200 EAST 135TH STREET

BRONX, NEW YORK

Remedial Action Work Plan

& STIP List (11/6/2015)

NYC VCP Number: 16CVCP013X
E-Designation Site Number: 13EHAN270X

Prepared for:

Chess Builders LLC
63 Flushing Avenue, 4th Floor
Brooklyn, New York
cschwimmer@cgsbuilders.com

Prepared by:

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NOVEMBER 2015

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October 20, 2015

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 # 16CVCP013X
E-Designation # 13EHAN270X
200 East 135th Street, Bronx, New York 10451
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 Chess Builders, 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 the site contains hazardous waste that will be excavated and disposed of offsite, OER will work with the development team to seek an exemption for your property from the $130/ton state Hazardous Waste Program Fee. To qualify for an exemption, the 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 the supervising OER Project Manager and Shaminder Chawla, before hazardous waste is shipped from the site. Unless the Department of Environmental Conservation is notified before waste is shipped from the site, an exemption from the fee may not be received. The exemption does not cover, and the development team may remain liable for, the Special Assessment on Hazardous Waste (established by ECL§ 27-0923) that 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 confirmation samples from the bottom of excavation to evaluate the performance of the remedy with respect to attainment of Track 4 SCOs. Confirmation samples will be analyzed for contaminants of concern SVOCs and Metals.

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 5**.

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 6**

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 7**.

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 8**.

11. A 46-mil waterproofing/vapor barrier will be installed beneath the structure's slab and extended up to grade level by attaching it the exterior of foundation sidewalls using a 32-mil vapor barrier. The barriers chosen for this project are manufactured by Grace Preprufe®, 300R & 160R. **Appendix 9** provides manufactures specifications and PE/RA certified building plans with the extent of the vapor barrier installation details (penetrations, joints, etc.) with respect to the proposed foundation, footings, etc.

12. The cellar level (25% of the site) will be excavated down to 10 feet and the building footprint of the remainder of the building will be excavated down to 2 feet. The rest of the site will be excavated to 2 feet and will be capped with asphalt to provide open air parking spaces. The proposed excavation plan is provided in **Appendix 10**.

13. An engineered composite site cover will be placed over the entire footprint of the Site. The composite cover system will be comprised of concrete foundation/slabs. Drawings of the composite site cover are provided as **Appendix 11**.

14. Dewatering will be performed in full compliance with applicable laws, rules and regulations. Dewatering permit will be obtained from NYCDEP prior to construction activities.

15. Development plans are attached in **Appendix 12.**

16. The stamped/signed RAWP certification page is included in **Appendix 13.**

17. The GPR Report is included in **Appendix 14**.

Sincerely,
Hydro Tech Environmental, Corp.

Andrew Infante
Project Geologist

AI/ph
Enc.

cc: Sarah Pong, NYCOER, w/ Enc.
Hydro Tech Job #150213 w/ Enc.
Cheskel Schwimmer w/ Enc.

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 indentified 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

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

Date: _____

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:

200 East 135th Street, Bronx, New York 10451
OER Site # 16CVCP013X

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

200 East 135th Street
Site #: 16CVCP013X

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

PlaNYC

NYC Office of Environmental Remediation

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
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.

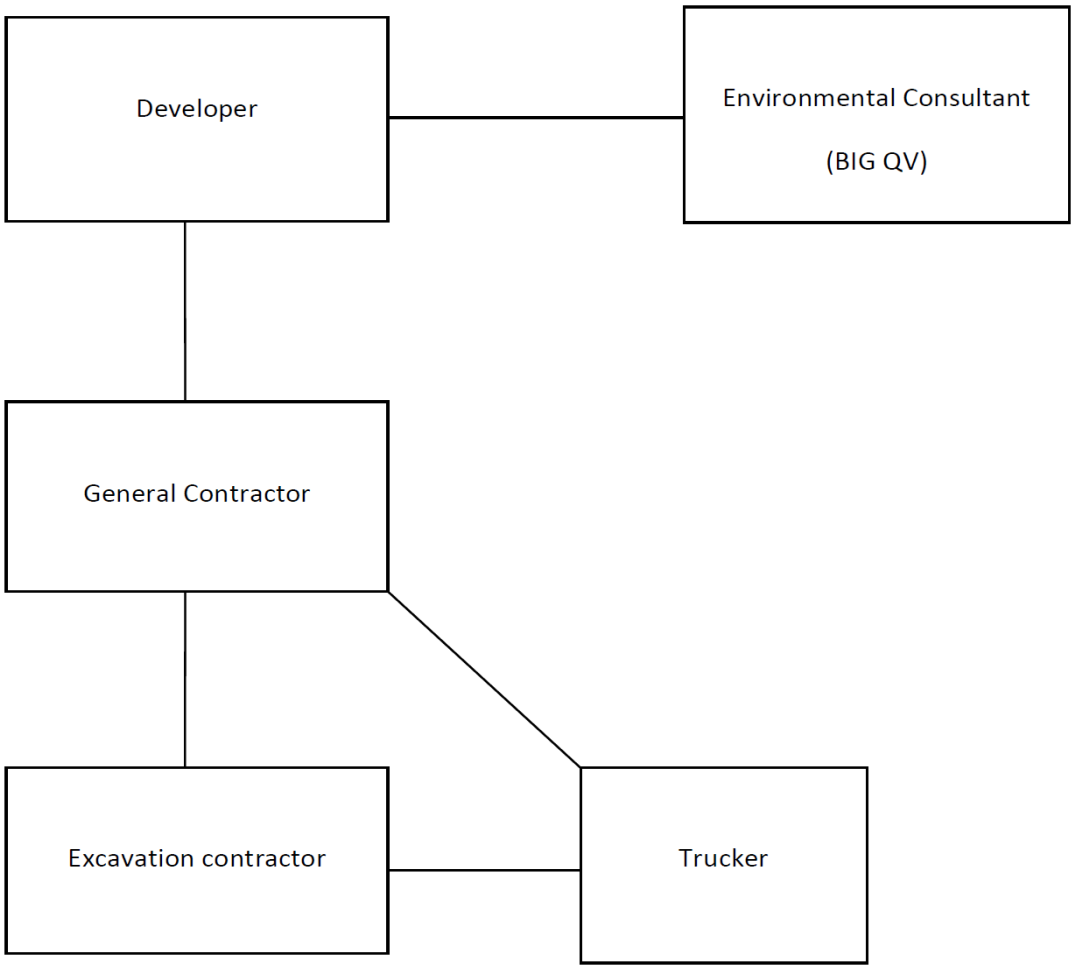
- Its environmental consultant(s) hired to oversee the cleanup must be:
  a. a BIG Qualifed Vendor; and
  b. maintain Professional Liability (PL) insurance of $1M per claim and annual aggregate.

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 6
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 Or Liquid	Facility # Name Location Type of Waste Solid *Or* Liquid		Facility # Name Location Type of Waste Solid *Or* Liquid		Facility # Name Location Type of Waste Solid *Or* Liquid		Facility # Name Location Type of Waste Solid *Or* Liquid		# # # # # # # Clean Earth Carteret, NJ petroleum soils Solid	
(Trucks, Cu.Yds. Or Gallons)	Trucks	Cu. Yds. *Or* Gallons	Trucks	Cu. Yds. *Or* Gallons	Trucks	Cu. Yds. *Or* Gallons	Trucks	Cu. Yds. *Or* 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

Site Grid Map

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 7
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 9

Vapor Barrier Manufacturer Specifications and Installation Details

GRACE

PREPRUFE® 300R & 160R

Pre-applied waterproofing membranes that bond integrally to poured concrete for use below slabs or behind basement walls on confined sites

Description

Preprufe® 300R & 160R membranes are unique composite sheets comprising a thick HDPE film, an aggressive pressure sensitive adhesive and a weather resistant protective coating.

Unlike conventional non-adhering membranes, which are vulnerable to water ingress tracking between the unbonded membrane and structure, the unique Preprufe bond to concrete prevents ingress or migration of water around the structure.

The Preprufe R System includes:

- **Preprufe 300R**—heavy-duty grade for use below slabs and on rafts (i.e. mud slabs). Designed to accept the placing of heavy reinforcement using conventional concrete spacers.
- **Preprufe 160R**—thinner grade for blindside, zero property line applications against soil retention systems.
- **Preprufe Tape LT**—for covering cut edges, roll ends, penetrations and detailing (temperatures between 25°F (-4°C) and 86°F (+30°C)).
- **Preprufe Tape HC**—as above for use in Hot Climates (minimum 50°F (10°C)).
- **Bituthene® Liquid Membrane**—for sealing around penetrations, etc.

Preprufe 300R & 160R membranes are applied either horizontally to smooth prepared concrete, carton forms or well rolled and compacted sand or crushed stone substrate; or vertically to permanent formwork or adjoining structures. Concrete is then cast directly against the adhesive side of the membranes. The specially developed Preprufe adhesive layers work together to form a continuous and integral seal to the structure.

Preprufe can be returned up the inside face of slab formwork but is not recommended for conventional twin-sided formwork on walls, etc. Use Bituthene self-adhesive membrane or Procor® fluid applied membrane to walls after removal of formwork for a fully bonded system to all structural surfaces.

Advantages

- **Forms a unique continuous adhesive bond to concrete poured against it**—prevents water migration and makes it unaffected by ground settlement beneath slabs
- **Fully-adhered watertight laps** and detailing
- **Provides a barrier to water, moisture and gas**—physically isolates the structure from the surrounding ground
- **BBA Certified** for basement Grades 2, 3, & 4 to BS 8102:1990
- **Zero permeance** to moisture
- **Solar reflective**—reduced temperature gain
- **Simple and quick to install**—requiring no priming or fillets
- **Can be applied to permanent formwork**—allows maximum use of confined sites
- **Self protecting**—can be trafficked immediately after application and ready for immediate placing of reinforcement
- **Unaffected by wet conditions**—cannot activate prematurely
- Inherently waterproof, non-reactive system:
  - not reliant on confining pressures or hydration
  - unaffected by freeze/thaw, wet/dry cycling
- **Chemical resistant**—effective in most types of soils and waters, protects structure from salt or sulphate attack

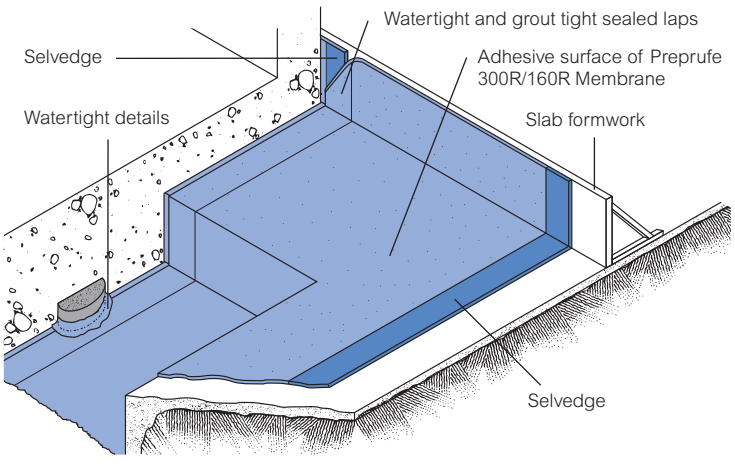
Installation

The most current application instructions, detail drawings and technical letters can be viewed at www.graceconstruction.com. Technical letters are provided for the following subjects to assist in the installation of Preprufe:

- Chemical Resistance
- Minimizing Concrete Shrinkage and Curling
- Rebar Chairs on Preprufe 300R Membrane
- Removal of Formwork Placed Against Preprufe Membranes
- Winter Lap Sealing and the use of Preprufe Tape LT

For other technical information contact your local Grace representative.

Preprufe 300R & 160R membranes are supplied in rolls 4 ft (1.2 m) wide, with a selvedge on one side to provide self-adhered laps for continuity between rolls. The rolls of Preprufe Membrane and Preprufe Tape are interwound with a disposable plastic release liner which must be removed before placing reinforcement and concrete.



Drawings are for illustration purposes only.
Please refer to www.graceconstruction.com for specific application details.

BBA BRITISH BOARD OF AGREMENT CERTIFICATE No. 97/3325

Substrate Preparation

All surfaces—It is essential to create a sound and solid substrate to eliminate movement during the concrete pour. Substrates must be regular and smooth with no gaps or voids greater than 0.5 in. (12 mm). Grout around all penetrations such as utility conduits, etc. for stability (see Figure 1).

Horizontal—The substrate must be free of loose aggregate and sharp protrusions. Avoid curved or rounded substrates. The surface does not need to be dry, but standing water must be removed.

Vertical—Use concrete, plywood, insulation or other approved facing to sheet piling to provide support to the membrane. Board systems such as timber lagging must be close butted to provide support and not more than 0.5 in. (12 mm) out of alignment.

Membrane Installation

Preprufe can be applied at temperatures of 25°F (-4°C) or above. When installing Preprufe in cold or marginal weather conditions 55°F (<13°C) the use of Preprufe Tape LT is recommended at all laps and detailing. Preprufe Tape LT should be applied to clean, dry surfaces and the release liner must be removed immediately after application.

Horizontal substrates—Place the membrane HDPE film side to the substrate with the clear plastic release liner facing towards the concrete pour. End laps should be staggered to avoid a build up of layers. Leave plastic release liner in position until overlap procedure is completed (see Figure 2).

Accurately position succeeding sheets to overlap the previous sheet 3 in. (75 mm) along the marked selvedge. Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap. Peel back the plastic release liner from between the overlaps as the two layers are bonded together. Ensure a continuous bond is achieved without creases and roll firmly with a heavy roller. Completely remove the plastic liner to expose the protective coating. Any initial tack will quickly disappear.

Refer to Grace Tech Letters for information on suitable rebar chairs for Preprufe.

Vertical substrates—Mechanically fasten the membrane vertically using fasteners appropriate to the substrate with the the clear plastic release liner facing towards the concrete pour. The membrane may be installed in any convenient length. Secure the top of the membrane using a batten such as a termination bar or similar 2 in. (50 mm) below the top edge (see Figure 3). Fastening can be made through the selvedge so that the membrane lays flat and allows firmly rolled overlaps. Immediately remove the plastic release liner. Any additional fasteners must be covered with a patch of Preprufe Tape (see Figure 4).

Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap. Roll firmly to ensure a watertight seal.

Roll ends and cut edges—Overlap all roll ends and cut edges by a minimum 3 in. (75 mm) and ensure the area is clean and free from contamination, wiping with a damp cloth if necessary. Allow to dry and apply Preprufe Tape LT (or HC in hot climates) centered over the lap and roll firmly. Immediately remove printed plastic release liner from the tape.

Details

Refer to Preprufe Field Application Manual, Section V Application Instructions or visit www.graceconstruction.com. This Manual gives comprehensive guidance and standard details for:

- internal and external corners
- penetrations
- tiebacks
- columns
- grade beam pilecaps
- tie-ins
- terminations

Membrane Repair

Inspect the membrane before installation of reinforcement steel, formwork and final placement of concrete. The membrane can be easily cleaned by jet washing if required. Repair damage by wiping the area with a damp cloth to ensure the area is clean and free from dust, and allow to dry. Repair small punctures (0.5 in. (12 mm) or less) and slices by applying Preprufe Tape centered over the damaged area and roll firmly. Remove the release liner from the tape. Repair holes and large punctures by applying a patch of Preprufe membrane, which extends 6 in. (150 mm) beyond the damaged area. Seal all edges of the patch with Preprufe Tape, remove the release liner from the tape and roll firmly. Any areas of damaged adhesive should be covered with Preprufe Tape. Remove printed plastic release liner from tape. Where exposed selvedge has lost adhesion or laps have not been sealed, ensure the area is clean and dry and cover with fresh Preprufe Tape, rolling firmly. Alternatively, use a hot air gun or similar to activate adhesive and firmly roll lap to achieve continuity.

Pouring of Concrete

Ensure the plastic release liner is removed from all areas of Preprufe R Membrane and Tape.

It is recommended that concrete be poured within 56 days (42 days in hot climates) of application of the membrane. Concrete must be placed and compacted carefully to avoid damage to the membrane. Never use a sharp object to consolidate the concrete.

Removal of Formwork

Preprufe membranes can be applied to removable formwork, such as slab perimeters, elevator and lift pits, etc. Once the concrete is poured the formwork must remain in place until the concrete has gained sufficient compressive strength to develop the surface bond. Preprufe membranes are not recommended for conventional twin-sided wall forming systems.

A minimum concrete compressive strength of 1500 psi (10 N/mm^2) is recommended prior to stripping formwork supporting Preprufe membranes. Premature stripping may result in displacement of the membrane and/or spalling of the concrete.

As a guide, to reach the minimum compressive strength stated above, a structural concrete mix with an ultimate strength of 6000 psi (40 N/mm^2) will typically require a cure time of approximately 6 days at an average ambient temperature of 25°F (-4°C), or 2 days at 70°F (21°C).

Figure 1

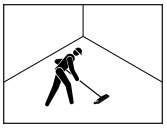


Figure 2

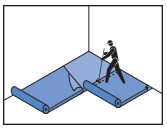
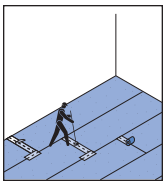
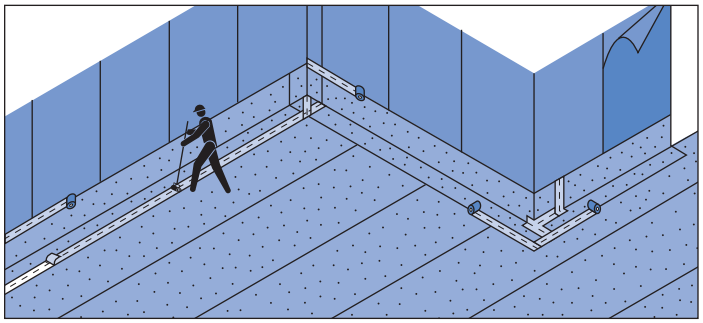


Figure 3

Figure 4

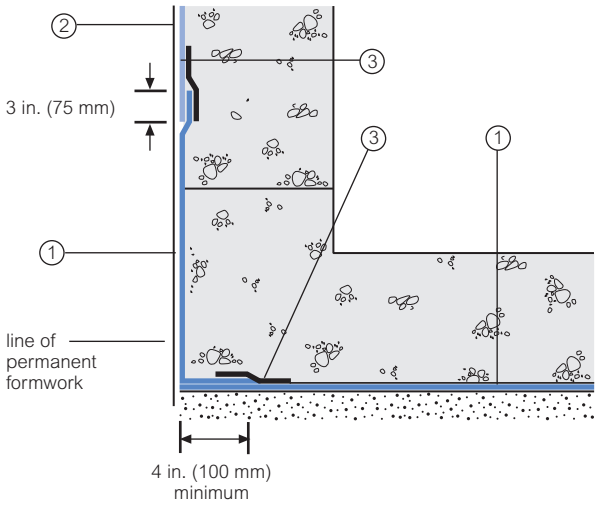




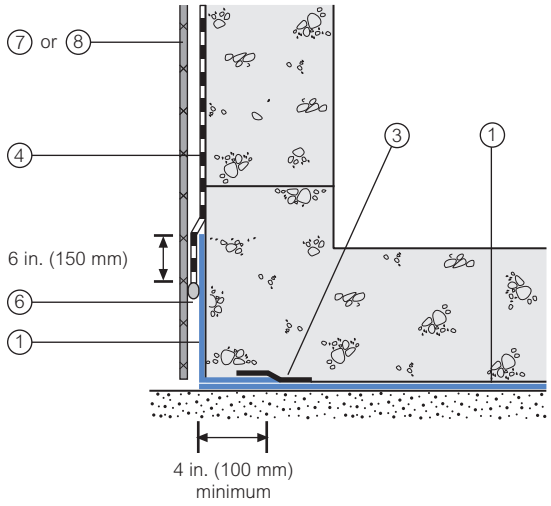
Detail Drawings

Details shown are typical illustrations and not working details. For a list of the most current details, visit us at www.graceconstruction.com. For technical assistance with detailing and problem solving please call toll free at 866-333-3SBM (3726).

