesticides through the skin (dermal exposure), and
3. Getting pesticides in their mouth or digestive tract (oral exposure).

Depending on the situation, pesticides could enter the body by any one or all of these routes. Typical sources of pesticide exposure include:

- **Food**
  Most of the foods we eat have been grown with the use of pesticides. Therefore, pesticide residues may be present inside or on the surfaces of these foods.

- **Home and Personal Use Pesticides**
  You might use pesticides in and around your home to control insects, weeds, mold, mildew, bacteria, lawn and garden pests and to protect your pets from pests such as fleas. Pesticides may also be used as insect repellants which are directly applied to the skin or clothing.

- **Pesticides in Drinking Water**
  Some pesticides that are applied to farmland or other land structures can make their way in small amounts to the ground water or surface water systems that feed drinking water supplies.

- **Worker Exposure to Pesticides**
  Pesticide applicators, vegetable and fruit pickers and others who work around pesticides can be exposed due to the nature of their jobs. To address the unique risks workers face from occupational exposure, EPA evaluates occupational exposure through a separate program. All pesticides registered by EPA have been shown to be safe when used properly.

Step Four: Risk Characterization

Risk characterization is the final step in assessing human health risks from pesticides. It is the process of combining the hazard, dose-response and exposure assessments to describe the overall risk from a pesticide. It explains the assumptions used in assessing exposure as well as the uncertainties that are built into the dose-response assessment. The strength of the overall database is considered, and broad

conclusions are made. EPA's role is to evaluate both toxicity and exposure and to determine the risk associated with use of the pesticide.

Simply put,

RISK = TOXICITY x EXPOSURE.

This means that the risk to human health from pesticide exposure depends on both the toxicity of the pesticide and the likelihood of people coming into contact with it. At least *some* exposure and *some* toxicity are required to result in a risk. For example, if the pesticide is very poisonous, but no people are exposed, there is no risk. Likewise, if there is ample exposure but the chemical is non-toxic, there is no risk. However, usually when pesticides are used, there is some toxicity and exposure, which results in a potential risk.

EPA recognizes that effects vary between animals of different species and from person to person. To account for this variability, *uncertainty factors* are built into the risk assessment. These uncertainty factors create an additional margin of safety for protecting people who may be exposed to the pesticides. FQPA requires EPA to use an extra 10-fold safety factor, if necessary, to protect infants and children from effects of the pesticide.

Types of Toxicity Tests EPA Requires for Human Health Risk Assessments

EPA evaluates studies conducted over different periods of time and that measure specific types of effects. These tests are evaluated to screen for potential health effects in infants, children and adults.

Acute Testing: Short-term exposure; a single exposure (dose).

- Oral, dermal (skin), and inhalation exposure
- Eye irritation
- Skin irritation
- Skin sensitization
- Neurotoxicity

Sub-chronic Testing: Intermediate exposure; repeated exposure over a longer period of time (i.e., 30-90 days).

- Oral, dermal (skin), and inhalation
- Neurotoxicity (nerve system damage)

Chronic Toxicity Testing: Long-term exposure; repeated exposure lasting for most of the test animal's life span. Intended to determine the effects of a pesticide after prolonged and repeated exposures.

- Chronic effects (non-cancer)
- Carcinogenicity (cancer)

Developmental and Reproductive Testing: Identify effects in the fetus of an exposed pregnant female (birth defects) and how pesticide exposure affects the ability of a test animal to successfully reproduce.

Mutagenicity Testing: Assess a pesticide's potential to affect the cell's genetic components.

Hormone Disruption: Measure effects for their potential to disrupt the endocrine system. The endocrine system consists of a set of glands and the hormones they produce that help guide the development, growth, reproduction, and behavior of animals including humans.

Risk Management

Once EPA completes the risk assessment process for a pesticide, we use this information to determine if (when used according to label directions), there is a reasonable certainty that the pesticide will not harm a person's health.

Using the conclusions of a risk assessment, EPA can then make a more informed decision regarding whether to approve a pesticide chemical or use, as proposed, or whether additional protective measures are necessary to limit occupational or non-occupational exposure to a pesticide. For example, EPA may prohibit a pesticide from being used on certain crops because consuming too much food treated with the pesticide may result in an unacceptable risk to consumers. Another example of protective measures is requiring workers to wear personal protective equipment (PPE) such as a respirator or chemical resistant gloves, or not allowing workers to enter treated crop fields until a specific period of time has passed.