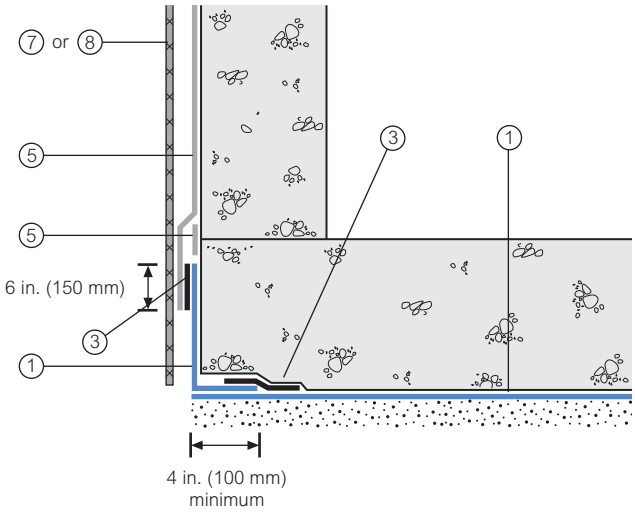
Wall base detail against permanent shutter



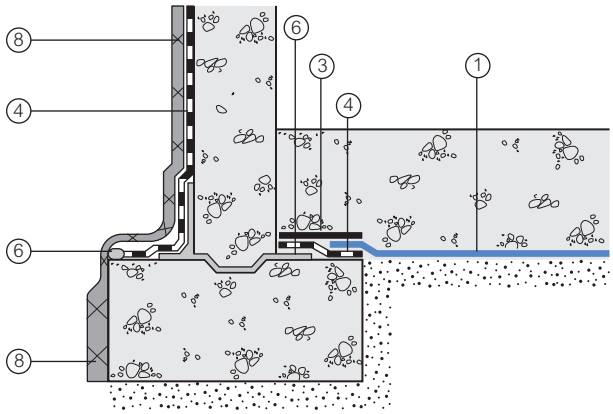
Bituthene wall base detail (Option 1)



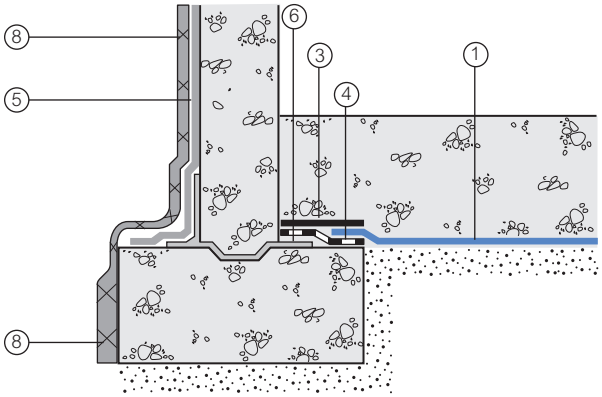
Procor wall base detail (Option 1)



Bituthene wall base detail (Option 2)



Procor wall base detail (Option 2)



1 Preprufe 300R
2 Preprufe 160R
3 Preprufe Tape
4 Bituthene
5 Procor
6 Bituthene Liquid Membrane
7 Protection
8 Hydroduct®

Supply

Dimensions (Nominal)	Preprufe 300R Membrane	Preprufe 160R Membrane	Preprufe Tape (LT or HC*)
Thickness	0.046 in. (1.2 mm)	0.032 in. (0.8 mm)	
Roll size	4 ft x 98 ft (1.2 m x 30 m)	4 ft x 115 ft (1.2 m x 35 m)	4 in. x 49 ft (100 mm x 15 m)
Roll area	392 ft^2 (36 m^2)	460 ft^2 (42 m^2)	
Roll weight	108 lbs (50 kg)	92 lbs (42 kg)	4.3 lbs (2 kg)
Minimum side/end laps	3 in. (75 mm)	3 in. (75 mm)	3 in. (75 mm)
* LT denotes Low Temperature (between 25°F (-4°C) and 86°F (+30°C)) HC denotes Hot Climate (50°F (>+10°C))			
Ancillary Products			
Bituthene Liquid Membrane—1.5 US gal (5.7 liter) or 4 US gal (15.1 liter)			

Physical Properties

Property	Typical Value 300R	Typical Value 160R	Test Method
Color	white	white	
Thickness	0.046 in. (1.2 mm) nominal	0.032 in. (0.8 mm) nominal	ASTM D3767
Low temperature flexibility	Unaffected at -10°F (-23°C)	Unaffected at -10°F (-23°C)	ASTM D1970
Resistance to hydrostatic head, minimum	231 ft (70 m)	231 ft (70 m)	ASTM D5385, modified[1]
Elongation, minimum	300%	300%	ASTM D412, modified[2]
Tensile strength, film, minimum	4000 psi (27.6 MPa)	4000 psi (27.6 MPa)	ASTM D412
Crack cycling at -10°F (-23°C), 100 cycles	Unaffected	Unaffected	ASTM C836
Puncture resistance, minimum	221 lbs (990 N)	100 lbs (445 N)	ASTM E154
Peel adhesion to concrete, minimum	5.0 lbs/in. (880 N/m) width	5.0 lbs/in. (880 N/m) width	ASTM D903, modified[3]
Lap peel adhesion	2.5 lbs/in. (440 N/m) width	2.5 lbs/in. (440 N/m) width	ASTM D1876, modified[4]
Permeance to water vapor transmission, maximum	0.01 perms (0.6 ng/(Pa × s × m^2))	0.01 perms (0.6 ng/(Pa × s × m^2))	ASTM E96, method B
Water absorption, maximum	0.5%	0.5%	ASTM D570
Methane permeability	9.1 mls/m^2/day	N/A	University of London, QMW College[3]
Permeability[5] (hydraulic conductivity)	K=<1.4 x 10^{-11}cm.s^{-1}	K=<1.4 x 10^{-11}cm.s^{-1}	ASTM D5084-90

Footnotes:

1. Hydrostatic head tests of Preprufe Membranes are performed by casting concrete against the membrane with a lap. Before the concrete cures, a 0.125 in. (3 mm) spacer is inserted perpendicular to the membrane to create a gap. The cured block is placed in a chamber where water is introduced to the membrane surface up to the head indicated.
2. Elongation of membrane is run at a rate of 2 in. (50 mm) per minute.
3. Concrete is cast against the protective coating surface of the membrane and allowed to properly dry (7 days minimum). Peel adhesion of membrane to concrete is measured at a rate of 2 in. (50 mm) per minute at room temperature.
4. The test is conducted 15 minutes after the lap is formed (per Grace published recommendations) and run at a rate of 2 in. (50 mm) per minute at 25°F (-4°C).
5. Result is lower limit of apparatus. Membrane therefore considered impermeable.

Specification Clauses

Preprufe 300R or 160R shall be applied with its adhesive face presented to receive fresh concrete to which it will integrally bond. Only Grace Construction Products approved membranes shall be bonded to Preprufe 300R/160R. All Preprufe 300R/160R system materials shall be supplied by Grace Construction Products, and applied strictly in accordance with their instructions.

Specimen performance and formatted clauses are also available.

NOTE: Use Preprufe Tape to tie-in Procor with Preprufe.

Health and Safety

Refer to relevant Material Safety data sheet. Complete rolls should be handled by a minimum of two persons.

www.graceconstruction.com

For technical assistance call toll free at 866-333-3SBM (3726)

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GRACE

Construction & Development

Grace Waterproofing Systems

PREPRUFE® TAPE and PREPRUFE® CJ TAPE

Description

Preprufe® Tape and Preprufe® CJ Tape are specially formulated two sided, reinforced pressure sensitive tapes. The bottom side of the tape has a highly aggressive pressure sensitive adhesive which is designed to adhere to penetrations, protrusions and Grace waterproofing membranes and accessories. The top side of the tape has a pressure sensitive adhesive, a weather resistant protective coating an a release liner. Concrete is cast directly against the top adhesive side of the tape. The specially developed Preprufe adhesive layers work together to form a continuous and integral seal to the structure.

Preprufe Tape and Preprufe CJ Tape are provided in Low Temperature and Hot Climate Grades as follows:

- **Preprufe Tape LT Grade and Preprufe CJ Tape LT Grade**—for temperatures between 25°F (-4°C) and 86°F (+30°C).
- **Preprufe Tape HC Grade and Preprufe CJ Tape HC Grade**—for use in Hot Climates (minimum 50°F (10°C)).

Use

Preprufe Tape is a 4 in. (100 mm) wide tape used in detail areas including end laps, penetrations and various tie-ins. It is also used to patch damaged areas in the Preprufe membranes.

Preprufe CJ Tape is an 8 in. (200 mm) wide tape used at construction joints in the concrete that is cast against it or in critical areas where a wider tape is required.

Application

Wipe substrates to receive Preprufe Tape and Preprufe CJ Tape clean to remove any dirt, dust or moisture. Clean the surface of penetrations or protrusions with a wire brush to remove dirt, dust, rust and loose particles.

Unroll the tape and adhere the exposed pressure sensitive adhesive surface to the membrane or penetration. The protective coating surface of the tape should face toward the concrete to be cast onto the tape.

Use heavy hand pressure or a hand roller to maximize adhesion. Remove the release liner during application.

Ensure the plastic release liner is removed from all areas of Preprufe Tape and Preprufe CJ Tape. It is recommended that concrete be poured within 56 days (42 days in hot climates) of application of the tape. Following proper ACI guidelines, concrete must be placed carefully and consolidated properly to avoid damage to the membrane. Never use a sharp object to consolidate the concrete. Provide temporary protection from concrete over splash for areas of the tape that are adjacent to a concrete pour.

Dimensions (Nominal)	Preprufe Tape (HC or LT)	Preprufe CJ Tape (HC or LT)
Roll Size	4 in. x 49 ft. (100 mm x 15 m)	8 in. x 49 ft. (200 mm x 15 m)
Roll Weight	4.3 lbs (2 kg)	8.6 lbs (4 kg)

www.graceconstruction.com

For technical assistance call toll free at 866-333-3SBM (3726)

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GRACE

Bituthene® System 4000

Self-adhesive HDPE waterproofing membrane with super tacky compound for use with patented, water-based System 4000 Surface Conditioner

Advantages

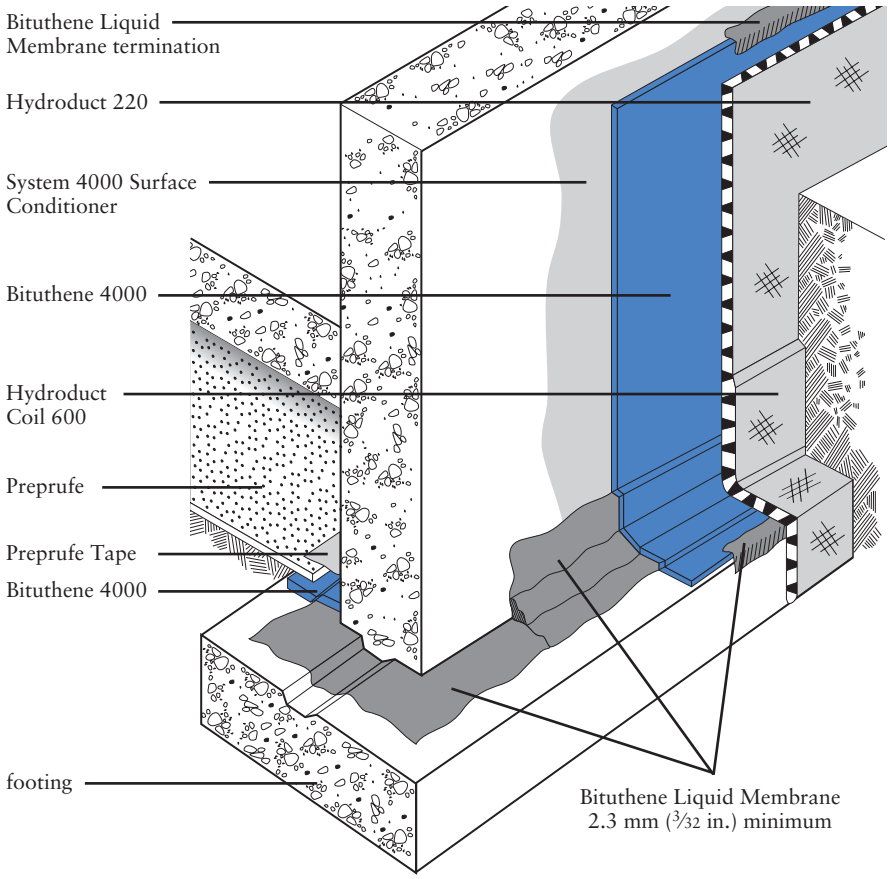
- **Excellent adhesion** – special adhesive compound engineered to work with high tack System 4000 Surface Conditioner
- **Cold applied** – simple application to substrates, especially at low temperatures
- **Reduced inventory and handling costs** – System 4000 Surface Conditioner is included with each roll of membrane
- **Wide application temperature range** – excellent bond to self and substrate from -4°C (25°F) and above
- **Overlap security** – minimizes margin for error under site conditions
- **Cross laminated, high density polyethylene carrier film** – provides high tear strength, puncture and impact resistance
- **Flexible** – accommodates minor structural movements and will bridge shrinkage cracks

Description

Bituthene® System 4000 is a 1.5 mm (1/16 in.) flexible, pre-formed waterproof membrane which combines a high performance, cross laminated, HDPE carrier film with a unique, super tacky, rubberized asphalt compound.

System 4000 Surface Conditioner is a unique, water-based, latex surface treatment which imparts an aggressive, high tack finish to the treated substrate. It is specifically formulated to bind site dust and concrete efflorescence, thereby providing a suitable surface for the Bituthene System 4000 Waterproofing Membrane.

Conveniently packaged in each roll of membrane, System 4000 Surface Conditioner promotes good initial adhesion and, more importantly, excellent permanent adhesion of the Bituthene System 4000 Waterproofing Membrane. The VOC (Volatile Organic Compound) content is 125 g/L.



GRACE Construction Products

Use

Bituthene is ideal for waterproofing concrete, masonry and wood surfaces where in-service temperatures will not exceed 57°C (135°F). It can be applied to foundation walls, tunnels, earth sheltered structures and split slab construction, both above and below grade. (For above grade applications, see "Above Grade Waterproofing Bituthene System 4000.")

Bituthene is 1.5 mm (1/16 in.) thick, 0.9 m (3 ft) wide and 20 m (66.7 ft) long and is supplied in rolls. It is unrolled sticky side down onto concrete slabs or applied onto vertical concrete faces primed with System 4000 Surface Conditioner. Continuity is achieved by overlapping a minimum 50 mm (2 in.) and firmly rolling the joint.

Bituthene is extremely flexible. It is capable of bridging shrinkage cracks in the concrete and will accommodate minor differential movement throughout the service life of the structure.

Application Procedures

Safety, Storage and Handling Information

Bituthene products must be handled properly. Vapors from solvent-based primers and mastic are harmful and flammable. Grace Protection Board Adhesive is extremely flammable. For these products, the best available information on safe handling, storage, personal protection, health and environmental considerations has been gathered. Material Safety Data Sheets (MSDS) are available at www.graceconstruction.com and users should acquaint themselves with this information. Carefully read detailed precaution statements on product labels and the MSDS before use.

Surface Preparation

Surfaces should be structurally sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Concrete must be properly dried (minimum 7 days for normal structural concrete and 14 days for lightweight structural concrete).

If time is critical, Bituthene Primer B2 may be used to allow priming and installation of membrane on damp surfaces or "green" concrete. Priming may begin in this case as soon as the concrete will maintain structural integrity. Use form release agents which will not transfer to the concrete. Remove forms as soon as possible from below horizontal slabs to prevent entrapment of excess moisture. Excess moisture may lead to blistering of the membrane. Cure concrete with clear, resin-based curing compounds which do not contain oil, wax or pigment. Except with Primer B2, allow concrete to thoroughly dry following rain. Do not apply any products to frozen concrete.

Repair defects such as spalled or poorly consolidated areas. Remove sharp protrusions and form match lines. On masonry surfaces, apply a parge coat to rough concrete block and brick walls or trowel cut mortar joints flush to the face of the concrete blocks.

Temperature

- Apply Bituthene System 4000 Membrane and Conditioner only in dry weather and when air and surface temperatures are -4°C (25°F) or above.
- Apply Bituthene Primer B2 in dry weather above -4°C (25°F). (See separate product information sheet.)

Conditioning

Bituthene System 4000 Surface Conditioner is ready to use and can be applied by spray or roller. For best results, use a pump-type air sprayer with fan tip nozzle, like the Bituthene System 4000 Surface Conditioner Sprayer, to apply the surface conditioner.

Apply Bituthene System 4000 Surface Conditioner to clean, dry, frost-free surfaces at a coverage rate of 7.4 m^2/L (300 ft^2/gal). Coverage should be uniform. Surface conditioner should not be applied so heavily that it puddles or runs. **Do not apply conditioner to Bituthene membrane.**

Allow Bituthene System 4000 Surface Conditioner to dry one hour or until substrate returns to its original color. At low temperatures or in high humidity conditions, dry time may be longer.

Bituthene System 4000 Surface Conditioner is clear when dry and may be slightly tacky. In general, conditioning should be limited to what can be covered within 24 hours. In situations where long dry times may prevail, substrates may be conditioned in advance. Substrates should be reconditioned if significant dirt or dust accumulates.

Before surface conditioner dries, tools should be cleaned with water. After surface conditioner dries, tools should be cleaned with mineral spirits. Mineral spirits is a combustible liquid which should be used only in accordance with manufacturer's recommendations. **Do not use solvents to clean hands or skin.**

Corner Details

The treatment of corners varies depending on the location of the corner. For detailed information on Bituthene Liquid Membrane, see separate product information sheet.

- At wall to footing inside corners –
  Option 1:
  Apply membrane to within 25 mm (1 in.) of base of wall. Treat the inside corner by installing a 20 mm (¾ in.) fillet of Bituthene Liquid Membrane. Extend Bituthene Liquid Membrane at least 65 mm (2½ in.) onto footing, and 65 mm (2½ in.) onto wall membrane.
  Option 2:
  Treat the inside corner by installing a 20 mm (¾ in.) fillet of Bituthene Liquid Membrane. Apply 300 mm (12 in.) wide strip of sheet membrane centered over fillet. Apply wall membrane over inside corner and extend 150 mm (6 in.) onto footing. Apply 25 mm (1 in.) wide troweling of Bituthene Liquid Membrane over all terminations and seams within 300 mm (12 in.) of corner.
- At footings where the elevation of the floor slab is 150 mm (6 in.) or more above the footing, treat the inside corner either by the above two methods or terminate the membrane at the base of the wall. Seal the termination with Bituthene Liquid Membrane.

Joints

Properly seal all joints with waterstop, joint filler and sealant as required. Bituthene membranes are not intended to function as the primary joint seal. Allow sealants to fully cure. Pre-strip all slab and wall cracks over 1.5 mm (1/16 in.) wide and all construction and control joints with 230 mm (9 in.) wide sheet membrane strip.

Application on Horizontal Surfaces

(Note: **Preprufe®** pre-applied membranes are strongly recommended for below slab or for any application where the membrane is applied before concreting. See Preprufe product information sheets.)

Apply membrane from the low point to the high point so that laps shed water. Overlap all seams at least 50 mm (2 in.). Stagger all end laps. Roll the entire membrane firmly and completely as soon as possible. Use a linoleum roller or standard water-filled garden roller less than 760 mm (30 in.) wide, weighing a minimum of 34 kg (75 lbs) when filled. Cover the face of the roller with a resilient material such as a 13 mm (½ in.) plastic foam or two wraps of indoor-outdoor carpet to allow the membrane to fully contact the primed substrate. Seal all T-joints and membrane terminations with Bituthene Liquid Membrane at the end of the day.

Protrusions and Drains

Apply membrane to within 25 mm (1 in.) of the base of the protrusion. Apply Bituthene Liquid Membrane 2.5 mm (0.1 in.) thick around protrusion. Bituthene Liquid Membrane should extend over the membrane a minimum of 65 mm (2½ in.) and up the penetration to just below the finished height of the wearing course.

Vertical Surfaces

Apply membrane in lengths up to 2.5 m (8 ft). Overlap all seams at least 50 mm (2 in.). On higher walls apply membrane in two or more sections with the upper overlapping the lower by at least 50 mm (2 in.). Roll all membrane with a hand roller.

Terminate the membrane at grade level. Press the membrane firmly to the wall with the butt end of a hardwood tool such as a hammer handle or secure into a reglet. Failure to use heavy pressure at terminations can result in a poor seal. A termination bar may be used to ensure a tight seal. Terminate the membrane at the base of the wall if the bottom of the interior floor slab is at least 150 mm (6 in.) above the footing. Otherwise, use appropriate inside corner detail where the wall and footing meet.

Membrane Repairs

Patch tears and inadequately lapped seams with membrane. Clean membrane with a damp cloth and dry. Slit fishmouths and repair with a patch extending 150 mm (6 in.) in all directions from the slit and seal edges of the patch with Bituthene Liquid Membrane. Inspect the membrane thoroughly before covering and make any repairs.

Drainage

Hydroduct® drainage composites are recommended for both active drainage and protection of the membrane. See Hydroduct product information sheets.

Protection of Membrane

Protect Bituthene membranes to avoid damage from other trades, construction materials or backfill. Place protection immediately in temperatures above 25°C (77°F) to avoid potential for blisters.

- On vertical applications, use Hydroduct 220 Drainage Composite. Adhere Hydroduct 220 Drainage Composite to membrane with Hydroduct Tape. Alternative methods of protection are to use 25 mm (1 in.) expanded polystyrene or 6 mm (¼ in.) extruded polystyrene that has a minimum compressive strength of 55 kN/m^2 (8 lbs/in.^{2}). Such alternatives do not provide positive drainage to the system.

If 6 mm (¼ in.) extruded polystyrene protection board is used, backfill should not contain sharp rock or aggregate over 50 mm (2 in.) in diameter. Adhere polystyrene protection board with Bituthene® Protection Board Adhesive or Hydroduct Tape.

- In mud slab waterproofing, or other applications where positive drainage is not desired and where reinforced concrete slabs are placed over the membrane, the use of 6 mm (¼ in.) hardboard or 2 layers of 3 mm (⅛ in.) hardboard is recommended.

Insulation

Always apply Bituthene membrane directly to primed or conditioned structural substrates. Insulation, if used, must be applied over the membrane. Do not apply Bituthene membranes over lightweight insulating concrete.

Backfill

Place backfill as soon as possible. Use care during backfill operation to avoid damage to the waterproofing system. Follow generally accepted practices for backfilling and compaction. Backfill should be added and compacted in 150 mm (6 in.) to 300 mm (12 in.) lifts.

For areas which cannot be fully compacted, a termination bar is recommended across the top termination of the membrane.

Placing Steel

When placing steel over properly protected membrane, use concrete bar supports (dobies) or chairs with plastic tips or rolled feet to prevent damage from sharp edges. Use special care when using wire mesh, especially if the mesh is curled.