If, after considering all appropriate risk reduction measures, the pesticide still does not meet EPA's safety standard, the Agency will not allow the proposed chemical or use. Regardless of the specific measures enforced, EPA's primary goal is to ensure that legal uses of the pesticide are protective of human health, especially the health of children, and the environment.

Human Health Risk Assessment and the Law

Federal law requires detailed evaluation of pesticides to protect human health and the environment. In 1996, Congress made significant changes to strengthen pesticide laws through the Food Quality Protection Act (FQPA). Many of these changes are key elements of the current risk assessment process. FQPA required that EPA consider:

- **A New Safety Standard**: FQPA strengthened the safety standard that pesticides must meet before being approved for use. EPA must ensure with a reasonable certainty that no harm will result from the legal uses of the pesticide.
- **Exposure from All Sources**: In evaluating a pesticide, EPA must estimate the combined risk from that pesticide from all non-occupational sources, such as:
  - Food Sources
  - Drinking Water Sources
  - Residential Sources
- **Cumulative Risk**: EPA is required to evaluate pesticides in light of similar toxic effects that different pesticides may share, or "a common mechanism of toxicity." At this time, EPA is developing a methodology for this type of assessment.
- **Special Sensitivity of Children to Pesticides**: EPA must ascertain whether there is an increased susceptibility from exposure to the pesticide to infants and children. EPA must build an additional 10-fold safety factor into risk assessments to ensure the protection of infants and children, unless it is determined that a lesser margin of safety will be safe for infants and children.

For More Information

If you would like more information about EPA's pesticide programs, contact the Communication Service Branch at (703) 305-5017 or visit the Pesticides Web site.

For more information on specific pesticides, or to inquire about the symptoms of pesticide poisoning, call the National Pesticide Information Center (NPIC), a toll-free hotline information at: 1-800-858-7378, or visit their Web site EXIT disclaimer .

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

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How can families reduce the risk of exposure to polychlorinated biphenyls (PCBs)??
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References

February 2001

ToxFAQs™ for Polychlorinated Biphenyls (PCBs)

(Bifenilos Policlorados (BPCs))

This fact sheet answers the most frequently asked health questions about polychlorinated biphenyls (PCBs). For more information, you may call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Polychlorinated biphenyls (PCBs) are a mixture of individual chemicals which are no longer produced in the United States, but are still found in the environment. Health effects that have been associated with exposure to PCBs include acne-like skin conditions in adults and neurobehavioral and immunological changes in children. PCBs are known to cause cancer in animals. PCBs have been found in at least 500 of the 1,598 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What are polychlorinated biphenyls (PCBs)?

Polychlorinated biphenyls are mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. PCBs are either oily liquids or solids that are colorless to light yellow. Some PCBs can exist as a vapor in air. PCBs have no known smell or taste. Many commercial PCB mixtures are known in the U.S. by the trade name Aroclor.

PCBs have been used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they don't burn easily and are good insulators. The manufacture of PCBs was stopped in the U.S. in 1977 because of evidence they build up in the environment and can cause harmful health effects. Products made before 1977 that may contain PCBs include old fluorescent lighting fixtures and electrical devices containing PCB capacitors,

Contact Information

RELATED RESOURCES

ToxFAQ™ 35k

ToxFAQ™ en Español 32k

Public Health Statement 125k

Public Health Statement en Español 321k

Toxicological Profile 13.6MB

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ATSDR RESOURCES

ToxFAQs™

ToxFAQs™ en Español

Public Health Statements

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Minimum Risk Levels

MMGs

MHMIs

Interaction Profiles

Priority List of Hazardous Substances

Division of Toxicology

and old microscope and hydraulic oils.

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What happens to polychlorinated biphenyls (PCBs) when they enter the environment?