Approvals

- City of Los Angeles Research Report RR 24386
- U.S. Department of Housing and Urban Development (HUD) HUD Materials Release 628E

Warranty

Five year material warranties covering Bituthene and Hydroduct products are available upon request. Contact your Grace sales representative for details.

Technical Services

Support is provided by full time, technically trained Grace representatives and technical service personnel, backed by a central research and development staff.

System 4000 Surface Conditioner Sprayer

The Bituthene System 4000 Surface Conditioner Sprayer is a professional grade, polyethylene, pump-type, compressed air sprayer with a brass fan tip nozzle. It has a 7.6 L (2 gal) capacity. The nozzle orifice and spray pattern have been specifically engineered for the optimum application of Bituthene System 4000 Surface Conditioner.

Hold nozzle 450 mm (18 in.) from substrate and squeeze handle to spray. Spray in a sweeping motion until substrate is uniformly covered.

Sprayer should be repressurized by pumping as needed. For best results, sprayer should be maintained at high pressure during spraying.

To release pressure, invert the sprayer and spray until all compressed air is released.

Maintenance

The Bituthene System 4000 Surface Conditioner Sprayer should perform without trouble for an extended period if maintained properly.

Sprayer should not be used to store Bituthene System 4000 Surface Conditioner. The sprayer should be flushed with clean water immediately after spraying. For breaks in the spray operation of one hour or less, invert the sprayer and squeeze the spray handle until only air comes from the nozzle. This will avoid clogging.

Should the sprayer need repairs or parts, call the maintenance telephone number on the sprayer tank (800-323-0620).

Supply

Bituthene System 4000	0.9 m x 20 m roll (18.6 m^2) 3 ft x 66.7 ft (200 ft^2)
Roll weight	38 kg (83 lbs) gross
Palletization	25 rolls per pallet
Storage	Store upright in dry conditions below +35°C (95°F).
System 4000 Surface Conditioner	1 x 2.3 L (0.625 gal) bottle in each roll of System 4000 Membrane
Ancillary Products	
Surface Conditioner Sprayer	7.6 L (2 gal) capacity professional grade sprayer with specially engineered nozzle
Bituthene Liquid Membrane	5.7 L (1.5 gal) pail/125 pails per pallet or 15.1 L (4 gal) pail/48 pails per pallet
Hydroduct Tape	2.5 cm x 61.0 m (1 in. x 200 ft) roll/6 rolls per carton
Bituthene Mastic	12 – 0.9 L (30 oz) tubes/carton or 18.9 L (5 gal) pail/36 pails per pallet
Complimentary Materials	
Hydroduct	See separate data sheets.
Protection Board Adhesive	18.9 L (5 gal) pail/36 pails per pallet

Equipment by Others: Soft broom, utility knife, brush or roller for priming

Physical Properties for Bituthene 4000 Membrane

Property	Typical Value	Test Method
Color	Dark gray-black	
Thickness	1.5 mm (1/16 in.) nominal	ASTM D3767 – Method A
Flexibility, 180° bend over 25 mm (1 in.) mandrel at -32°C (-25°F)	Unaffected	ASTM D1970
Tensile Strength, Membrane, Die C	2240 kPa (325 lbs/$in.^2$) minimum	ASTM D412 Modified[1]
Tensile Strength, Film	34.5 MPa (5,000 lbs/$in.^2$) minimum	ASTM D882 Modified[1]
Elongation, Ultimate Failure of Rubberized Asphalt	300% minimum	ASTM D412 Modified[1]
Crack Cycling at -32°C (-25°F), 100 Cycles	Unaffected	ASTM C836
Lap Adhesion at Minimum Application Temperature	880 N/m (5 lbs/in.)	ASTM D1876 Modified[2]
Peel Strength	1576 N/m (9 lbs/in.)	ASTM D903 Modified[3]
Puncture Resistance, Membrane	222 N (50 lbs) minimum	ASTM E154
Resistance to Hydrostatic Head	70 m (210 ft) of water	ASTM D5385
Permeance	2.9 ng/m^2sPa (0.05 perms) maximum	ASTM E96, Section 12 – Water Method
Water Absorption	0.1% maximum	ASTM D570

Footnotes:
1. The test is run at a rate of 50 mm (2 in.) per minute.
2. The test is conducted 15 minutes after the lap is formed and run at a rate of 50 mm (2 in.) per minute at 5°C (40°F).
3. The 180° peel strength is run at a rate of 300 mm (12 in.) per minute.

Physical Properties for System 4000 Surface Conditioner

Property	Typical Value
Solvent Type	Water
Flash Point	>60°C (>140°F)
VOC* Content	125 g/L
Application Temperature	-4°C (25°F) and above
Freeze Thaw Stability	5 cycles (minimum)
Freezing Point (as packaged)	-10°C (14°F)
Dry Time (hours)	1 hour**

* Volatile Organic Compound
** Dry time will vary with weather conditions

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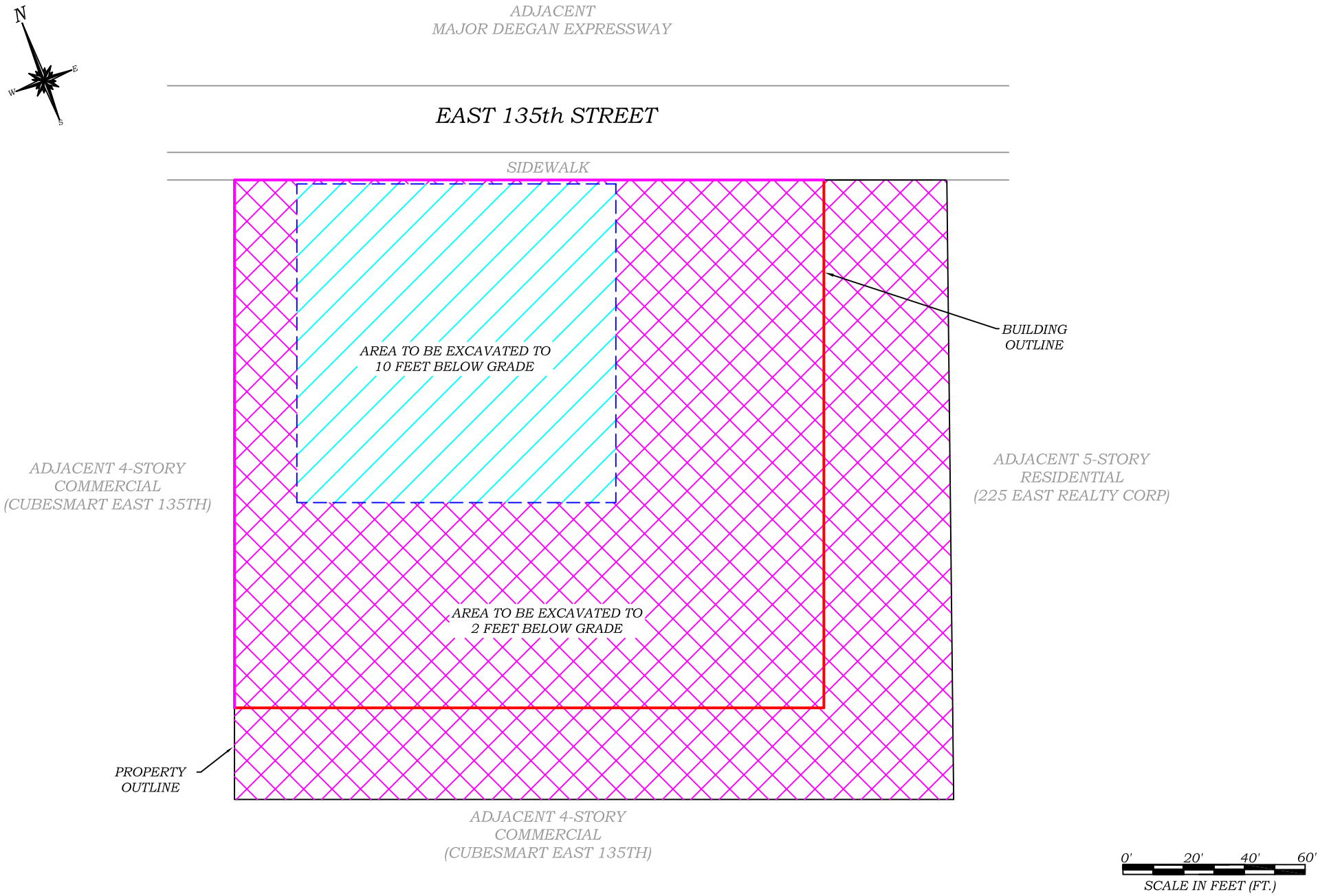
Appendix 10
Revised Proposed Excavation Plan



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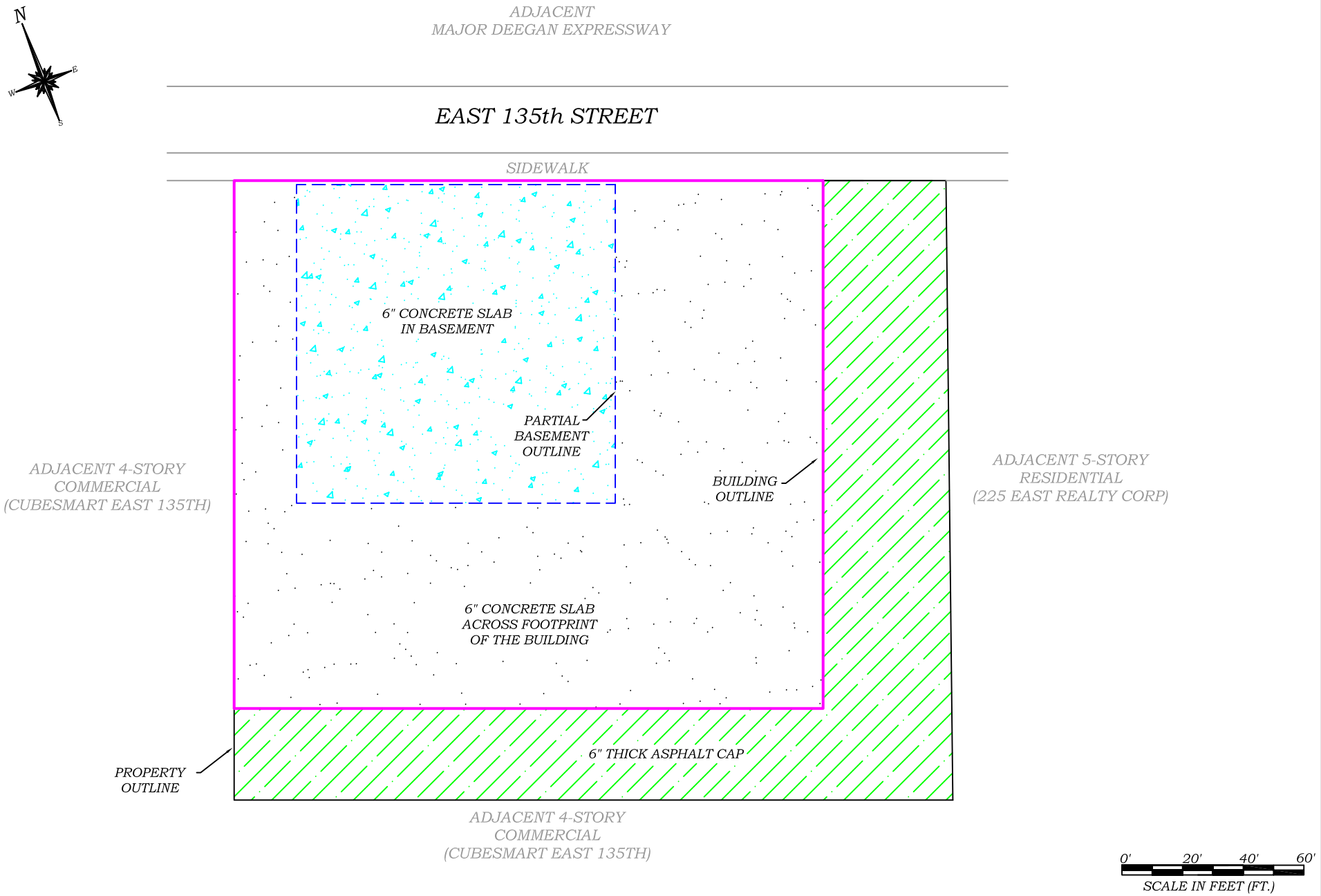
Drawn By:	C.Q.
Reviewed By:	M.V
Approved By:	M.R
Date:	09/20/15
Scale:	AS NOTED

TITLE:

APPENDIX 10: REVISED PROPOSED EXCAVATION PLAN

Appendix 11
Composite Cover Plan



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Drawn By: C.Q.
Reviewed By:
Approved By: M.R
Date: 09/17/15
Scale: AS NOTED

TITLE:

APPENDIX 11: COMPOSITE SITE COVER

Appendix 12
Proposed Development Plans

KFA - RESIDENTIAL DEVELOPMENT - EAST 135TH ST, BRONX Page 1 of 3 2015 JUL 29

KFA - RESIDENTIAL DEVELOPMENT - EAST 135TH ST, BRONX Page 3 of 3 2015 JUL 29

NEW MIXED USE DEVELOPMENT

200 EAST 135TH STREET, BRONX, NY

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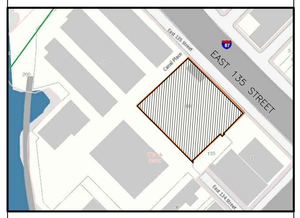
KEY PLAN



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drawing title
COVER SHEET

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drawn	drawing no. T-001.00
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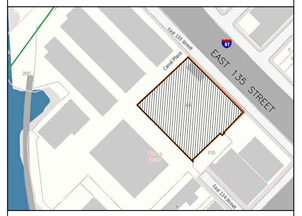
KEY PLAN



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drawn		drawing no.	T-002.00
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GENERAL NOTES:

1. DO NOT SCALE THE DRAWINGS. USE CALCULATED DIMENSIONS ONLY.

2. THE CONTRACTOR SHALL PROVIDE PROTECTION FOR THE GENERAL PUBLIC AND CONSTRUCTION WORKERS IN AND AROUND THE CONSTRUCTION AREA, AND FOR THE ADJACENT PROPERTY AND PERSONS. ADEQUATE BARRIERS SHALL BE PROVIDED TO EXERCISE CONTROL OF SAFE INGRESS AND EGRESS OF THE PREMISES. FIRE EXITS SHALL BE MAINTAINED AT ALL TIMES, AND AT NO TIME BE BLOCKED. THE CONTRACTOR SHALL BARRICADE ALL UNSAFE OR INJURIOUS CONDITIONS.

3. ALL EXISTING CONSTRUCTION AND EQUIPMENT SHALL BE PROTECTED BY THE CONTRACTOR DURING THE ENTIRE PERFORMANCE OF THE WORK. AREAS DISTURBED OR DAMAGED BY THE CONTRACTORS SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY CLEAN UP OF CONSTRUCTION DEBRIS. ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY DISPOSED OF, AWAY FROM THE PREMISES. NO ON-SITE STORAGE OR BURIAL OF DEBRIS SHALL BE ALLOWED.

5. NOT USED

6. THE CONTRACTOR SHALL CHECK AND VERIFY THE EXISTING CONDITIONS AT THE SITE AGAINST THE DRAWINGS AND SPECIFICATIONS, AND INFORM THE ARCHITECT OF ANY DISCREPANCIES PRIOR TO COMMENCEMENT OF WORK.

7. ALL DIMENSIONS INDICATED ON THESE DRAWINGS, OF EXISTING CONDITIONS, ARE APPROXIMATE AND SHALL BE FIELD VERIFIED TO THE CONTRACTOR'S SATISFACTION PRIOR TO COMMENCEMENT OF WORK.

8. NOT USED

9. WORK NOT INDICATED ON A PART OF THE DRAWINGS, BUT REASONABLY IMPLIED TO BE SIMILAR TO THAT SHOWN AT CORRESPONDING PLACES, SHALL BE PROVIDED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

10. MINOR DETAILS OR INCIDENTAL ITEMS NOT USUALLY SHOWN OR SPECIFIED, BUT NECESSARY FOR A PROPER AND COMPLETE INSTALLATION OF ANY PART OF THE WORK SHALL BE INCLUDED AS REQUIRED, AS IF THEY WERE INDICATED ON THE DRAWINGS.

11. ALL ITEMS LABELED 'EXISTING' ARE EXISTING TO REMAIN', UNLESS OTHERWISE INDICATED. ITEMS NOT LABELED 'EXISTING' ARE TO BE PROVIDED. THE TERM 'PROVIDE' SHALL MEAN PROVIDE AND INSTALL, AS IT IS USED THROUGHOUT THE NOTES ON THE DRAWINGS AND IN THE SPECIFICATIONS.

12. DETAILS AND SECTIONS ON THE DRAWINGS ARE SHOWN AT SPECIFIC LOCATIONS, AND ARE INTENDED TO SHOW GENERAL REQUIREMENTS THROUGHOUT. DETAILS NOTED AS "TYPICAL" IMPLY ALL CONDITIONS ARE TO BE TREATED SIMILARLY.

13. ALL TIME-RATED CONSTRUCTION SHALL MEET THE FIRE-RESISTIVE RATINGS AND OTHER REQUIREMENTS OF LOCAL LAWS, ORDINANCES, REGULATIONS AND AUTHORITIES HAVING JURISDICTION.

14. ALL PIPE SPACES AND DUCT SPACES SHALL BE ENCLOSED AND FIRE-STOPPED BY A PARTITION OF THE REQUIRED RATING.

15. NOT USED

16. PRIOR TO THE START OF THE WORK, THE CONTRACTOR SHALL COORDINATE THE SEQUENCE OF THE WORK AND SCHEDULE FOR ALL WORK WITH THE OWNER. CONTRACTOR SHALL MEET WITH WITH THE OWNER PRIOR TO THE START OF THE WORK TO DETERMINE ANY AND ALL ITEMS FOR SALVAGE.

17. NOT USED.

18. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE WITH THE OWNER, THE DISCONNECT OF ALL UTILITIES PRIOR TO COMMENCEMENT OF WORK.

19. ALL INFORMATION FOR ALL TRADES CONTAINED WITHIN THE CONTRACT DOCUMENTS SHALL BE USED, TOGETHER AND IN CONCERT WITH ONE ANOTHER, AS A WHOLE BODY OF INFORMATION FOR THE PROJECT. NO CONTRACTOR NOR SUBCONTRACTOR SHALL BE RELIEVED OF THE RESPONSIBILITY TO PROVIDE ALL ITEMS REQUIRED BY THE INFORMATION AND DESIGN INTENT INDICATED AND IMPLIED BY THE DOCUMENTS, REGARDLESS OF THE LOCATION OF THIS INFORMATION.

20. ALL ELECTRICAL OUTLETS, PLUMBING FIXTURES, MECHANICAL GRILLES, ETC. SHOWN ON THE ARCHITECTURAL DRAWINGS ARE INDICATED TO SET THE GENERAL LOCATION FOR EACH COMPONENT. CONTRACTOR SHALL REFER TO THE MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS FOR THE COMPLETE LAYOUT OF EACH RESPECTIVE ITEM.

21. THE CONTRACTOR SHALL SUBMIT REFLECTED CEILING COORDINATION PLANS FOR ALL SPACES. PLANS SHALL INDICATE CEILING GRID AND MATERIALS, DIFFUSERS, ELECTRICAL FIXTURES, SPRINKLERS, ETC. NO RELATED WORK SHALL PROCEED UNTIL SAID PLANS ARE APPROVED BY THE ARCHITECT.

22. NOT USED.

23. ALL NEW PIPING AND ELECTRICAL CONDUITS SHALL BE CONCEALED WITHIN NEW CONSTRUCTION UNLESS OTHERWISE NOTED.

24. THE CONTRACTOR SHALL FURNISH AND INSTALL ENCLOSURES NECESSARY TO FURR IN PIPES AND CHASES OR TO CONTINUE THE NORMAL LINE OF WALLS AND PARTITIONS.

25. PARTITIONS SHALL BE CONTINUOUS OVER ALL BUILT-IN EQUIPMENT WHERE SHOWN ON PLANS AND DETAILS. CONTRACTOR SHALL FURNISH ALL NECESSARY CONSTRUCTION TO SUPPORT THESE PARTITIONS.

26. THE GENERAL CONTRACTOR SHALL PATCH, REPAIR AND FINISH ALL CUTTING BY THE SUBCONTRACTORS.

27. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY SHORING AND BRACING TO SUPPORT EXISTING CONSTRUCTION UNTIL PERMANENT SUPPORT IS ERECTED. CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO PREVENT COLLAPSE OF WALLS, SLABS, ETC.

28. NOT USED.

29. ALL EXPOSED CONCRETE BLOCK WALLS TO BE RUNNING BOND, UNLESS OTHERWISE NOTED.

30. ALL INTERIOR SURFACES (NEW OR EXISTING) SHALL BE FIELD PAINTED, EXCEPT COLOR COORDINATED FACTORY FINISHES, UNLESS OTHERWISE NOTED.

31. FIRE AREAS SHALL BE SEPARATED FROM EACH OTHER VERTICALLY AND HORIZONTALLY BY FIRE BARRIER ASSEMBLIES HAVING A FIRE RESISTANCE RATING AS PER NEW YORK CITY BUILDING CODE 'SECTION BC 706 FIRE BARRIERS' FOR OCCUPANCY GROUPS B (BUSINESS), M (MERCANTILE), AND U (UTILITY AND MISCELLANEOUS).

ABBREVIATIONS:

A.B.	ANCHOR BOLT
ABV.	ABOVE
A/C	AIR CONDITIONING
A.C.T.	ACOUSTICAL CEILING TILE
A.F.F.	ABOVE FINISHED FLOOR
ALT.	ALTERNATE
ALUM.	ALUMINUM
ARCH.	ARCHITECT
@	AT
BD.	BOARD
BIT.	BITUMINOUS
BLDG.	BUILDING
BLK.	BLOCK
BLKG.	BLOCKING
B.O.	BOTTOM OF
B.U.R.	BUILT-UP ROOFING
CAB.	CABINET
C.B.	CATCH BASIN
CEM.	CEMENT
C.J.	CONTROL JOINT
℄	CENTER LINE
CLG.	CEILING
CLOS.	CLOSET
C.M.U.	CONCRETE MASONRY UNIT
C.O.	CLEAN OUT
COL.	COLUMN
COL. DIM.	COLUMN DIMENSION
COMP. FL.	COMPOSITION FLOORING
CONC.	CONCRETE
CONT.	CONTINUOUS
CPT.	CARPET
CRS.	COURSE(S)
C.T.	CERAMIC TILE
DBL.	DOUBLE
DEPT.	DEPARTMENT
DET.	DETAIL
D.F.	DRINKING FOUNTAIN
DIM.	DIMENSION
DISP.	DISPENSER
DN.	DOWN
D.S.	DOWNSPOUT
DWG.	DRAWING
EA.	EACH
E.F.	EXHAUST FAN
E.I.F.S.	EXTERIOR INSULATION FINISHING SYSTEM
EL.	ELEVATION
ELEC.	ELECTRIC
ELEV.	ELEVATOR
EQUIP.	EQUIPMENT
E.W.C.	ELECTRIC WATER COOLER
EXIST.	EXISTING
EXP. JT.	EXPANSION JOINT
F.B.C.	FIRE BLANKET CABINET
F.D.	FLOOR DRAIN
FDN.	FOUNDATION
F.E.C.	FIRE EXTINGUISHER CABINET
F.H.C.	FIRE HOSE CABINET
FIN.	FINISH
FIXT.	FIXTURE
FL.	FLOOR
FOOT'G.	FOOTING
GA.	GAUGE
GALV.	GALVANIZED
G.C.	GENERAL CONTRACTOR
GEO.	GEODETIC
GL.	GLASS
GYP. BD.	GYPSUM BOARD
H.	HEIGHT
HDCP	HANDICAPPED
HMTL.	HOLLOW METAL
HORIZ.	HORIZONTAL
H.P.	HIGH POINT
HR.	HOUR
H.R.	HANDRAIL
HTR.	HEATER
H.W.	HOT WATER
INDIV.	INDIVIDUAL
INSTR.	INSTRUMENT
INSUL./INS.	INSULATION
JAN.	JANITOR
JST.	JOIST
JT.	JOINT
LAM.	LAMINATE
LAV.	LAVATORY
LDR.	LEADER
L.P.	LOW POINT
MACH.	MACHINE
MAX.	MAXIMUM
MECH.	MECHANICAL
MFR.	MANUFACTURER
MIN.	MINIMUM
MIR.	MIRROR
M.O.	MASONRY OPENING
MOD.	MODIFIED
MTL.	METAL
N.I.C.	NOT IN CONTRACT
NO.	NUMBER
NOM.	NOMINAL
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
O.H.	OVERHEAD
OHG.	OVERHANG
PART.	PARTITION
P.C.	PRECAST
P.I.P.	POURED IN PLACE
PL.	PROPERTY LINE
P. LAM	PLASTIC LAMINATE
PLTFM.	PLATFORM
PLYWD.	PLYWOOD
PMF.	PREMOLDED FILLER
R.D.	ROOF DRAIN
REC.	RECEPTACLE
REINF.	REINFORCEMENT
REQ.	REQUIRED
RM.	ROOM
R.W.L.	RAIN WATER LEADER
S.A.P.	SPRAY-APPLIED ACOUSTICAL PLASTER
S.A.T.	SUSP. ACOUSTICAL TILE
SECT.	SECTION
SIM.	SIMILAR
SPEC.	SPECIFICATION
STD.	STANDARD
STL.	STEEL
STOR.	STORAGE
STRUCT.	STRUCTURAL
TB.	TACK BOARD
TEMP.	TEMPERATURE
TEMP'D.	TEMPERED
T.O.	TOP OF
TOIL.	TOILET
T.O.M.	TOP OF MASONRY
T.O.S.	TOP OF STEEL
TYP.	TYPICAL
U/S	UNDERSIDE
U.V.	UNIT VENTILATOR
VCT	VINYL COMPOSITION TILE
VERT.	VERTICAL
VEST.	VESTIBULE
W/	WITH
W.C.	WATER CLOSETS
WD.	WOOD
WG.	WIRE GLASS
W.W.F.	WELDED WIRE FABRIC

MATERIALS LEGEND:

	EARTH-UNTOUCHED		CONTINUOUS BLOCKING
	EARTH-BACKFILL		INTERMITTENT BLOCKING
	CONCRETE		COMPRESSIBLE FILLER
	GRAVEL		INSULATION-RIGID
	BRICK/FACE BRICK		INSULATION-BATT/BLANKET
	CONCRETE MASONRY UNIT		ACOUSTIC TILE
	GYPSUM BOARD		GLASS
	PLYWOOD		FIBERBOARD
	WOOD-FINISHED		STEEL
	CARPET		ALUMINUM
	CERAMIC TILE		PLASTIC LAMINATE

NOTES:

1. ALL BATHROOMS, KITCHENS & KITCHENETTES WITHIN ALL DWELLING UNITS SHALL BE HANDICAPPED ADAPTABLE.
2. ALL TOILETS & PANTRIES IN COMMERCIAL & RECREATION SPACES TO BE HANDICAPPED ACCESSIBLE.
3. MINIMUM SIZE ADAPTABLE KITCHEN OR KITCHENETTE AS PER NYC B.C. CHAPTER 11, SECTION 1107.
4. MINIMUM SIZE ADAPTABLE BATHROOM AS PER NYC B.C. CHAPTER 11, SECTION 1107.
5. ALL HANDICAPPED ACCESSIBLE DOORS SHOWN ON PLANS TO HAVE A MINIMUM OF 32" (2'-10" WIDTH) CLEARANCE & TO HAVE HARDWARE AND SADDLES COMPLYING WITH (ANSI A117.1), (SEE HANDICAPPED DETAILS & NOTES).
6. ALL NON FIRE RATED DOORS TO BE SOLID CORE.
7. ALL FIREPROOF SELF-CLOSING DOORS "FPSC" TO BE 1½Hr. OR ¾Hr. FIRE RATED AS PER TABLE 715.3, SEE DOOR SCHEDULE.
8. ENCLOSURE OF VERTICAL EXITS, EXIT PASSAGEWAYS, HOISTWAYS AND SHAFTS TO BE 2Hr. FIRE RATED AS PER 2008 NYC BUILDING CODE.
9. FLOOR CONSTRUCTION INCLUDING BEAMS TO BE 1½Hr. FIRE RATED AS PER 2008 NYC BUILDING CODE.
10. COLUMNS AND GIRDERS TO BE 2Hr. FIRE RATED AS PER 2008 NYC BUILDING CODE.
11. ALL BATHROOMS TO BE MECHANICALLY VENTED BY AN EXHAUST SYSTEM HAVING A MINIMUM OF 50cfm.
12. ALL BATHROOM DOORS TO BE ½" UNDERCUT FOR AIR INGRESS.
13. ALL KITCHENETTE FLOOR AREAS TO BE 79 Sq. Ft. MAXIMUM.
14. ALL KITCHENETTES TO BE MECHANICALLY VENTED BY AN EXHAUST SYSTEM HAVING A MINIMUM OF 120cfm.

DOB APPLICATIONS FILING NOTES:

1. ARCHITECTURAL WORK FILED UNDER NB APPLICATION # 321042231
2. STRUCTURAL WORK FILED UNDER SEPARATE APPLICATION.
3. SUPPORT OF EXCAVATION FILED UNDER SEPARATE APPLICATION.
4. PLUMBING & MECHANICAL SYSTEMS FILED UNDER SEPARATE APPLICATION.
5. SPRINKLER & STANDPIPE FILED UNDER SEPARATE APPLICATION.
6. FIRE ALARM SYSTEM FILED UNDER SEPARATE APPLICATION.
7. BOILER FILED UNDER SEPARATE APPLICATION.
8. BUILDERS PAVEMENT PLAN (BPP) FILED UNDER APPLICATION# 321104933
9. FIRE PROTECTION PLAN (FPP) FILED UNDER SEPARATE APPLICATION.

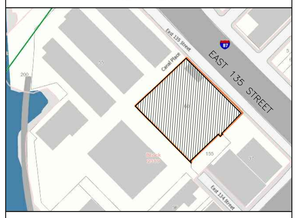
SPECIAL INSPECTIONS (TR-1):

• MASONRY	BC 1704.5	
• CURTAIN WALLS, AND VENEERS		BC 1704.10
• FIRESTOP, DRAFTSTOP AND FIREBLOCK SYSTEMS 1704.25		BC
• FRAME INSPECTION	BC109.3.3	
• ENERGY CODE COMPLIANCE INSPECTIONS	TR8	BC 109.3.5
• FIRE-RESISTANCE RATED CONSTRUCTION		BC 109.3.4

SPECIAL INSPECTIONS (TR-8):

• PROTECTION OF FOUNDATION		IA1, IIA1
• INSULATION PLACEMENT AND R VALUES		IA2, IIA2
• FENESTRATION THERMAL VALUES AND RATINGS		IA3, IIA3
• FENESTRATION RATINGS FOR AIR LEAKAGE		IA4, IIA4
• FENESTRATION AREAS	IA5, IIA5	
• AIR SEALING AND INSULATION - VISUAL		IA6, IIA6
• PROJECTION FACTORS	IIA7	

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

ISSUES/REVISIONS

MEP ENGINEER:
TSF ENGINEERING, P.C.
200 PARK AVENUE SOUTH, SUITE 916
NEW YORK, NY 10003.
(212) 253 7303 (TEL) - (212) 253 6512 (FAX)

SRTRUCTURAL ENGINEER:
WEXLER & ASSOCIATES
12 WEST 32ND STREET, 8TH FLOOR NEW YORK, NY 10001
TEL: (212) 643 1500
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INTERIOR DESIGNER:
DURUKAN DESIGN
16 WEST 37TH STREET, 3RD FLOOR NEW YORK, NY 10018
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CLIENT:
CHESS BUILDERS, LLC
TEL: (718) 522 5512

KARL FISCHER ARCHITECT
OAQ RAIC AIA
530 BROADWAY, 9th FLOOR, NEW YORK, NY 10012
TEL: (212) 219-9733 FAX: (212) 219-8980
1420 NOTRE-DAME WEST, MONTREAL, QC H3C 1K9
TEL: (514) 933-4137 FAX: (514) 933-0409
WEB SITE: WWW.KFARCHITECT.COM
E-MAIL:KARL@KFARCHITECT.COM

SEAL

REGISTERED ARCHITECT KARL FISCHER 087282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
GENERAL NOTES, CODE ANALYSIS, LEGEND

dob no

scale: NTS	project no.: 15-23
date:	sheet no.: 3 OF
drawn:	drawing no.: T-003.00
checked: KF	

W:\2015\15-23 200 East 135th\15-23 T-001-003.dwg, 04/08/2015 1:54:16 PM, Hamishw, DWG To PDF.pc3

AREA CHART - 200 EAST 135TH STREET - 2015/08/03

Floor	Total Gross Floor Area	Percentage of floor below	Commercial Floor Area	Parking Floor Area	Deductions: STAIR GREATER THAN 3'9" (8'X2'3)X2	Deductions: Compactor room	Deductions: Mechanical	Deductions: Mech. Room	Deductions: Q.H. Density in corridor	Deductions: Recreation Room	Deductions: Bicycle Parking	Total Deductions	Commercial Net for FAR	Residential Net for FAR	TOTAL Net for FAR
Cellar	10,248.00											10,248.00		0.00	0.00
1st	14,243.00		5,911.00		30.67	508.00	34.20	597.00		892.00	2,572.00	4,633.87	5,911.00	3,698.13	9,609.13
2	31,790.00			31,790.00								31,790.00		0.00	0.00
3	17,702.00				30.67	12.00	263.00			3,376.00		3,681.67		14,020.33	14,020.33
4	17,702.00				30.67	12.00	315.00					357.67		17,344.33	17,344.33
5	17,702.00				30.67	12.00	315.00					357.67		17,344.33	17,344.33
6	17,702.00				30.67	12.00	315.00					357.67		17,344.33	17,344.33
7	17,702.00				30.67	12.00	315.00					357.67		17,344.33	17,344.33
8	17,702.00				30.67	12.00	315.00					357.67		17,344.33	17,344.33
9	17,702.00				30.67	12.00	315.00					357.67		17,344.33	17,344.33
10	17,702.00				30.67	12.00	315.00					357.67		17,344.33	17,344.33
11	17,702.00				30.67	12.00	234.00					276.67		17,425.33	17,425.33
12	15,915.00				30.67	12.00	315.00					357.67		15,557.33	15,557.33
13	15,760.00				30.67	12.00	315.00					357.67		15,402.33	15,402.33
14	15,760.00				30.67	12.00	234.00					276.67		15,483.33	15,483.33
15	15,760.00				30.67	12.00	287.00					329.67		15,430.33	15,430.33
16	15,760.00				30.67	12.00	287.00					329.67		15,430.33	15,430.33
17	15,760.00				30.67	12.00	234.00					276.67		15,483.33	15,483.33
18	15,760.00				30.67	12.00	287.00					329.67		15,430.33	15,430.33
19	15,760.00				30.67	12.00	287.00					329.67		15,430.33	15,430.33
20	15,760.00				30.67	12.00	234.00					276.67		15,483.33	15,483.33
21	16,010.00				30.67	12.00	287.00					329.67		15,680.33	15,680.33
22	12,807.00	79.99%			30.67	12.00	233.00					276.67		12,531.33	12,531.33
23	10,192.00	79.58%			30.67	12.00	219.40					262.07		9,929.93	9,929.93
24	8,152.00	79.98%			30.67	12.00	115.00	340.00				497.67		7,654.33	7,654.33
25	6,459.00	79.23%			30.67	12.00	58.00	251.00	1,165.00			1,516.67		4,942.33	4,942.33
Roof	907.00				30.67			668.00				698.67		208.33	208.33
Total Gross Area Above Grade	**401,873.00**		**5,911.00**	**31,790.00**	766.75	784.00	6,128.60	1,265.00	591.00	5,433.00	2,572.00	**49,330.35**	**5,911.00**	**346,631.65**	**352,542.65**
Total Gross Area Incl. Cellar	**412,121.00**		**5,911.00**	**31,790.00**	766.75	784.00	6,128.60	1,265.00	591.00	5,433.00	2,572.00	59,578.35	5,911.00	346,631.65	352,542.65

Efficiency = Sellable Area/ Gross F.A.	Residential Sellable Area	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Units
	0.00																									0
0%	0.00																									0
0%	0.00																									0
67%	11,894.00	855	575	575	575	572	575	575	575	781	781	576	577	518	596				696	562	583	575	851	563		19
83%	14,776.00	855	575	575	575	572	575	575	575	781	781	576	577	518	739	544	796	796	544	740	538	583	575	851	563	24
83%	14,776.00	855	575	575	575	572	575	575	575	781	781	576	577	518	739	544	796	796	544	740	538	583	575	851	563	24
83%	14,776.00	855	575	575	575	572	575	575	575	781	781	576	577	518	739	544	796	796	544	740	538	583	575	851	563	24
83%	14,776.00	855	575	575	575	572	575	575	575	781	781	576	577	518	739	544	796	796	544	740	538	583	575	851	563	24
83%	14,776.00	855	575	575	575	572	575	575	575	781	781	576	577	518	739	544	796	796	544	740	538	583	575	851	563	24
83%	14,776.00	855	575	575	575	572	575	575	575	781	781	576	577	518	739	544	796	796	544	740	538	583	575	851	563	24
83%	14,776.00	855	575	575	575	572	575	575	575	781	781	576	577	518	739	544	796	796	544	740	538	583	575	851	563	24
83%	14,776.00	855	575	575	575	572	575	575	575	781	781	576	577	518	739	544	796	796	544	740	538	583	575	851	563	24
83%	14,776.00	855	575	575	575	572	575	575	575	781	781	576	577	518	739	544	796	796	544	740	538	583	575	851	563	24
83%	14,776.00	855	575	575	575	572	575	575	575	781	781	576	577	518	739	544	796	796	544	740	538	583	575	851	563	24
86%	13,683.00	855	575	575	575	572	575	575	575	781	781	576	577	518	739	797	797		733	538	583	575	851			21
86%	13,522.00	855	575	575	575	572	575	575	575	781	781	576	577	518	732	720	720		733	538	583	575	851			21
86%	13,522.00	855	575	575	575	572	575	575	575	781	781	576	577	518	732	720	720		733	538	583	575	851			21
86%	13,522.00	855	575	575	575	572	575	575	575	781	781	576	577	518	732	720	720		733	538	583	575	851			21
86%	13,522.00	855	575	575	575	572	575	575	575	781	781	576	577	518	732	720	720		733	538	583	575	851			21
86%	13,522.00	855	575	575	575	572	575	575	575	781	781	576	577	518	732	720	720		733	538	583	575	851			21
86%	13,522.00	855	575	575	575	572	575	575	575	781	781	576	577	518	732	720	720		733	538	583	575	851			21
86%	13,522.00	855	575	575	575	572	575	575	575	781	781	576	577	518	732	720	720		733	538	583	575	851			21
86%	13,772.00	855	575	575	575	572	575	575	575	781	781	576	577	518	732	845	845		733	538	583	575	851			21
84%	10,743.00		710	575	575	572	575	575	736			569	577	518	732	616	616		733	538	583	569				17
92%	8,361.00			736	575	572	575	736				600	518	732	720	720			733	538	606					13
83%	6,734.00				869	572	869						742	737	720	720			733	772						9
56%	3,636.00				875	572	875						657							657							5
72%	295,167.00																									465

TOTAL AREA LOT 48,976.00 S.F.

MAXIMUM PERMITTED RESIDENTIAL FAR WITHIN 100 FT OF A WIDE ST. 7.20 FAR

TOTAL MAXIMUM PERMITTED RESIDENTIAL ZONING FLOOR ARE FOR ENTIRE SITE 352,627 SF

PROPOSED GROSS RESIDENTIAL FLOOR AREA (INCLUDING PARKING) 401873.00 SF
PROPOSED RESIDENTIAL NET FLOOR AREA FOR FAR 346631.65 SF
PROPOSED RESIDENTIAL FAR 7.08

PROPOSED GROSS COMMERCIAL FLOOR AREA 5911.00 SF
PROPOSED COMMERCIAL NET FLOOR AREA FOR FAR 5911.00 SF
PROPOSED COMMERCIAL FAR 0.12

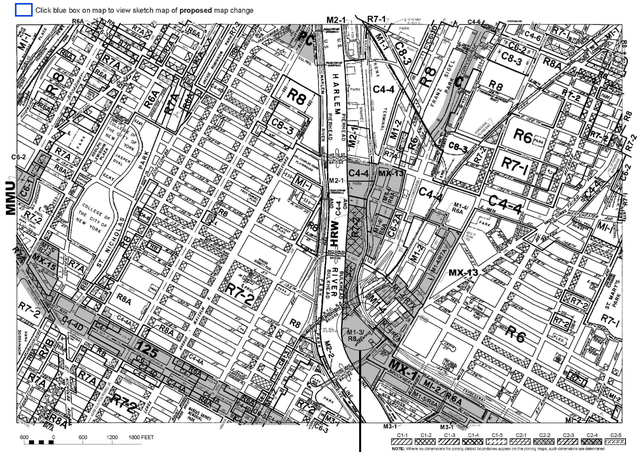
PROPOSED TOTAL GROSS FLOOR AREA INCLUDING CELLAR 412121.00 SF
PROPOSED TOTAL GROSS FLOOR AREA ABOVE GRADE 401873.00 SF
PROPOSED TOTAL ZONING FLOOR AREA 352542.65 SF
PROPOSED TOTAL FAR : 7.20
UNDER/(LT)/(-) 84.65 SF

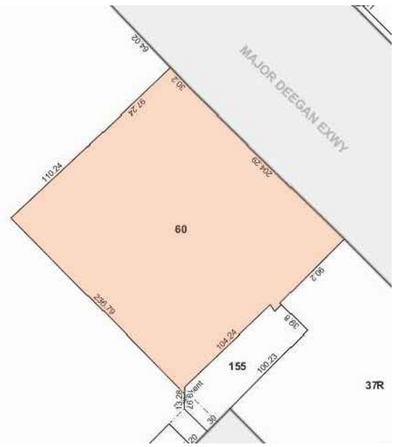
REQUIRED PARKING RESIDENTIAL		40%
TOTAL SPOTS REQUIRED	*40%	186
TOTAL SPOTS PROVIDED		206

UNITS

	1 BDRM + H.O.	38 UNITS	8%
	1 BDRM	293 UNITS	63%
	2 BDRMS	134 UNITS	29%
TOTAL		465 UNITS	100%

Click blue box on map to view sketch map of **proposed** map change





4 ZONING MAP
Z-001 SCALE: –

4 ZONING MAP
Z-001 SCALE: –

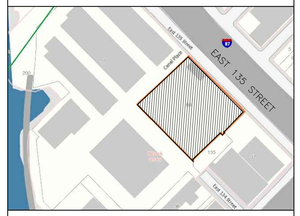
4 TAX MAP
Z-001 SCALE: –

ZONING ANALYSIS

ADDRESS:	200 EAST 135TH STREET, BRONX, NY, 10451
Block:	2319
Lot(s):	60
Zoning District(s):	M 1-3 / R-8 MX-1 SPECIAL DISTRICT
Zoning Map:	6A
Total Lot Area	48,976 SF
Inclusionary Housing	No
Flood Zone	Zone X
Environmental Designation	ZR 123-32: Environmental Conditions
Community District	Bronx 1