- PCBs entered the air, water, and soil during their manufacture, use, and disposal; from accidental spills and leaks during their transport; and from leaks or fires in products containing PCBs.
- PCBs can still be released to the environment from hazardous waste sites; illegal or improper disposal of industrial wastes and consumer products; leaks from old electrical transformers containing PCBs; and burning of some wastes in incinerators.
- PCBs do not readily break down in the environment and thus may remain there for very long periods of time. PCBs can travel long distances in the air and be deposited in areas far away from where they were released. In water, a small amount of PCBs may remain dissolved, but most stick to organic particles and bottom sediments. PCBs also bind strongly to soil.
- PCBs are taken up by small organisms and fish in water. They are also taken up by other animals that eat these aquatic animals as food. PCBs accumulate in fish and marine mammals, reaching levels that may be many thousands of times higher than in water.

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How might I be exposed to polychlorinated biphenyls (PCBs)?

- Using old fluorescent lighting fixtures and electrical devices and appliances, such as television sets and refrigerators, that were made 30 or more years ago. These items may leak small amounts of PCBs into the air when they get hot during operation, and could be a source of skin exposure.
- Eating contaminated food. The main dietary sources of PCBs are fish (especially sportfish caught in contaminated lakes or rivers), meat, and dairy products.
- Breathing air near hazardous waste sites and drinking contaminated well water.
- In the workplace during repair and maintenance of PCB transformers; accidents, fires or spills involving transformers, fluorescent lights, and other old electrical devices; and disposal of PCB materials.

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How can polychlorinated biphenyls (PCBs) affect my health?

The most commonly observed health effects in people exposed to large amounts of PCBs are skin conditions such as acne and rashes. Studies in exposed workers have shown changes in blood and urine that may indicate liver damage. PCB exposures in the general population are not likely to result in skin and liver effects. Most of the studies of health effects of PCBs in the general population examined children of mothers who were exposed to PCBs.

Animals that ate food containing large amounts of PCBs for short periods of time had mild liver damage and some died. Animals that ate smaller amounts of PCBs in food over several weeks or months developed various kinds of health effects, including anemia; acne-like skin conditions; and liver, stomach, and thyroid gland injuries. Other effects of PCBs in animals include changes in the immune system, behavioral alterations, and impaired reproduction. PCBs are not known to cause birth defects.

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How likely are polychlorinated biphenyls (PCBs) to cause cancer?

Few studies of workers indicate that PCBs were associated with certain kinds of cancer in humans, such as cancer of the liver and biliary tract. Rats that ate food containing high levels of PCBs for two years developed liver cancer. The Department of Health and Human Services (DHHS) has concluded that PCBs may reasonably be anticipated to be carcinogens. The EPA and the International Agency for Research on Cancer (IARC) have determined that PCBs are probably carcinogenic to humans.

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How do polychlorinated biphenyls (PCBs) affect children?

Women who were exposed to relatively high levels of PCBs in the workplace or ate large amounts of fish contaminated with PCBs had babies that weighed slightly less than babies from women who did not have these exposures. Babies born to women who ate PCB-contaminated fish also showed abnormal responses in tests of infant behavior. Some of these behaviors, such as problems with motor skills and a decrease in short-term memory, lasted for several years. Other studies suggest that the immune system was affected in children born to and nursed by mothers exposed to increased levels of PCBs. There are no reports of structural birth defects caused by exposure to PCBs or of health effects of PCBs in older children. The most likely way infants will be exposed to PCBs is from breast milk. Transplacental transfers of PCBs were also reported In most cases, the benefits of breast-feeding outweigh any risks from exposure to PCBs in mother's milk.

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How can families reduce the risk of exposure to polychlorinated biphenyls (PCBs)?

- You and your children may be exposed to PCBs by eating fish or wildlife caught from contaminated locations. Certain states, Native American tribes, and U.S. territories have issued advisories to warn people about PCB-contaminated fish and fish-eating wildlife. You can reduce your family's exposure to PCBs by obeying these advisories.
- Children should be told not play with old appliances, electrical equipment, or transformers, since they may contain PCBs.
- Children should be discouraged from playing in the dirt near hazardous waste sites and in areas where there was a transformer fire. Children should also be discouraged from eating dirt and putting dirty hands, toys or other objects in their mouths, and should wash hands frequently.
- If you are exposed to PCBs in the workplace it is possible to carry them home on your clothes, body, or tools. If this is the case, you should shower and change clothing before leaving work, and your work clothes should be kept separate from other clothes and laundered separately.

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Is there a medical test to show whether I've been exposed to polychlorinated biphenyls (PCBs)?