Applicable ZR Section	Item	Required/Permitted	Proposed	Compliance
Use Regulations				
123-20	Special Use Regulations	all uses permitted in the designated Residence district and all uses permitted in the M1 district		Complies
22-00	General Provisions, Uses Permitted	UG 1-4	UG 2 & UG 6	Complies
42-00	General Provisions, Uses Permitted	UG 4-14, 16,17	UG 2 & UG 6	Complies
Environmental Conditions				
123-20	Environmental Conditions	In Special Mixed Use Districts, all new dwelling units shall be provided with a minimum 35dB(A) of window wall attenuation to maintain an interior noise level of 45dB(A) or less, with windows closed, and shall provide an alternate means of ventilation.	Provided	Complies
Bulk Regulations - RESIDENTIAL BUILDING				
123-61	General Provisons	In Special Mixed Use Districts the bulk regulation set forth in Article II, chapter 3 shall apply to all residential uses in a building or other structure , and the bulk regulations set forth in article IV, Chapter 3, shall apply to all commercial and community facility uses, except as set forth in Sections 123-60 through 123-66		Complies
62-30 / 62-327	Maximum floor area ratio for a mixed use building in a Special Mixed Use District	The maximum floor area ratio for zoning lots containing a mixed use building in a Special Mixed Use District shall be in accordance with the provisions of Section 123-64 (Maximum Floor Area Ratio and Lot Coverage Requirements for Mixed Use Buildings).	see 123-64 below	
123-64 (a)(1)	Maximum Floor Area Ration and Lot Coverage Requirements for Zoning Lots Containg Mixed Use Buildings	FAR for Commercial uses shall be the applicable maximum floor area ratio permitted for manufacturing or commerical uses under the provisions of section 43-12, in accordance with the designated M1 district	see 43-12 below	
43-12	Maximum Commercial FAR	In M1-3 districts the FAR for commercail uses is 5.00	Proposed Commercial Floor Area Ratio: 0.12	complies
123-64 (a)(3)	Maximum Floor Area Ration and Lot Coverage Requirements for Zoning Lots Containgn Mixed Use Buildings	Where the Residence District designation is an R8 district, the maximum floor area ratio for residential uses shall be the applicable maximum FAR permitted under the provisions of section 123-63	see 123-63 below	
123-63	Maximum FAR for Zoning lots containing only Residential Buildings in R8 districts.	the maximum FAR for the applicable residence district in Section 23-145 shall apply	See 23-145 below	
23-145	Maximum Residential FAR	Maximum Floor area Ratio in R8 zone on a wide street = 7.20	Proposed Residential Floor Area Ratio: 7.09 (135th street is a wide street)	complies
123-64 (a)(4)	Maximum Floor Area Ration and Lot Coverage Requirements for Zoning Lots Containgn Mixed Use Buildings	The maximum total FAR in a mixed use building shall be the maximum floor area permitted for either the commercial or residential use as set forth in this section, whichever permits the greatest amount of floor area. Maximum total FAR = 7.20	Proposed total FAR = 7.20	complies
123-64 (b)	Lot Coverage Requirements for Zoning Lots Containgn Mixed Use Buildings	Lot coverage shall not apply.		
62-331 / 123-652	Special yard regulations for mixed use buildings	No Front yards or side yards are required in Special Mixed Use Districts. However, if any open area extending along a side lot line is provided at any level, such open area shall have a minimum width of eight feet. For a residential portion of a mixed use building, the required rear yard shall be provided at the floor level of the lowest story containing dwelling units.		
23-47	Minimum Required Rear Yards Residential	30'	30'	complies
123-66 / 123-662 (a)(1)	Height and Setback Regulations In Special Mixed Use districts with R8 designations	Max Base Height = 85'-0" Maximum Building Height = 210'-0" However a building may exceed such maximum building height by four stories or 40 feet, whichever is less, provided that the gross area of each story located above the maximum building height does not exceed 80 % of the gross area of the story below.	Proposed building height = 250'-0" each floor above 210 ft is less than 80% of the floor below	complies
23-22	Maximum Number of Dwelling Units	Permitted Zoning Floor Area/740 = (lot area) 48,976 sf x 7.2 far = 352,627 sf - 5,911 sf (commerical area) = 346,716/740 = 468 units	462	Complies
23-40	Yard Regulations			
23-44 (a)	Permitted Obstructions in Required Yards	Balconies		
23-132	Balconies in R8 district	Balconies may project up to 7ft into required rear yard.	Balconies project 5'-0" on 7th and 8th floor into rear yard setback.	complies
23-60	Height and Setback Regulations			
23-62	Permitted Obstructions	The following shall not be considered obstructions and may thus penetrate a maximum height limit or front or rear sky exposure planes: (c) Chimneys or flues, with a total width not exceeding 10% of the aggregate width of street walls of a building at any given level (e) Elevator or stair bulkheads, each having an aggregate width of street walls equal to not more than 30 feet. However, the product, in square feet, of the aggregate width of street walls of such obstructions facing each street frontage, times their average height, in feet, shall not exceed a figure equal to four times the width, in feet, of the street wall of the building facing such frontage. (f) Elevator shafts, portion of which provide as elevator stop with access to a roof, and associated vestibules providing access to such roof, provided that such vestibules include no more than 60 s.f. of floor area. (h) Parapet walls, not more than 4 ft. high.	Proposed stair and elevator bulkhead are complying.	Complies
Quality Housing requirements				
62-133 (b)	Applicability of the Quality Housing Program	In an R8 district any building containing residences on a zoning lot on a waterfront block shall comply with the applicable district bulk regulations as set forth in this Chapter. The bulk regulations in Article II, Chapter 3, applicable to Quality Housing developments shall not apply. However, all other requirements of the Quality		
28-12	Street Tree planting	1 tree/25' street frontage; 3' min caliper - 235/25 = 9.4 = 9	Tree's cannot be provided as sidewalk is only 5 ft wide	
28-21	Size of dwelling units	400 sf min	518 sf see Unit N floors 4-22	complies
28-22	Windows	all residential windows to be double-glazed	provided	complies
28-23	Refuse storage and disposal	2.9 cuft/ unit 2.9 x 460 units = 1334 cuf	4,064 cu.ft. Provided on ground floor	
28-24	Laundry Facilities	1 w.m./ 20 d.u. + 1 dryer/40 d.u. = 465 UNITS/20 = 24 req. W.m.12	49 W+D provided in basement and on each floor	complies
28-31	Req'd recreation space	3.3% of residential FA 346,631.35sf x 3.3 % = 11,439 sf	Indoor: 5,433sf (ground floor, 3rd floor and 25th floor) Outdoor: roof 10,000 sf	complies
28-32	Standards for rec. space			complies
26-33	Planting Areas	area between street and proposed building	area will be planted	complies
28-41	Density/corridor: exclude 50% FA	11 dwelling units max.	9 units on 24th floor, 5 units on 25th floor	complies
Accessory Off-Street Parking and Loading Regulations				
25-163	Maximum Spaces for residences	1 spot/225 sf of Lot area = 48976/225 = 217 max	205	Complies
25-20	Required Accessory Off-Street Parking Spaces For Residence			complies
123-72 / 25-23	Required residential parking	R8 = 40% of units = 465 * 40% = 186 parking spaces req.	186	complies
123-71 / 44-21	Required commercial parking	M1-3 Use group 6 general retail = 1 per 300 sf = 5911/300=19.7 = 20	20	complies
	Total parking required	206	206	complies
25-80	Bicycle Parking			
25-811	Enclosed Bicycle Parking Spaces	1 bicycle parking for each 2 dwelling units is required Required no. of spaces = 465 x 0.5 = 232.5 = 233 bicycle spaces	233 spaces provided (233x15 sf=3,495 sf) 3577 sf provided	Complies
44-60 / 36-70	Commerical Bicycle parking spaces	M1-3 Use group 6 general retail = 1 per 10,000 sf = 1 required	1 space provided	
25-83	Restrictions on Operations, Size and Location of Bicycle Parking spaces	All enclosed bicycle parking spaces shall be provided on the same zoning lot as the building. All enclosed bicycle parking's spaces shall be surrounded on all sides by solid enclosure, except where a parking garage is open at the sides, and covered by a roof for weather protection. Each bicycle space shall adjoin a rack or similar system for securing the bicycle. 15 s.f. of area shall be provided for each bicycle space. Required area =231 x 15 = 3465 s.f. A plaque shall be placed at the exterior of the entry to the bicycle parking area with lettering at least 3/4 in. in height stating 'Bicycle Parking'.	All Bicycle Parking spaces are enclosed with the signage as required. See CELLAR Plan (A-101)	Complies
44-52	Required Accessory Off-Street Loading Berths	M1-3 Use group 6 general retail = First 8000 sf = None required	5,911 sf < 8,000 sf = None provided	complies

KEY PLAN



issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

ISSUES/REVISIONS

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SEAL
REGISTERED ARCHITECT KARL FISCHER 031282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ZONING AND SITE ANALYSIS

dob no

scale 1/16"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. Z-001.00
checked KF	

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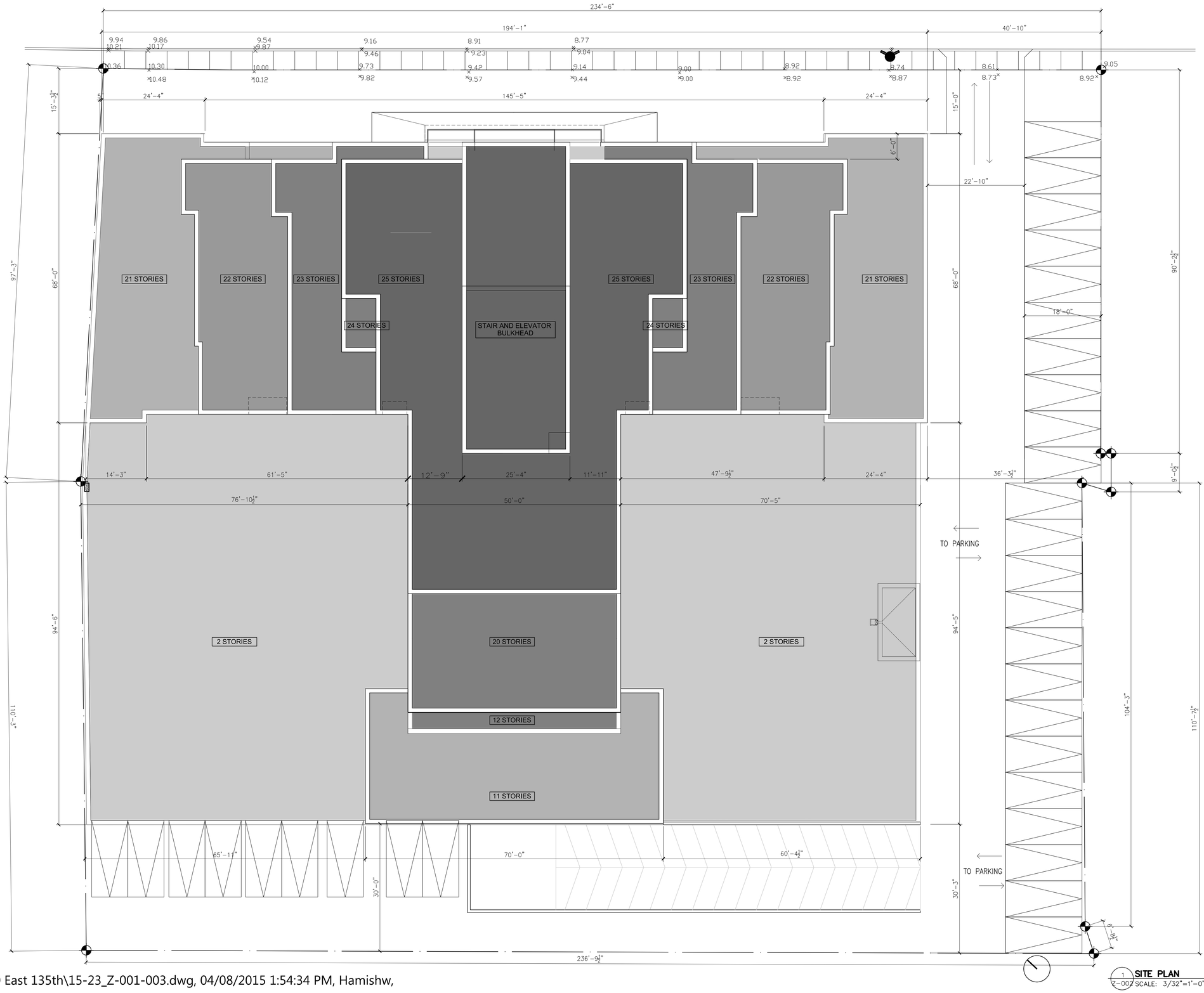
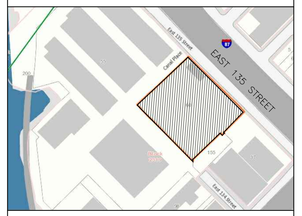


1 SITE PLAN
Z-002 SCALE: 3/32"=1'-0"

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		~~15/08/03~~	ISSUED TO D.O.B.
4		29/04/15	RE-ISSUED TO D.O.B.

ISSUES/REVISIONS

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SEAL
REGISTERED ARCHITECT KARL FISCHER 089282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
SITE PLAN

dob no

scale 3/32"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. Z-002.00
checked KF	

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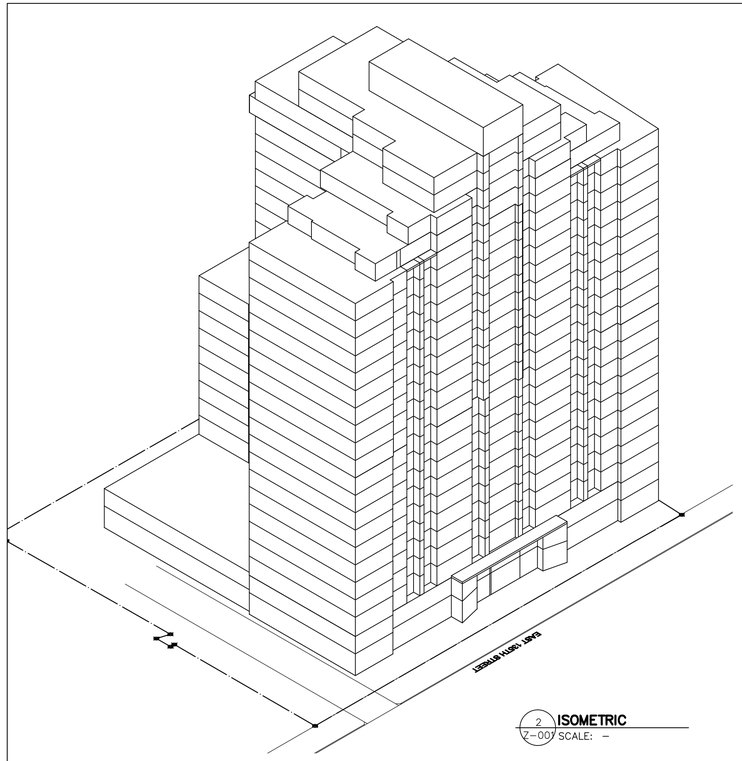
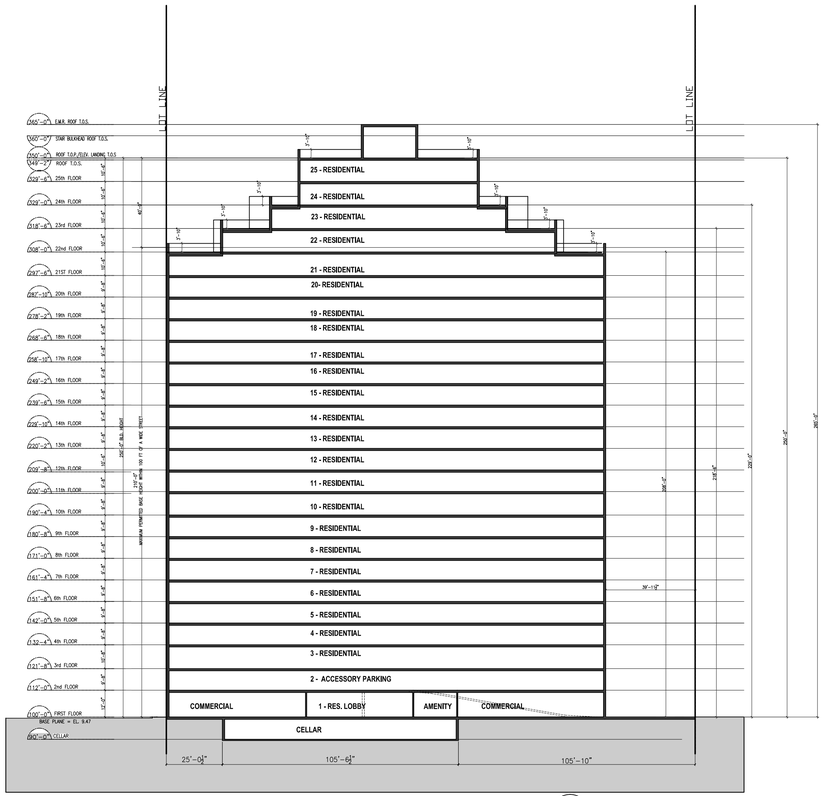
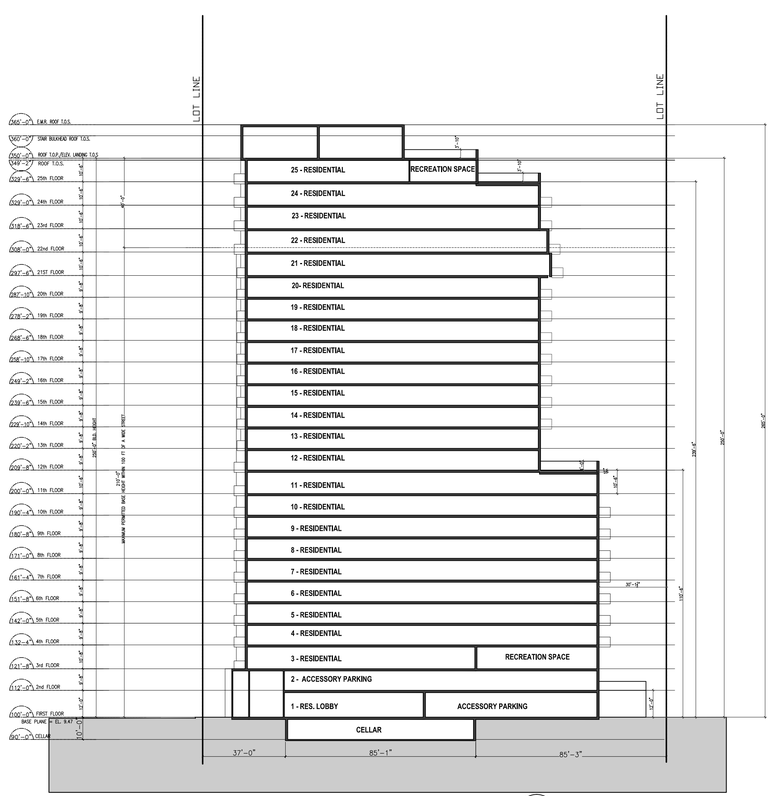