Tests exist to measure levels of PCBs in your blood, body fat, and breast milk, but these are not routinely conducted. Most people normally have low levels of PCBs in their body because nearly everyone has been environmentally exposed to PCBs. The tests can show if your PCB levels are elevated, which would indicate past exposure to above-normal levels of PCBs, but cannot determine when or how long you were exposed or whether you will develop health effects.

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Has the federal government made recommendations to protect human health?

The EPA has set a limit of 0.0005 milligrams of PCBs per liter of drinking water (0.0005 mg/L). Discharges, spills or accidental releases of 1 pound or more of PCBs into the environment must be reported to the EPA. The Food and Drug Administration (FDA) requires that infant foods, eggs, milk and other dairy products, fish and shellfish, poultry and red meat contain no more than 0.2-3 parts of PCBs per million parts (0.2-3 ppm) of food. Many states have established fish and wildlife consumption advisories for PCBs.

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References

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological Profile for polychlorinated biphenyls (PCBs). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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Where can I get more information?

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

For more information, contact:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, Mailstop F-32
Atlanta, GA 30333
Phone: 1-888-42-ATSDR (1-888-422-8737)
FAX: (770)-488-4178
Email: ATSDRIC@cdc.gov

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ATSDR Department of Health and Human Services
Agency for Toxic Substances & Disease Registry

2007 CERCLA Priority List of Hazardous Substances

2007 RANK	SUBSTANCE NAME	TOTAL POINTS	2005 RANK	CAS #
1	ARSENIC	1672.58	1	007440-38-2
2	LEAD	1534.07	2	007439-92-1
3	MERCURY	1504.69	3	007439-97-6
4	VINYL CHLORIDE	1387.75	4	000075-01-4
5	POLYCHLORINATED BIPHENYLS	1365.78	5	001336-36-3
6	BENZENE	1355.96	6	000071-43-2
7	CADMIUM	1324.22	8	007440-43-9
8	POLYCYCLIC AROMATIC HYDROCARBONS	1316.98	7	130498-29-2
9	BENZO(A)PYRENE	1312.45	9	000050-32-8
10	BENZO(B)FLUORANTHENE	1266.55	10	000205-99-2
11	CHLOROFORM	1223.03	11	000067-66-3
12	DDT, P,P'-	1193.36	12	000050-29-3
13	AROCLOR 1254	1182.63	13	011097-69-1
14	AROCLOR 1260	1177.77	14	011096-82-5
15	DIBENZO(A,H)ANTHRACENE	1165.88	15	000053-70-3
16	TRICHLOROETHYLENE	1154.73	16	000079-01-6
17	DIELDRIN	1150.91	17	000060-57-1
18	CHROMIUM, HEXAVALENT	1149.98	18	018540-29-9
19	PHOSPHORUS, WHITE	1144.77	19	007723-14-0
20	CHLORDANE	1133.21	21	000057-74-9
21	DDE, P,P'-	1132.49	20	000072-55-9
22	HEXACHLOROBUTADIENE	1129.63	22	000087-68-3
23	COAL TAR CREOSOTE	1124.32	23	008001-58-9
24	ALDRIN	1117.22	25	000309-00-2
25	DDD, P,P'-	1114.83	24	000072-54-8
26	BENZIDINE	1114.24	26	000092-87-5
27	AROCLOR 1248	1112.20	27	012672-29-6
28	CYANIDE	1099.48	28	000057-12-5
29	AROCLOR 1242	1093.14	29	053469-21-9
30	AROCLOR	1091.52	62	012767-79-2
31	TOXAPHENE	1086.65	30	008001-35-2
32	HEXACHLOROCYCLOHEXANE, GAMMA-	1081.63	32	000058-89-9
33	TETRACHLOROETHYLENE	1080.43	31	000127-18-4
34	HEPTACHLOR	1072.67	33	000076-44-8
35	1,2-DIBROMOETHANE	1064.06	34	000106-93-4
36	HEXACHLOROCYCLOHEXANE, BETA-	1060.22	37	000319-85-7
37	ACROLEIN	1059.07	36	000107-02-8
38	DISULFOTON	1058.85	35	000298-04-4
39	BENZO(A)ANTHRACENE	1057.96	38	000056-55-3
40	3,3'-DICHLOROBENZIDINE	1051.61	39	000091-94-1