2 ISOMETRIC
Z-001 SCALE: –

1 KEY PLAN
Z-001 SCALE: 1/32"=1'-0"



3 SCHEMATIC SECTION
Z-003 SCALE: 1/32"=1'-0"



4 SCHEMATIC SECTION
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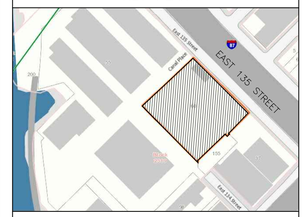

BLOCK: 2319 LOT: 60

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SEAL

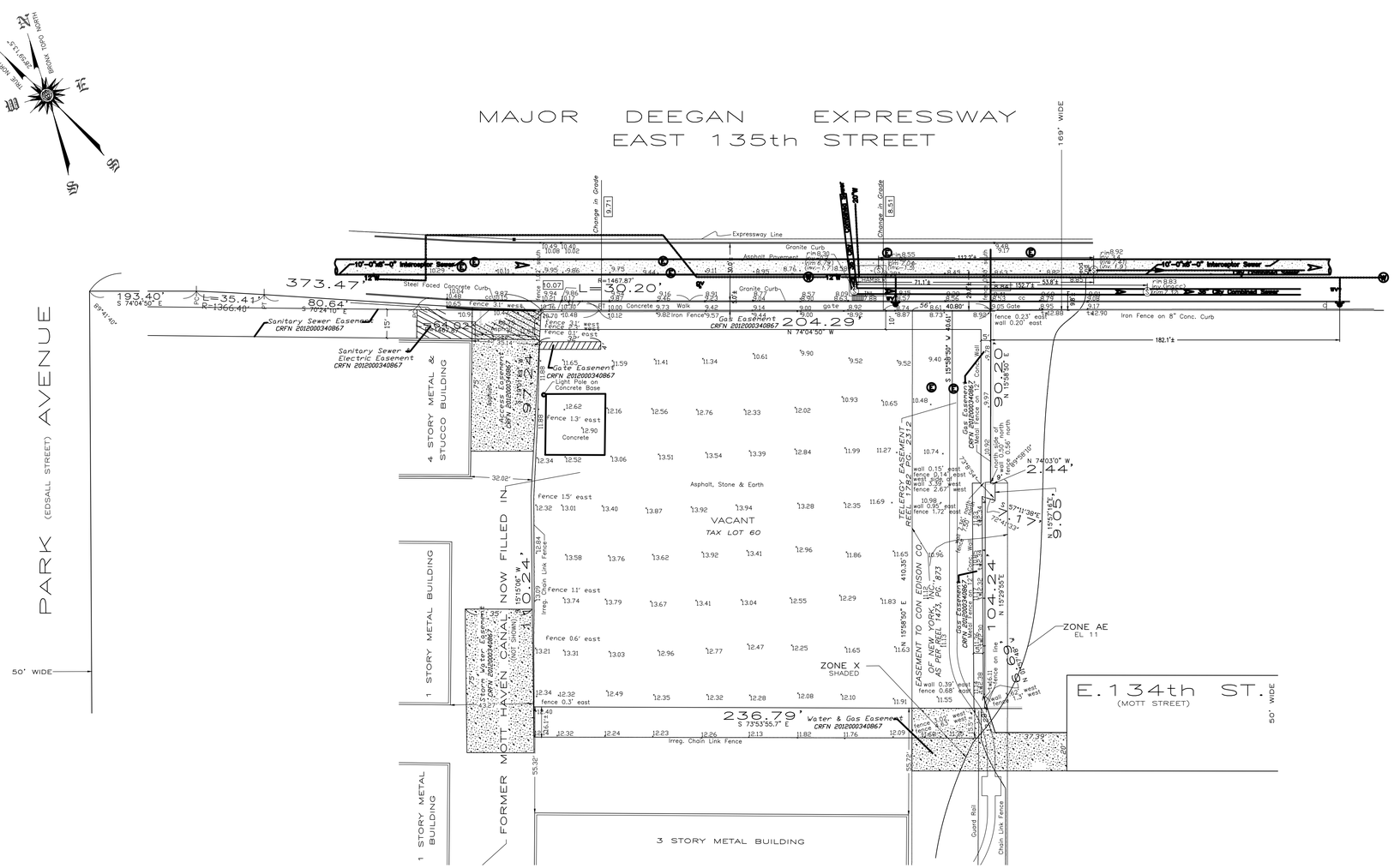
project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ZONING ANALYSIS

dob no

scale 1/16"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. Z-003.00
checked KF	

SURVEY No. 5778



GENERAL NOTES:

1. ELEVATIONS AND ESTABLISHED GRADES SHOWN HEREON REFER TO NAVD 1988 WHICH IS 1.508 FEET BELOW THE BRONX TOPOGRAPHICAL BUREAU DATUM.
2. ESTABLISHED GRADES SHOWN HEREON REFER TO TOP OF CURB. IF ESTABLISHED GRADES VARY SUBSTANTIALLY WITH EXISTING ELEVATIONS CONSULT WITH THE HIGHWAY DEPARTMENT BEFORE DESIGNING IMPROVEMENTS.
3. SIZES AND LOCATIONS OF WATER MAINS SHOWN HEREON AS SUPPLIED BY THE DEPARTMENT OF WATER SUPPLY, BOROUGH OF THE BRONX. LOCATIONS OF WATER SUPPLY MANHOLES, HYDRANTS AND WATER VALVES AS OBTAINED FROM FIELD MEASUREMENT.
4. SIZES AND TYPES OF SEWERS SHOWN HEREON AS OBTAINED FROM THE BOROUGH OF THE BRONX SEWER DEPARTMENT RECORDS. SEWER MANHOLE RIM AND INVERT ELEVATIONS SHOWN HEREON OBTAINED BY FIELD MEASUREMENTS UNLESS INDICATED (*) WHICH DENOTES INVERT INACCESSIBLE OR MANHOLE NOT FOUND IN FIELD. INFORMATION SHOWN IN THIS MANNER IS AS OBTAINED FROM THE BOROUGH OF THE BRONX SEWER DEPARTMENT RECORDS.
9. LOCATIONS OF ALL UTILITIES AND SUBSTRUCTURES ARE APPROXIMATE ONLY. THE INFORMATION GIVEN ON THE SURVEY PERTAINING TO UTILITIES AND SUBSTRUCTURES IS NOT CERTIFIED AS TO ACCURACY OR COMPLETENESS. CONSULT WITH THE APPROPRIATE COMPANY OR AGENCY BEFORE DESIGNING IMPROVEMENTS.
10. THE OWNER, CONTRACTOR AND/OR HIS AGENTS MUST NOTIFY THE APPROPRIATE UTILITY COMPANIES AND/OR AGENCIES AT LEAST 72 HOURS PRIOR TO ANY CONSTRUCTION IN ACCORDANCE WITH INDUSTRIAL CODE RULE 753.
11. NO EVIDENCE OF EXISTING STREAMS, CREEKS, DITCHES OR WATER COURSES ON/OR CROSSING PROPERTY SURVEYED.
12. NOT ALL SUBSURFACE INFORMATION PLOTTED.

LEGEND

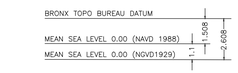
ASPH	ASPHALT
BK	BRICK
BSMT	BASEMENT
CC	CURB CUT
CCR	CONCRETE CURB ROUND
CD	CELLAR DOOR
CLF	CHAIN LINK FENCE
CO	CATCH BASIN CLEAN OUT
CONC	CONCRETE
CRF	CHAIN ROPE FENCE
CWA	CELLAR WINDOW AREA
DR	DRAIN
EL	ELEVATION
FAB	FIRE ALARM BOX
FC	FILL CAP
FL EL	FLOOR ELEVATION
GP	GUARD POLE
GV	GAS VALVE
IF	IRON FENCE
INL	CATCH BASIN INLET ELEVATION
INV	SEWER INVERT ELEVATION
Ⓛ	LIGHT POLE
MB	MAIL BOX
MHU	UNKNOWN MANHOLE
OF	OIL FILL
OHW	OVERHEAD WIRES
P	POLE
PAVT	PAVEMENT
PM	PARKING METER
PMULT	POLE, MULTIPLE USAGE
▲	SPRINKLER
△	STAND PIPE
PR	PEDESTRIAN RAMP
RET	RETAINING
RIM	RIM ELEVATION SEWER MANHOLE
SFCR	STEEL FACED CURB ROUND
STY	STORY
TB	TOP OF BANK ELEVATION
ϕ	TRAFFIC LIGHT
ɋ	TRAFFIC SIGN
TEL	TELEPHONE
TP	TREE PIT
TW	ELEVATION AT TOP OF WALL
UP	UTILITY POLE
VU	VALVE UNKNOWN
VLTU	VAULT UNKNOWN
VP	VENT PIPE
WV	WATER VALVE
12"G	GAS MAIN WITH SIZE
12"S	SEWER MAIN WITH SIZE
12"W	WATER MAIN WITH SIZE
▥	CATCH BASIN
Ⓔ E	ELECTRIC MANHOLE / VAULT
Ⓕ	FIRE MANHOLE
Ⓖ	GAS MANHOLE
Ⓢ	SEWER MANHOLE
Ⓣ	TELEPHONE MANHOLE
Ⓦ	WATER MANHOLE
TR	TRAFFIC VAULT
●	HYDRANT
T8	TREE WITH SIZE
17.0	ESTABLISHED/LEGAL GRADE
⇦	TRAFFIC FLOW
(rim 6.08) *(inv. –2.7)*	ELEVATIONS IN BOROUGH DATUM

FLOOD HAZARD NOTE

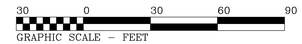
THE PARCEL SURVEYED IS COMPRISED OF AREAS DESIGNATED AS
ZONE X SHADED (BEETWEEN 0.2% AND 1% CHANCE OF FLOODING)
FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
COMMUNITY PANEL NUMBERS 360497 0091 F
EFFECTIVE DATE SEPTEMBER 5, 2007

PRELIMINARY FLOOD HAZARD NOTE

THE PARCEL SURVEYED IS COMPRISED OF AREAS DESIGNATED AS
ZONE X SHADED (BETWEEN 0.2% AND 1% CHANCE OF FLOODING)
ZONE AE (EL 11 NAVD 1988)
FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
COMMUNITY PANEL NUMBERS 360497 0091 G
PRELIMINARY JANUARY 30, 2013

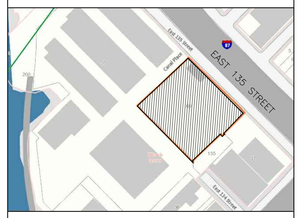


NAVD 1988 DATUM IS 1.508 FEET BELOW THE BRONX TOPO BUREAU DATUM



PARCEL AREA=48,976 SQ. FT.
OR 1.124343 ACRES

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
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project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
SURVEY

dob no

scale 1/16"=1'-0"	project no. 15–23
date 2014–04–02	sheet no. OF
drawn	drawing no. **Z-004.00**
checked KF	

REV	DATE	DESCRIPTION	ck
–	07–13–15	ARCHITECTURAL SURVEY	
A			

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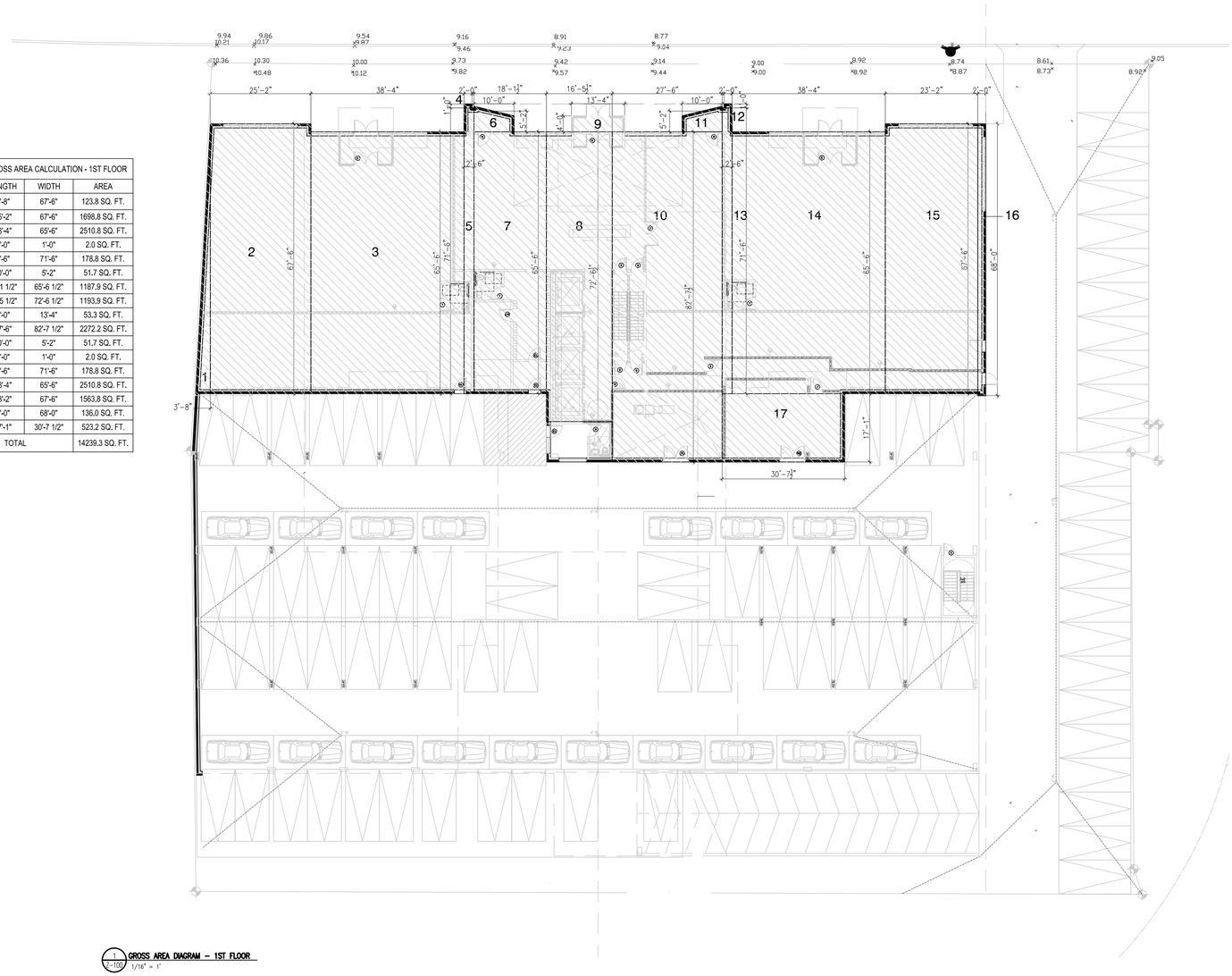
116 20 METROPOLITAN AVE * RICHMOND HILL NY 11418–1090 * (718) 849–0600

CITY OF N
COUNTY:
TAX BLOC
TAX LOT
SCALE

* SUCCESSOR TO:
POWELL C.E.,C.S.*L.C.L. SMITH C.S.*NATHAN CAMPBELL C.E.,C.S.*A.U. WHITSON C.E.,C.S.*
,L.S.,C.S.*A.U. WHITSON INC. C.E.,C.S.*G. WEBER L.S.,C.S.*C. STIDOLPH R.A.,L.S.*WHITSON &
KELLER & POWELL P.E.,L.S.,C.S.*LOUIS MONTROSE C.E.,L.S.,C.S.*FRED J. POWELL P.E.,L.S.,C.S.*

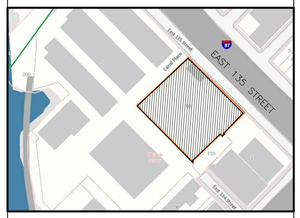
1 / Z-004 **SURVEY**
SCALE: 1/32"=1'-0"

	GROSS AREA CALCULATION - 1ST FLOOR		
TAG	LENGTH	WIDTH	AREA
1	3'-8"	67'-6"	123.8 SQ. FT.
2	25'-2"	67'-6"	1698.8 SQ. FT.
3	38'-4"	65'-6"	2510.8 SQ. FT.
4	2'-0"	1'-0"	2.0 SQ. FT.
5	2'-6"	71'-6"	178.8 SQ. FT.
6	10'-0"	5'-2"	51.7 SQ. FT.
7	18'-1 1/2"	65'-6 1/2"	1187.9 SQ. FT.
8	16'-5 1/2"	72'-6 1/2"	1193.9 SQ. FT.
9	4'-0"	13'-4"	53.3 SQ. FT.
10	27'-6"	82'-7 1/2"	2272.2 SQ. FT.
11	10'-0"	5'-2"	51.7 SQ. FT.
12	2'-0"	1'-0"	2.0 SQ. FT.
13	2'-6"	71'-6"	178.8 SQ. FT.
14	38'-4"	65'-6"	2510.8 SQ. FT.
15	23'-2"	67'-6"	1563.8 SQ. FT.
16	2'-0"	68'-0"	136.0 SQ. FT.
17	17'-1"	30'-7 1/2"	523.2 SQ. FT.
TOTAL			14239.3 SQ. FT.



1 / Z-100 GROSS AREA DIAGRAM - 1ST FLOOR
1/16" = 1'

KEY PLAN



BLOCK: 2319 LOT: 60

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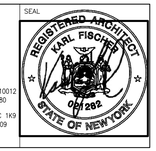

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ZONING ANALYSIS
FLOOR AREA DIAGRAMS

dob no

scale: AS INDICATED	project no.: 15-23
date: 2015-07-09	sheet no.: 10OF
drawn: VV	drawing no.: Z-100.00
checked: KF	

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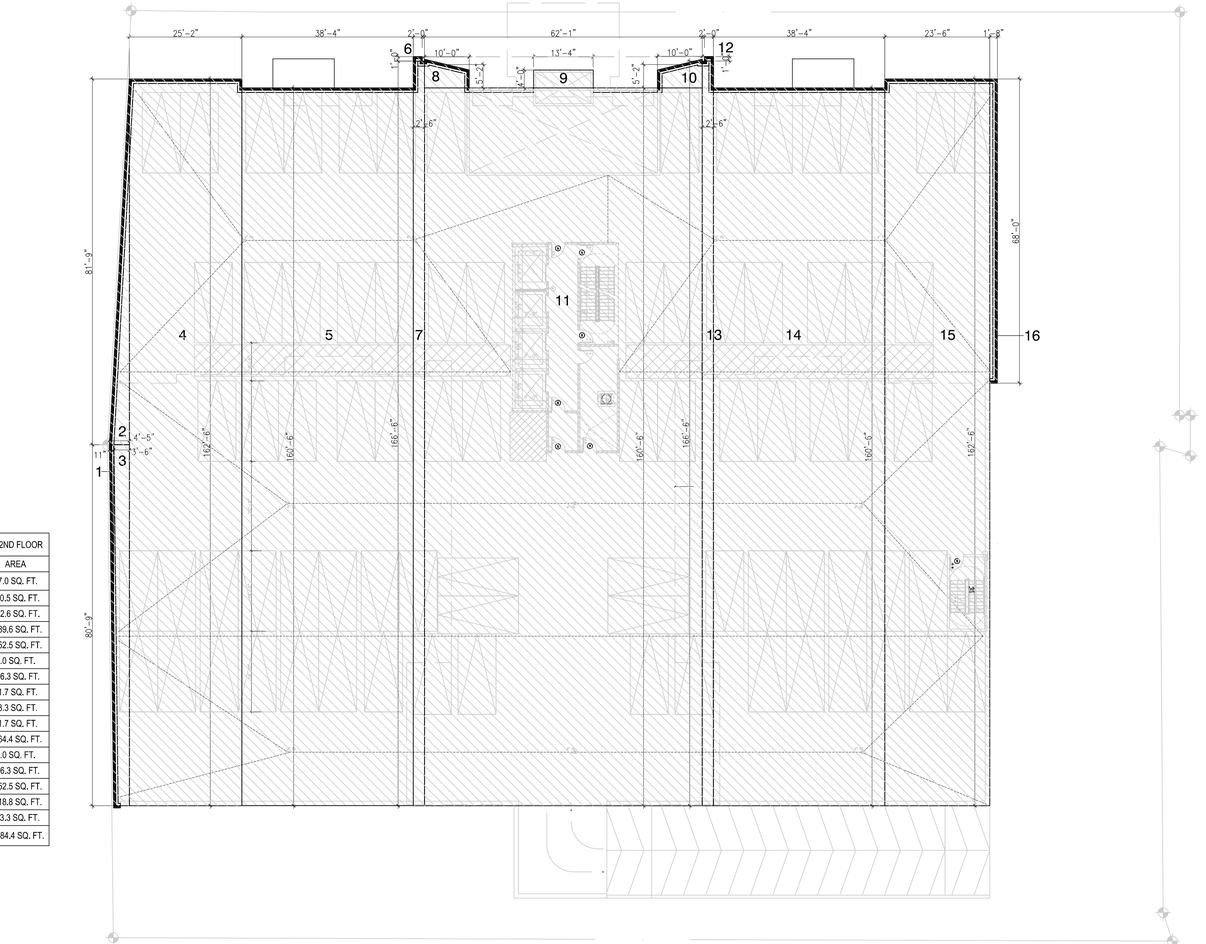

	GROSS AREA CALCULATION - 2ND FLOOR		
TAG	LENGTH	WIDTH	AREA
1	0'-11"	80'-9"	37.0 SQ. FT.
2	4'-5"	81'-9"	180.5 SQ. FT.
3	3'-6"	80'-9"	282.6 SQ. FT.
4	25'-2"	162'-6"	4089.6 SQ. FT.
5	38'-4"	160'-6"	6152.5 SQ. FT.
6	2'-0"	1'-0"	2.0 SQ. FT.
7	2'-6"	166'-6"	416.3 SQ. FT.
8	5'-2"	10'-0"	51.7 SQ. FT.
9	13'-4"	4'-0"	53.3 SQ. FT.
10	5'-2"	10'-0"	51.7 SQ. FT.
11	62'-1"	160'-6"	9964.4 SQ. FT.
12	2'-0"	1'-0"	2.0 SQ. FT.
13	2'-6"	166'-6"	416.3 SQ. FT.
14	38'-4"	160'-6"	6152.5 SQ. FT.
15	23'-6"	162'-6"	3818.8 SQ. FT.
16	1'-8"	68'-0"	113.3 SQ. FT.
TOTAL			31784.4 SQ. FT.