41	ENDRIN	1048.57	41	000072-20-8
42	BERYLLIUM	1046.12	40	007440-41-7
43	HEXACHLOROCYCLOHEXANE, DELTA-	1038.27	42	000319-86-8
44	1,2-DIBROMO-3-CHLOROPROPANE	1035.55	43	000096-12-8
45	PENTACHLOROPHENOL	1028.01	45	000087-86-5
46	HEPTACHLOR EPOXIDE	1027.12	44	001024-57-3
47	CARBON TETRACHLORIDE	1023.32	46	000056-23-5
48	AROCLOR 1221	1018.41	47	011104-28-2
49	COBALT	1015.57	50	007440-48-4
50	DDT, O,P'-	1014.71	49	000789-02-6
51	AROCLOR 1016	1014.33	48	012674-11-2
52	DI-N-BUTYL PHTHALATE	1007.49	52	000084-74-2
53	NICKEL	1005.40	55	007440-02-0
54	ENDOSULFAN	1004.65	54	000115-29-7
55	ENDOSULFAN SULFATE	1003.56	53	001031-07-8
56	DIAZINON	1002.08	57	000333-41-5
57	ENDOSULFAN, ALPHA	1001.30	58	000959-98-8
58	XYLENES, TOTAL	996.07	59	001330-20-7
59	CIS-CHLORDANE	995.08	51	005103-71-9
60	DIBROMOCHLOROPROPANE	994.87	60	067708-83-2
61	METHOXYCHLOR	994.47	61	000072-43-5
62	BENZO(K)FLUORANTHENE	981.26	63	000207-08-9
63	ENDRIN KETONE	978.99	64	053494-70-5
64	TRANS-CHLORDANE	973.99	56	005103-74-2
65	CHROMIUM(VI) OXIDE	969.58	66	001333-82-0
66	METHANE	959.78	67	000074-82-8
67	ENDOSULFAN, BETA	959.19	65	033213-65-9
68	AROCLOR 1232	955.64	68	011141-16-5
69	ENDRIN ALDEHYDE	954.86	69	007421-93-4
70	BENZOFLUORANTHENE	951.48	70	056832-73-6
71	TOLUENE	947.50	71	000108-88-3
72	2-HEXANONE	942.02	72	000591-78-6
73	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	938.11	73	001746-01-6
74	ZINC	932.89	74	007440-66-6
75	DIMETHYLARSINIC ACID	922.06	75	000075-60-5
76	DI(2-ETHYLHEXYL)PHTHALATE	919.02	76	000117-81-7
77	CHROMIUM	908.52	77	007440-47-3
78	NAPHTHALENE	896.67	78	000091-20-3
79	1,1-DICHLOROETHENE	891.19	79	000075-35-4
80	METHYLENE CHLORIDE	888.96	81	000075-09-2
81	AROCLOR 1240	888.11	80	071328-89-7
82	2,4,6-TRINITROTOLUENE	883.59	82	000118-96-7
83	BROMODICHLOROETHANE	870.00	83	000683-53-4
84	HYDRAZINE	864.41	85	000302-01-2
85	1,2-DICHLOROETHANE	863.99	84	000107-06-2
86	2,4,6-TRICHLOROPHENOL	863.71	86	000088-06-2
87	2,4-DINITROPHENOL	860.45	87	000051-28-5
88	BIS(2-CHLOROETHYL) ETHER	859.88	88	000111-44-4
89	THIOCYANATE	849.21	89	000302-04-5
90	ASBESTOS	841.54	90	001332-21-4
91	CHLORINE	840.37	92	007782-50-5
92	CYCLOTRIMETHYLENETRINITRAMINE (RDX)	840.28	91	000121-82-4
93	HEXACHLOROBENZENE	838.34	93	000118-74-1

94	2,4-DINITROTOLUENE	837.88	96	000121-14-2
95	RADIUM-226	835.93	94	013982-63-3
96	ETHION	834.03	97	000563-12-2
97	1,1,1-TRICHLOROETHANE	833.81	95	000071-55-6
98	URANIUM	833.41	98	007440-61-1
99	ETHYLBENZENE	832.13	99	000100-41-4
100	RADIUM	828.07	100	007440-14-4
101	THORIUM	825.17	101	007440-29-1
102	4,6-DINITRO-O-CRESOL	822.78	102	000534-52-1
103	1,3,5-TRINITROBENZENE	820.17	103	000099-35-4
104	CHLOROBENZENE	819.69	105	000108-90-7
105	RADON	817.89	104	010043-92-2
106	RADIUM-228	816.76	106	015262-20-1
107	THORIUM-230	814.72	107	014269-63-7
107	URANIUM-235	814.72	107	015117-96-1
109	BARIUM	813.46	109	007440-39-3
110	FLUORANTHENE	812.40	113	000206-44-0
111	URANIUM-234	812.11	110	013966-29-5
112	N-NITROSODI-N-PROPYLAMINE	811.05	111	000621-64-7
113	THORIUM-228	810.36	112	014274-82-9
114	RADON-222	809.78	114	014859-67-7
115	HEXACHLOROCYCLOHEXANE, ALPHA-	809.56	116	000319-84-6
116	1,2,3-TRICHLOROBENZENE	808.41	143	000087-61-6
117	MANGANESE	807.90	115	007439-96-5
118	COAL TARS	807.07	117	008007-45-2
119	CHRYSOTILE ASBESTOS	806.68	119	012001-29-5
119	STRONTIUM-90	806.68	119	010098-97-2
121	PLUTONIUM-239	806.67	118	015117-48-3
122	POLONIUM-210	806.39	122	013981-52-7
123	METHYLMERCURY	806.39	121	022967-92-6
124	PLUTONIUM-238	806.01	123	013981-16-3
125	LEAD-210	805.90	124	014255-04-0
126	PLUTONIUM	805.23	125	007440-07-5
127	CHLORPYRIFOS	804.93	125	002921-88-2
128	COPPER	804.86	133	007440-50-8
129	AMERICIUM-241	804.55	128	086954-36-1
130	RADON-220	804.54	127	022481-48-7
131	AMOSITE ASBESTOS	804.07	129	012172-73-5
132	IODINE-131	803.48	130	010043-66-0
133	HYDROGEN CYANIDE	803.08	132	000074-90-8
134	TRIBUTYLTIN	802.61	131	000688-73-3
135	GUTHION	802.32	134	000086-50-0
136	NEPTUNIUM-237	802.13	135	013994-20-2
137	CHRYSENE	802.10	139	000218-01-9
138	CHLORDECONE	801.64	136	000143-50-0
138	IODINE-129	801.64	136	015046-84-1
138	PLUTONIUM-240	801.64	136	014119-33-6
141	S,S,S-TRIBUTYL PHOSPHOROTRITHIOATE	797.88	140	000078-48-8
142	BROMINE	789.15	142	007726-95-6
143	POLYBROMINATED BIPHENYLS	789.11	141	067774-32-7
144	DICOFOL	787.56	144	000115-32-2
145	PARATHION	784.14	145	000056-38-2
146	1,1,2,2-TETRACHLOROETHANE	782.15	146	000079-34-5