1 / Z-107 GROSS AREA DIAGRAM - 2ND FLOOR
1/16" = 1'

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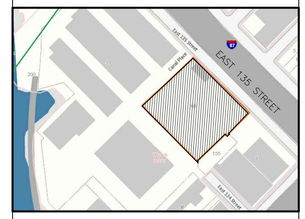
KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

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SEAL

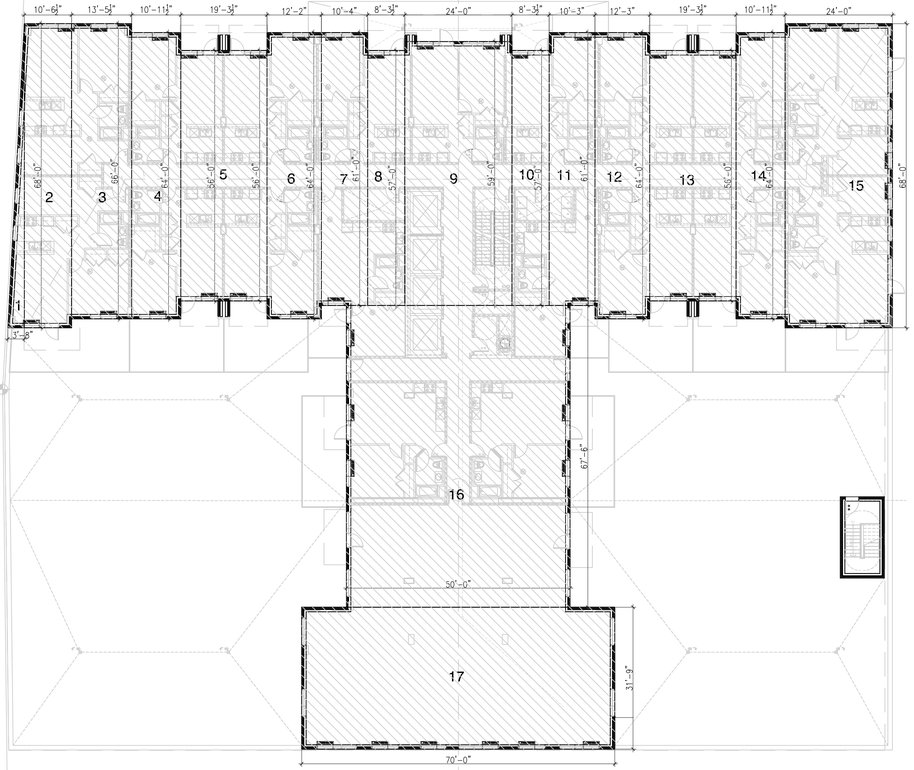
REGISTERED ARCHITECT KARL FISCHER 087282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ZONING ANALYSIS
FLOOR AREA DIAGRAMS

dob no

scale: AS INDICATED	project no.: 15-23
date: 2015-07-09	sheet no.: 10 OF
drawn: VV	drawing no.: Z-101.00
checked: KF	



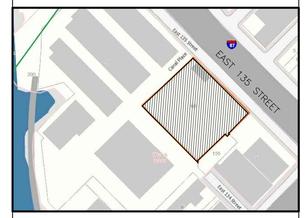
GROSS AREA DIAGRAM – 3RD FLOOR
1/16" = 1'

	GROSS AREA CALCULATION - 3RD FLOOR		
TAG	LENGTH	WIDTH	AREA
1	3'-8"	68'-0"	124.7 SQ. FT.
2	10'-6 1/2"	68'-0"	716.8 SQ. FT.
3	13'-5 1/2"	66'-0"	888.3 SQ. FT.
4	10'-11 1/2"	64'-0"	701.3 SQ. FT.
5	19'-3 1/2"	56'-0"	1080.3 SQ. FT.
6	12'-2"	64'-0"	778.7 SQ. FT.
7	10'-4"	61'-0"	630.3 SQ. FT.
8	8'-3 1/2"	57'-0"	472.6 SQ. FT.
9	24'-0"	59'-0"	1416.0 SQ. FT.
10	8'-3 1/2"	57'-0"	472.6 SQ. FT.
11	10'-3"	61'-0"	625.3 SQ. FT.
12	12'-3"	64'-0"	784.0 SQ. FT.
13	19'-3 1/2"	56'-0"	1080.3 SQ. FT.
14	10'-11 1/2"	64'-0"	701.3 SQ. FT.
15	24'-0"	68'-0"	1632.0 SQ. FT.
16	50'-0"	67'-6"	3375.0 SQ. FT.
17	70'-0"	31'-9"	2222.5 SQ. FT.
TOTAL			17702.1 SQ. FT.

	GROSS AREA CALCULATION - 4TH-11TH FLOORS		
TAG	LENGTH	WIDTH	AREA
1	3'-8"	68'-0"	124.7 SQ. FT.
2	10'-6 1/2"	68'-0"	716.8 SQ. FT.
3	13'-5 1/2"	66'-0"	888.3 SQ. FT.
4	10'-11 1/2"	64'-0"	701.3 SQ. FT.
5	19'-3 1/2"	56'-0"	1080.3 SQ. FT.
6	12'-2"	64'-0"	778.7 SQ. FT.
7	10'-4"	61'-0"	630.3 SQ. FT.
8	8'-3 1/2"	57'-0"	472.6 SQ. FT.
9	24'-0"	59'-0"	1416.0 SQ. FT.
10	8'-3 1/2"	57'-0"	472.6 SQ. FT.
11	10'-3"	61'-0"	625.3 SQ. FT.
12	12'-3"	64'-0"	784.0 SQ. FT.
13	19'-3 1/2"	56'-0"	1080.3 SQ. FT.
14	10'-11 1/2"	64'-0"	701.3 SQ. FT.
15	24'-0"	68'-0"	1632.0 SQ. FT.
16	50'-0"	67'-6"	3375.0 SQ. FT.
17	70'-0"	31'-9"	2222.5 SQ. FT.
TOTAL			17702.1 SQ. FT.

GROSS AREA DIAGRAM – 4TH-11TH FLOORS
1/16" = 1'

KEY PLAN



BLOCK: 2319 LOT: 60

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project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ZONING ANALYSIS
FLOOR AREA DIAGRAMS

dob no

scale: AS INDICATED	project no.: 15-23
date: 2015-07-09	sheet no.: 10 OF
drawn: VV	drawing no.: Z-102.00
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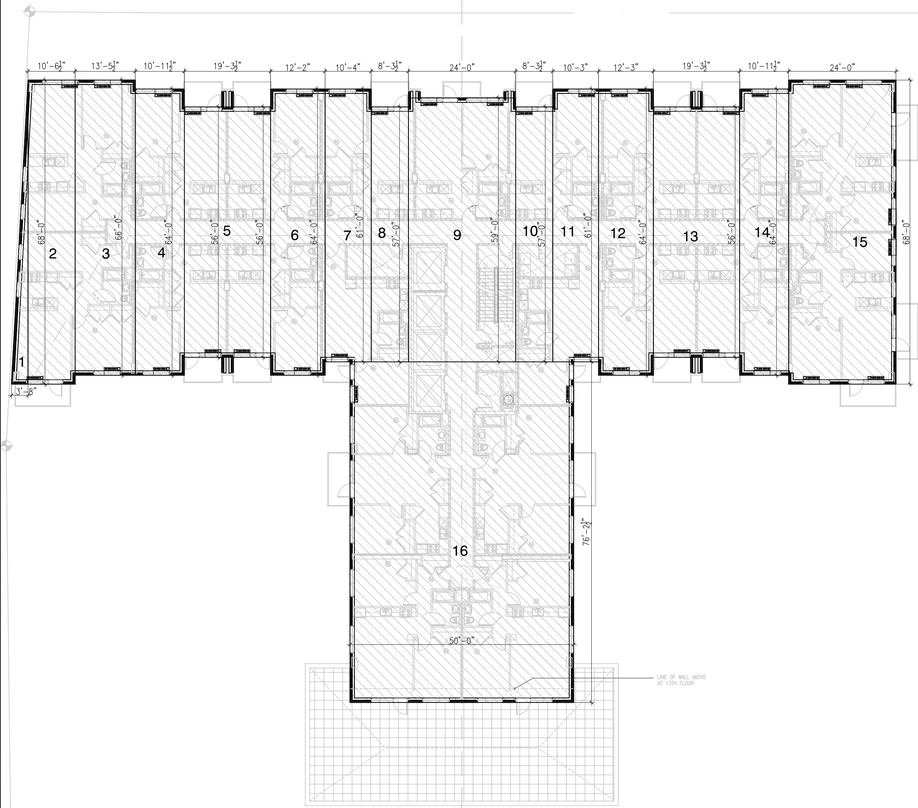
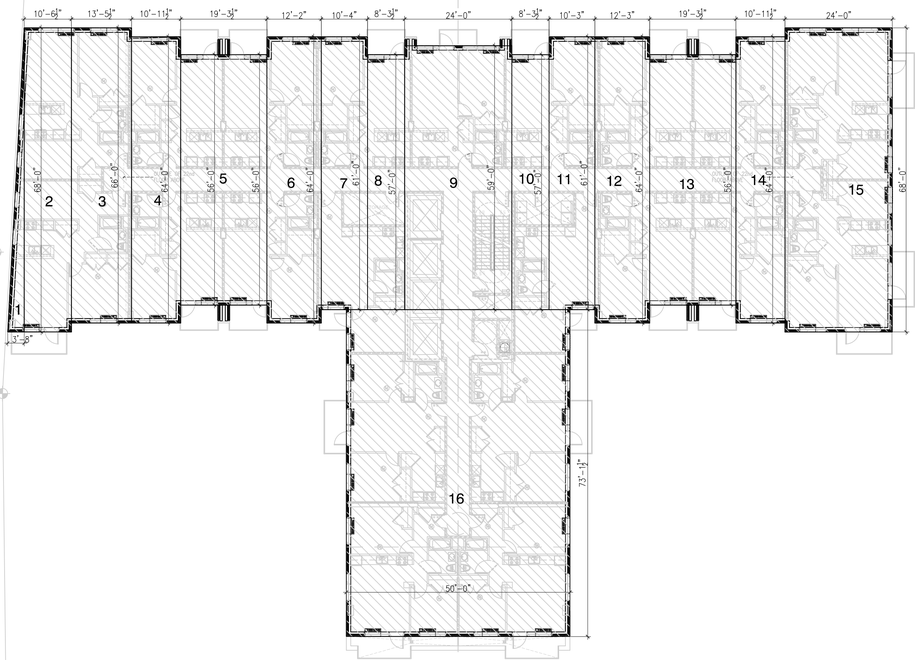


1 / Z-103 GROSS AREA DIAGRAM – 12TH FLOOR
1/16" = 1'

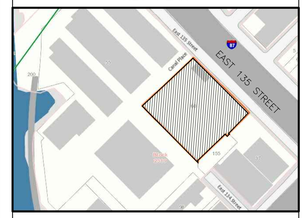
	GROSS AREA CALCULATION - 12TH FLOOR		
TAG	LENGTH	WIDTH	AREA
1	3'-8"	68'-0"	124.7 SQ. FT.
2	10'-6 1/2"	68'-0"	716.8 SQ. FT.
3	13'-5 1/2"	66'-0"	888.3 SQ. FT.
4	10'-11 1/2"	64'-0"	701.3 SQ. FT.
5	19'-3 1/2"	56'-0"	1080.3 SQ. FT.
6	12'-2"	64'-0"	778.7 SQ. FT.
7	10'-4"	61'-0"	630.3 SQ. FT.
8	8'-3 1/2"	57'-0"	472.6 SQ. FT.
9	24'-0"	59'-0"	1416.0 SQ. FT.
10	8'-3 1/2"	57'-0"	472.6 SQ. FT.
11	10'-3"	61'-0"	625.3 SQ. FT.
12	12'-3"	64'-0"	784.0 SQ. FT.
13	19'-3 1/2"	56'-0"	1080.3 SQ. FT.
14	10'-11 1/2"	64'-0"	701.3 SQ. FT.
15	24'-0"	68'-0"	1632.0 SQ. FT.
16	50'-0"	76'-2 1/2"	3810.4 SQ. FT.
TOTAL			15915.0 SQ. FT.



2 / Z-103 GROSS AREA DIAGRAM – 13TH– 20TH FLOOR
1/16" = 1'

	GROSS AREA CALCULATION - 13TH-20TH FLOORS		
TAG	LENGTH	WIDTH	AREA
1	3'-8"	68'-0"	124.7 SQ. FT.
2	10'-6 1/2"	68'-0"	716.8 SQ. FT.
3	13'-5 1/2"	66'-0"	888.3 SQ. FT.
4	10'-11 1/2"	64'-0"	701.3 SQ. FT.
5	19'-3 1/2"	56'-0"	1080.3 SQ. FT.
6	12'-2"	64'-0"	778.7 SQ. FT.
7	10'-4"	61'-0"	630.3 SQ. FT.
8	8'-3 1/2"	57'-0"	472.6 SQ. FT.
9	24'-0"	59'-0"	1416.0 SQ. FT.
10	8'-3 1/2"	57'-0"	472.6 SQ. FT.
11	10'-3"	61'-0"	625.3 SQ. FT.
12	12'-3"	64'-0"	784.0 SQ. FT.
13	19'-3 1/2"	56'-0"	1080.3 SQ. FT.
14	10'-11 1/2"	64'-0"	701.3 SQ. FT.
15	24'-0"	68'-0"	1632.0 SQ. FT.
16	50'-0"	73'-1 1/2"	3656.3 SQ. FT.
TOTAL			15760.8 SQ. FT.

KEY PLAN



BLOCK: 2319 LOT: 60

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RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ZONING ANALYSIS
FLOOR AREA DIAGRAMS

dob no

scale: AS INDICATED	project no.: 15–23
date: 2015–07–09	sheet no.: 10 OF
drawn: VV	drawing no.: Z-103.00
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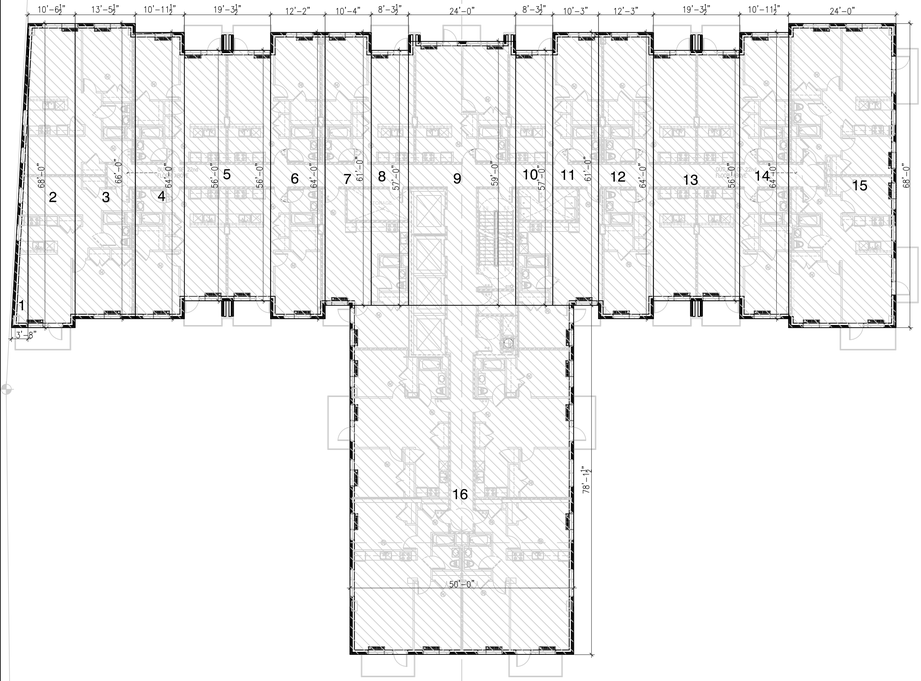
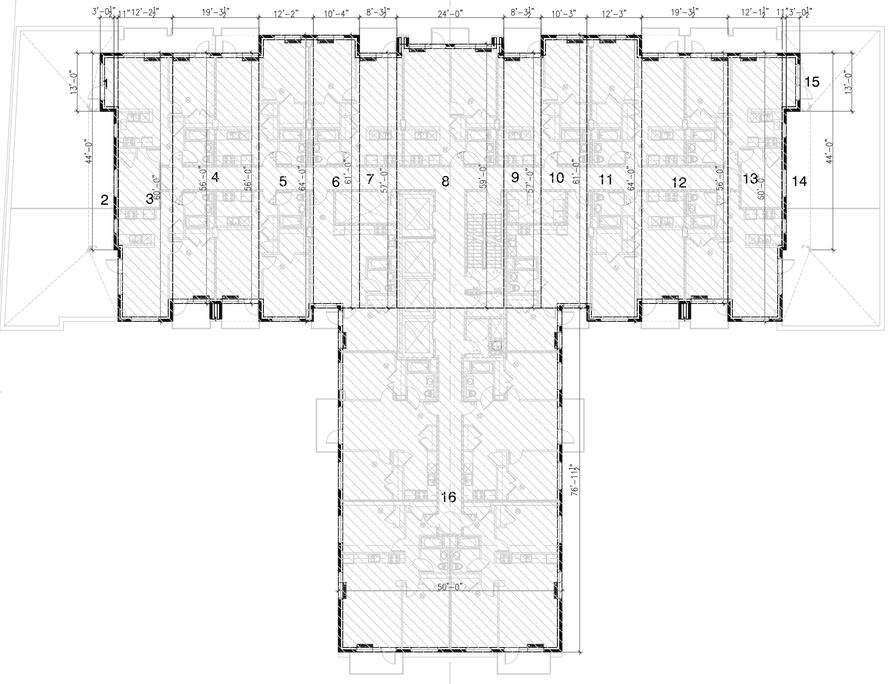


1/Z-104 GROSS AREA DIAGRAM – 21ST FLOOR
1/16" = 1'

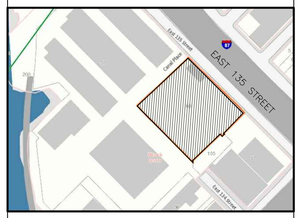
	GROSS AREA CALCULATION - 21ST FLOOR		
TAG	LENGTH	WIDTH	AREA
1	3'-8"	68'-0"	124.7 SQ. FT.
2	10'-6 1/2"	68'-0"	716.8 SQ. FT.
3	13'-5 1/2"	66'-0"	888.3 SQ. FT.
4	10'-11 1/2"	64'-0"	701.3 SQ. FT.
5	19'-3 1/2"	56'-0"	1080.3 SQ. FT.
6	12'-2"	64'-0"	778.7 SQ. FT.
7	10'-4"	61'-0"	630.3 SQ. FT.
8	8'-3 1/2"	57'-0"	472.6 SQ. FT.
9	24'-0"	59'-0"	1416.0 SQ. FT.
10	8'-3 1/2"	57'-0"	472.6 SQ. FT.
11	10'-3"	61'-0"	625.3 SQ. FT.
12	12'-3"	64'-0"	784.0 SQ. FT.
13	19'-3 1/2"	56'-0"	1080.3 SQ. FT.
14	10'-11 1/2"	64'-0"	701.3 SQ. FT.
15	24'-0"	68'-0"	1632.0 SQ. FT.
16	50'-0"	78'-1 1/2"	3906.3 SQ. FT.
TOTAL			16010.8 SQ. FT.



2/Z-104 GROSS AREA DIAGRAM – 22ND FLOOR
1/16" = 1'

	GROSS AREA CALCULATION - 22ND FLOOR		
TAG	LENGTH	WIDTH	AREA
1	3'-0 1/2"	13'-0"	39.5 SQ. FT.
2	0'-11"	44'-0"	40.3 SQ. FT.
3	12'-2 1/2"	60'-0"	732.5 SQ. FT.
4	19'-3 1/2"	56'-0"	1080.3 SQ. FT.
5	12'-2"	64'-0"	778.7 SQ. FT.
6	10'-4"	61'-0"	630.3 SQ. FT.
7	8'-3 1/2"	57'-0"	472.6 SQ. FT.
8	24'-0"	59'-0"	1416.0 SQ. FT.
9	8'-3 1/2"	57'-0"	472.6 SQ. FT.
10	10'-3"	61'-0"	625.3 SQ. FT.
11	12'-3"	64'-0"	784.0 SQ. FT.
12	19'-3 1/2"	56'-0"	1080.3 SQ. FT.
13	12'-1 1/2"	60'-0"	727.5 SQ. FT.
14	0'-11"	44'-0"	40.3 SQ. FT.
15	3'-0 1/2"	13'-0"	39.5 SQ. FT.
16	50'-0"	76'-11 1/2"	3847.9 SQ. FT.
TOTAL			12807.8 SQ. FT.