147	SELENIUM	778.98	147	007782-49-2
148	HEXACHLOROCYCLOHEXANE, TECHNICAL GRADE	774.91	148	000608-73-1
149	TRICHLOROFLUOROETHANE	770.74	149	027154-33-2
150	TRIFLURALIN	770.12	150	001582-09-8
151	DDD, O,P'-	768.73	151	000053-19-0
152	4,4'-METHYLENEBIS(2-CHLOROANILINE)	766.66	152	000101-14-4
153	HEXACHLORODIBENZO-P-DIOXIN	760.42	153	034465-46-8
154	HEPTACHLORODIBENZO-P-DIOXIN	754.47	154	037871-00-4
155	PENTACHLOROBENZENE	753.58	155	000608-93-5
156	1,3-BUTADIENE	747.31	201	000106-99-0
157	AMMONIA	745.55	156	007664-41-7
158	2-METHYLNAPHTHALENE	743.24	157	000091-57-6
159	1,4-DICHLOROBENZENE	737.32	159	000106-46-7
160	1,1-DICHLOROETHANE	736.23	158	000075-34-3
161	ACENAPHTHENE	731.25	160	000083-32-9
162	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN	726.14	161	039001-02-0
163	1,1,2-TRICHLOROETHANE	724.96	162	000079-00-5
164	TRICHLOROETHANE	723.32	163	025323-89-1
165	HEXACHLOROCYCLOPENTADIENE	719.01	164	000077-47-4
166	HEPTACHLORODIBENZOFURAN	718.58	165	038998-75-3
167	1,2-DIPHENYLHYDRAZINE	713.90	166	000122-66-7
168	2,3,4,7,8-PENTACHLORODIBENZOFURAN	710.71	167	057117-31-4
169	TETRACHLOROBIPHENYL	709.21	168	026914-33-0
170	CRESOL, PARA-	707.83	169	000106-44-5
171	OXYCHLORDANE	706.32	170	027304-13-8
172	1,2-DICHLOROBENZENE	704.91	171	000095-50-1
173	1,2-DICHLOROETHENE, TRANS-	704.04	178	000156-60-5
174	INDENO(1,2,3-CD)PYRENE	703.30	180	000193-39-5
175	GAMMA-CHLORDENE	702.59	172	056641-38-4
176	CARBON DISULFIDE	702.55	174	000075-15-0
177	TETRACHLOROPHENOL	702.54	173	025167-83-3
178	AMERICIUM	701.62	175	007440-35-9
178	URANIUM-233	701.62	175	013968-55-3
180	PALLADIUM	700.66	177	007440-05-3
181	HEXACHLORODIBENZOFURAN	700.56	179	055684-94-1
182	PHENOL	696.96	183	000108-95-2
183	CHLOROETHANE	693.90	182	000075-00-3
184	ACETONE	693.31	181	000067-64-1
185	P-XYLENE	690.20	185	000106-42-3
186	DIBENZOFURAN	689.19	187	000132-64-9
187	ALUMINUM	688.13	186	007429-90-5
188	2,4-DIMETHYLPHENOL	685.76	189	000105-67-9
189	CARBON MONOXIDE	684.49	188	000630-08-0
190	TETRACHLOROETHANE	677.97	190	025322-20-7
191	HYDROGEN SULFIDE	676.51	193	007783-06-4
192	PENTACHLORODIBENZOFURAN	673.21	192	030402-15-4
193	CHLOROMETHANE	670.19	191	000074-87-3
194	BIS(2-METHOXYETHYL) PHTHALATE	666.08	194	034006-76-3
195	BUTYL BENZYL PHTHALATE	659.38	195	000085-68-7
196	CRESOL, ORTHO-	658.66	196	000095-48-7
197	HEXACHLOROETHANE	653.10	199	000067-72-1
198	VANADIUM	651.70	198	007440-62-2

199	N-NITROSODIMETHYLAMINE	650.71	200	000062-75-9
200	1,2,4-TRICHLOROBENZENE	647.30	203	000120-82-1
201	BROMOFORM	643.53	202	000075-25-2
202	TETRACHLORODIBENZO-P-DIOXIN	635.74	204	041903-57-5
203	1,3-DICHLOROBENZENE	631.41	205	000541-73-1
204	PENTACHLORODIBENZO-P-DIOXIN	625.12	207	036088-22-9
205	N-NITROSODIPHENYLAMINE	624.79	208	000086-30-6
206	1,2-DICHLOROETHYLENE	622.49	206	000540-59-0
207	2,3,7,8-TETRACHLORODIBENZOFURAN	622.15	210	051207-31-9
208	2-BUTANONE	620.01	209	000078-93-3
209	2,4-DICHLOROPHENOL	616.45	212	000120-83-2
210	1,4-DIOXANE	616.29	215	000123-91-1
211	FLUORINE	613.28	214	007782-41-4
212	NITRITE	612.64	216	014797-65-0
213	CESIUM-137	612.50	217	010045-97-3
214	SILVER	612.19	213	007440-22-4
215	CHROMIUM TRIOXIDE	610.85	218	007738-94-5
216	NITRATE	610.66	219	014797-55-8
217	POTASSIUM-40	608.91	220	013966-00-2
218	DINITROTOLUENE	607.65	221	025321-14-6
219	ANTIMONY	605.37	222	007440-36-0
220	COAL TAR PITCH	605.33	224	065996-93-2
221	THORIUM-227	605.32	223	015623-47-9
222	2,4,5-TRICHLOROPHENOL	604.83	225	000095-95-4
223	ARSENIC ACID	604.45	226	007778-39-4
224	ARSENIC TRIOXIDE	604.36	227	001327-53-3
225	PHORATE	603.10	228	000298-02-2
226	BENZOPYRENE	603.00	230	073467-76-2
227	CRESOLS	602.74	229	001319-77-3
228	CHLORDANE, TECHNICAL	602.62	231	012789-03-6
229	DIMETHOATE	602.61	232	000060-51-5
230	ACTINIUM-227	602.57	233	014952-40-0
230	STROBANE	602.57	233	008001-50-1
232	4-AMINOBIPHENYL	602.51	235	000092-67-1
232	PYRETHRUM	602.51	235	008003-34-7
234	ARSINE	602.42	237	007784-42-1
235	NALED	602.32	238	000300-76-5
236	DIBENZOFURANS, CHLORINATED	602.13	239	042934-53-2
236	ETHOPROP	602.13	239	013194-48-4
238	ALPHA-CHLORDENE	601.94	241	056534-02-2
238	CARBOPHENOTHION	601.94	241	000786-19-6
240	DICHLORVOS	601.64	243	000062-73-7
241	CALCIUM ARSENATE	601.45	244	007778-44-1
241	MERCURIC CHLORIDE	601.45	244	007487-94-7
241	SODIUM ARSENITE	601.45	244	007784-46-5
244	FORMALDEHYDE	599.64	247	000050-00-0
245	2-CHLOROPHENOL	599.62	248	000095-57-8
246	PHENANTHRENE	597.68	249	000085-01-8
247	HYDROGEN FLUORIDE	588.03	250	007664-39-3
248	2,4-D ACID	584.47	251	000094-75-7
249	DIBROMOCHLOROMETHANE	580.59	252	000124-48-1
250	DIURON	579.16	253	000330-54-1
251	BUTYLATE	578.43	254	002008-41-5

252	DIMETHYL FORMAMIDE	578.23	255	000068-12-2
253	PYRENE	577.95	256	000129-00-0
254	DICHLOROBENZENE	577.70	211	025321-22-6
255	ETHYL ETHER	572.47	257	000060-29-7
256	DICHLOROETHANE	570.46	258	001300-21-6
257	4-NITROPHENOL	567.79	259	000100-02-7
258	1,3-DICHLOROPROPENE, CIS-	561.82	184	010061-01-5
259	PHOSPHINE	559.74	260	007803-51-2
260	TRICHLOROBENZENE	557.96	261	012002-48-1
261	2,6-DINITROTOLUENE	555.20	262	000606-20-2
262	FLUORIDE ION	549.64	263	016984-48-8
263	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-P-DIOXIN	547.90	264	035822-46-9
264	METHYL PARATHION	545.83	265	000298-00-0
265	PENTAERYTHRITOL TETRANITRATE	545.59	266	000078-11-5
266	1,3-DICHLOROPROPENE, TRANS-	543.37	267	010061-02-6
267	BIS(2-ETHYLHEXYL)ADIPATE	540.20	268	000103-23-1
268	CARBAZOLE	534.52	269	000086-74-8
269	METHYL ISOBUTYL KETONE	533.24	271	000108-10-1
270	1,2-DICHLOROETHENE, CIS-	533.15	270	000156-59-2
271	STYRENE	532.70	272	000100-42-5
272	CARBARYL	530.98	273	000063-25-2
273	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	529.45	274	067562-39-4
274	ACRYLONITRILE	528.28	275	000107-13-1
275	1-METHYLNAPHTHALENE	526.51	NEW	

Substances were assigned the same rank when two (or more) substances received equivalent total point scores.

CAS #= Chemical Abstracts Service Registry Number

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APPENDIX 6
SUSTAINABILITY STATEMENT

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

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

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.

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.

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

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

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

Recontamination Control. Recontamination after cleanup and redevelopment is completed undermines the value of work performed, may result in a property that is less protective of public health or the environment, and may necessitate additional cleanup work later or impede future

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

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

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

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

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

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

Paperless Cleanup Program. Hello Living / Hello Flatbush, LLC is participating in OER's Paperless 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. Hello Living / Hello Flatbush, 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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Trees and Plantings. Trees and other plantings provide habitat and add to NYC's environmental quality in a wide variety of ways. Native plant species and native habitat provide optimal support to local fauna, promote local biodiversity, and require less maintenance.

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