KEY PLAN



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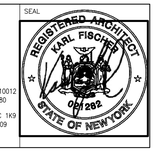

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FLOOR AREA DIAGRAMS

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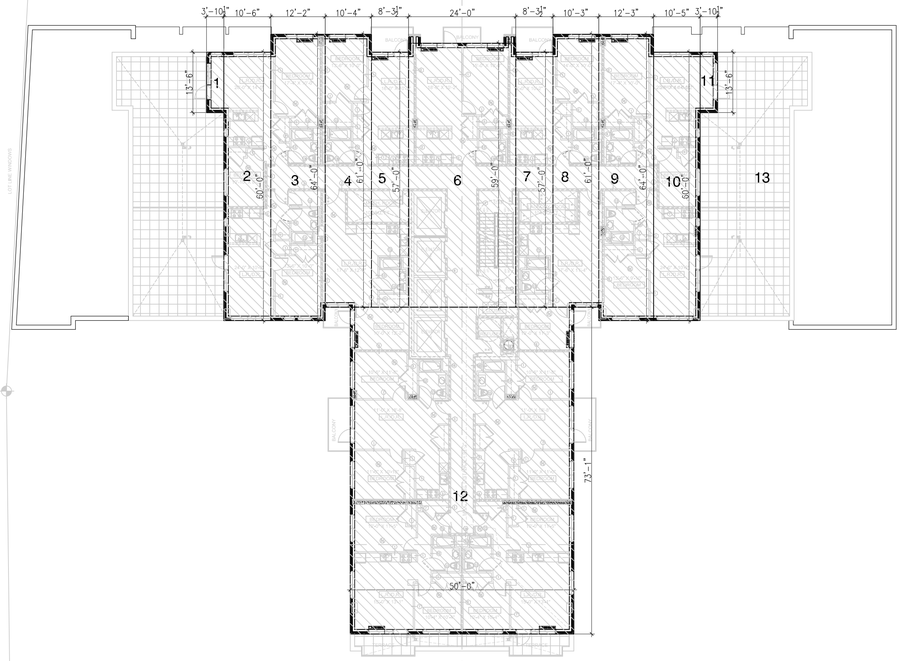
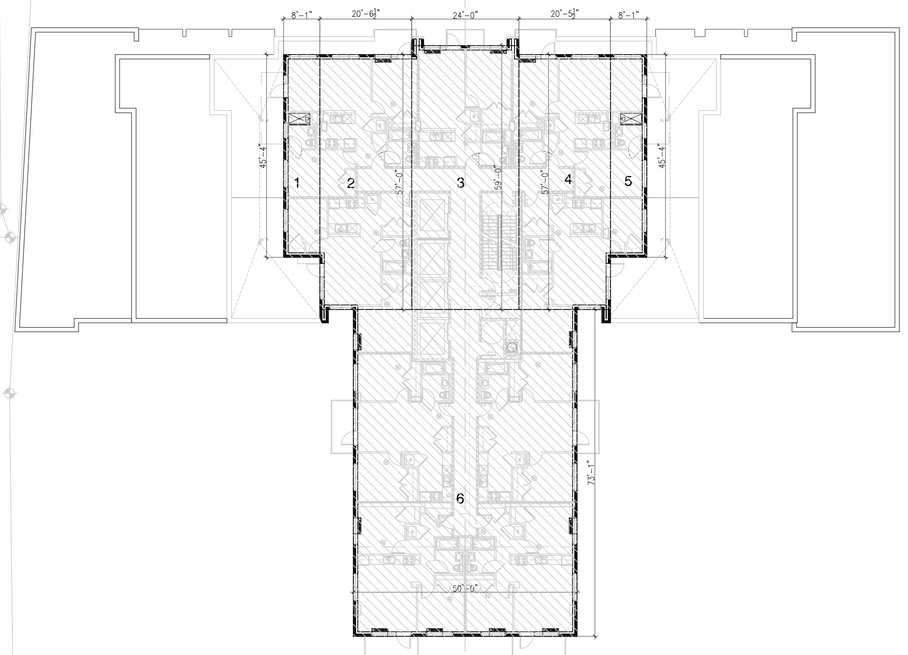


1 / Z-105 GROSS AREA DIAGRAM – 23RD FLOOR
1/16" = 1'

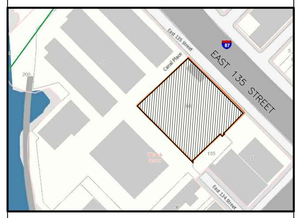
	GROSS AREA CALCULATION - 23RD FLOOR		
TAG	LENGTH	WIDTH	AREA
1	3'-10 1/2"	13'-6"	52.3 SQ. FT.
2	10'-6"	60'-0"	630.0 SQ. FT.
3	12'-2"	64'-0"	778.7 SQ. FT.
4	10'-4"	61'-0"	630.3 SQ. FT.
5	8'-3 1/2"	57'-0"	472.6 SQ. FT.
6	24'-0"	59'-0"	1416.0 SQ. FT.
7	8'-3 1/2"	57'-0"	472.6 SQ. FT.
8	10'-3"	61'-0"	625.3 SQ. FT.
9	12'-3"	64'-0"	784.0 SQ. FT.
10	10'-5"	60'-0"	625.0 SQ. FT.
11	3'-10 1/2"	13'-6"	52.3 SQ. FT.
12	50'-0"	73'-1"	3654.2 SQ. FT.
TOTAL			10193.3 SQ. FT.



2 / Z-105 GROSS AREA DIAGRAM – 24TH FLOOR
1/16" = 1'

	GROSS AREA CALCULATION - 24TH FLOOR		
TAG	LENGTH	WIDTH	AREA
1	8'-1"	45'-4"	366.4 SQ. FT.
2	20'-6 1/2"	57'-0"	1170.9 SQ. FT.
3	24'-0"	59'-0"	1416.0 SQ. FT.
4	20'-5 1/2"	57'-0"	1166.1 SQ. FT.
5	8'-1"	45'-4"	366.4 SQ. FT.
6	50'-0"	73'-1"	3654.2 SQ. FT.
TOTAL			8140.1 SQ. FT.

KEY PLAN



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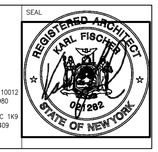

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ZONING ANALYSIS
FLOOR AREA DIAGRAMS

dob no

scale: AS INDICATED	project no.: 15-23
date: 2015-07-09	sheet no.: 10 OF
drawn: VV	drawing no.: Z-105.00
checked: KF	

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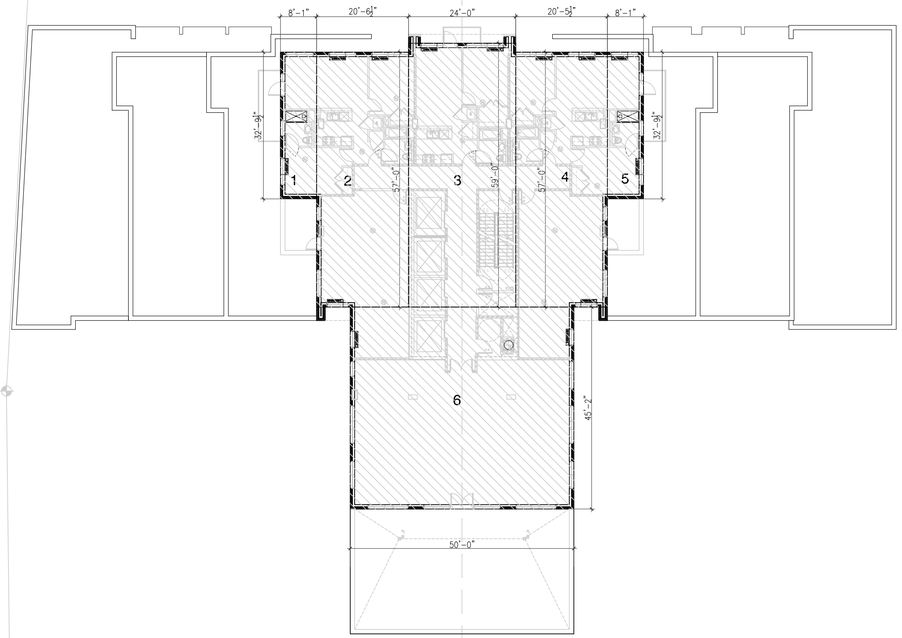
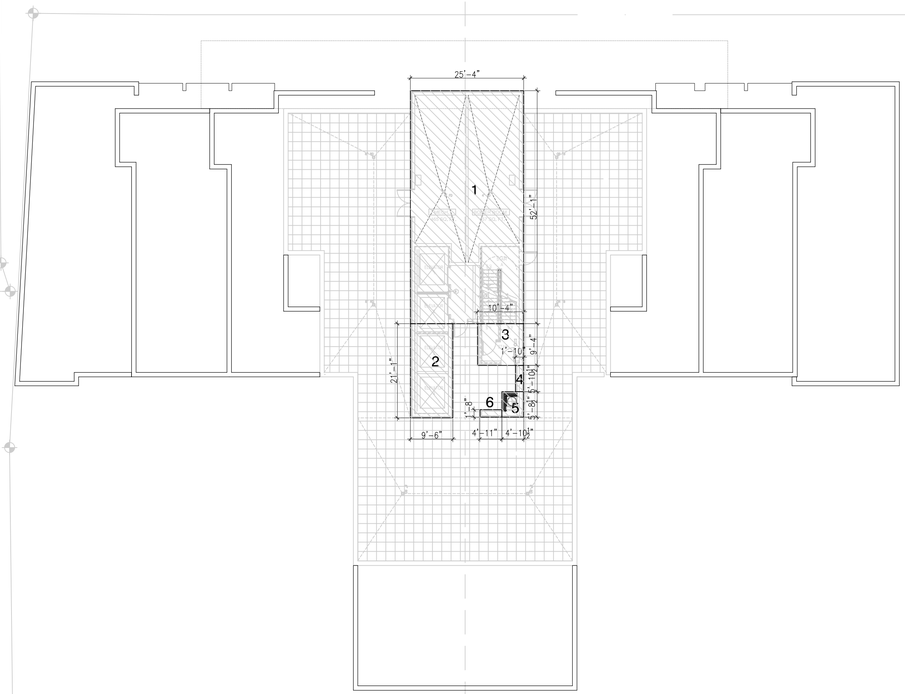


1 / Z-106 GROSS AREA DIAGRAM – 25TH FLOOR
1/16" = 1'

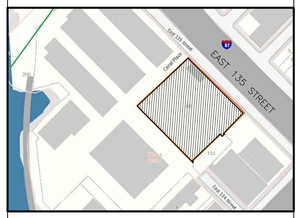
	GROSS AREA CALCULATION - 25TH FLOOR		
TAG	LENGTH	WIDTH	AREA
1	8'-1"	32'-9 1/2"	265.1 SQ. FT.
2	20'-6 1/2"	57'-0"	1170.9 SQ. FT.
3	24'-0"	59'-0"	1416.0 SQ. FT.
4	20'-5 1/2"	57'-0"	1166.1 SQ. FT.
5	8'-1"	32'-9 1/2"	265.1 SQ. FT.
6	50'-0"	45'-2"	2258.3 SQ. FT.
TOTAL			6541.5 SQ. FT.

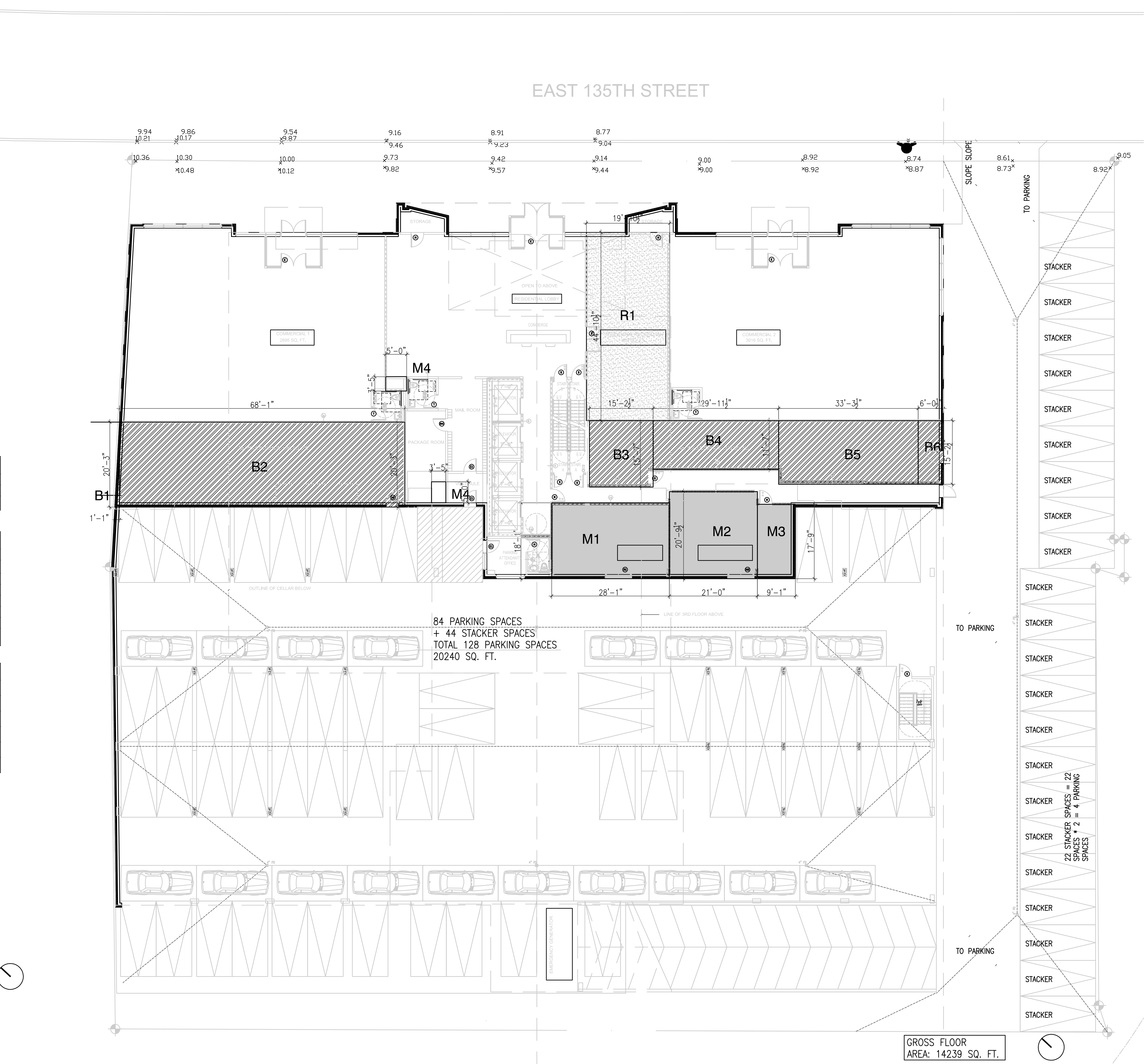


	GROSS AREA CALCULATION - BULKHEAD		
TAG	LENGTH	WIDTH	AREA
1	25'-4"	52'-1"	1319.4 SQ. FT.
2	9'-6"	21'-1"	200.3 SQ. FT.
3	10'-4"	9'-4"	96.4 SQ. FT.
4	1'-10"	5'-10 1/2"	10.8 SQ. FT.
5	4'-10 1/2"	5'-8 1/2"	27.8 SQ. FT.
6	4'-11"	1'-8"	8.2 SQ. FT.
TOTAL			1663.0 SQ. FT.

2 / Z-106 GROSS AREA DIAGRAM – BULKHEAD
1/16" = 1'

KEY PLAN





84 PARKING SPACES
+ 44 STACKER SPACES
TOTAL 128 PARKING SPACES
20240 SQ. FT.

GROSS FLOOR
AREA: 14239 SQ. FT.

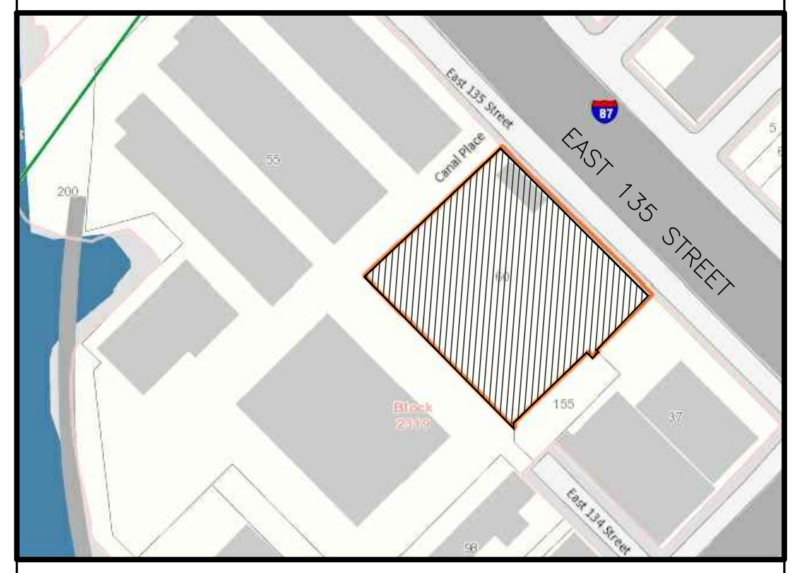
1
Z-107
DEDUCTION AREA DIAGRAM – 1ST FLOOR
1/16" = 1'

	DEDUCTION CALC - RECREATION ROOM		
TAG	LENGTH	WIDTH	AREA
R1	19'-10 1/2"	44'-10 1/2"	891.9 SQ. FT.
TOTAL RECREATION RM			891.9 SQ. FT.

	DEDUCTION CALC - BICYCLE STORAGE		
TAG	LENGTH	WIDTH	AREA
B1	1'-1"	20'-3"	11.0 SQ. FT.
B2	68'-1"	20'-3"	1378.7 SQ. FT.
B3	15'-2 1/2"	15'-7"	237.0 SQ. FT.
B4	29'-11 1/2"	11'-7"	347.0 SQ. FT.
B5	33'-3 1/2"	15'-2 1/2"	506.3 SQ. FT.
B6	6'-0 1/2"	15'-2 1/2"	91.9 SQ. FT.
TOTAL			2571.9 SQ. FT.

	MECHANICAL DEDUCTIONS				
TAG	LENGTH	WIDTH	AREA	QTY.	TOTAL AREA
M1	18'-1"	28'-1"	507.8 SQ. FT.	1	507.8 SQ. FT.
M2	21'-0"	20'-9 1/2"	436.6 SQ. FT.	1	436.6 SQ. FT.
M3	9'-1"	17'-9"	161.2 SQ. FT.	1	161.2 SQ. FT.
M4	3'-5"	5'-0"	17.1 SQ. FT.	2	34.2 SQ. FT.
TOTAL					1139.9 SQ. FT.

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

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021282
STATE OF NEW YORK

project title
RESIDENTIAL
DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ZONING ANALYSIS
DEDUCTION AREA DIAGRAM

dob no

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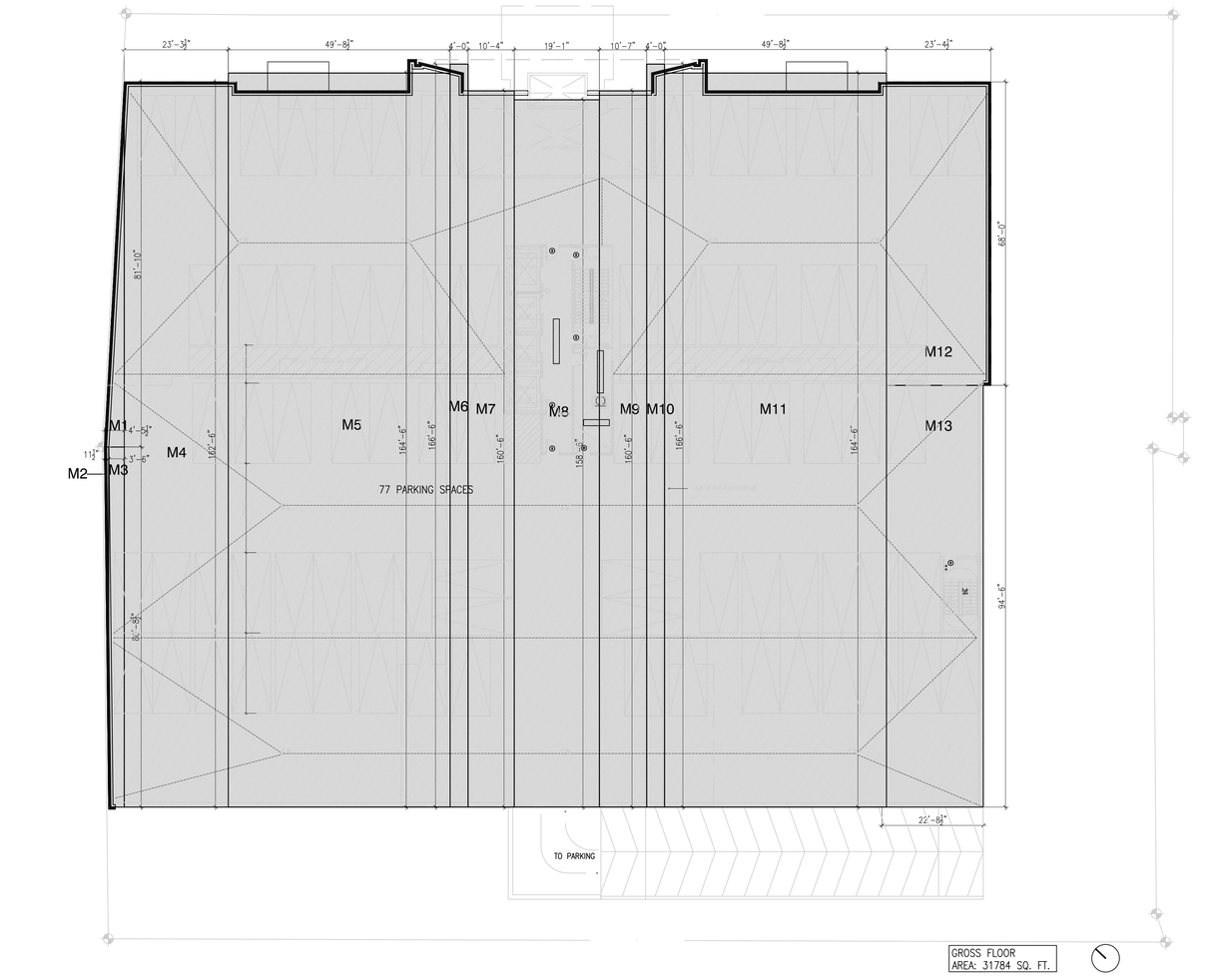
EAST 135TH STREET

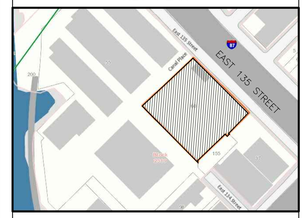


	MECHANICAL DEDUCTIONS				
TAG	LENGTH	WIDTH	AREA	QTY.	TOTAL AREA
M1	4'-5 1/2"	81'-10"	182.4 SQ. FT.	1	182.4 SQ. FT.
M2	0'-11 1/2"	80'-8 1/2"	38.7 SQ. FT.	1	38.7 SQ. FT.
M3	3'-6"	80'-8 1/2"	282.5 SQ. FT.	1	282.5 SQ. FT.
M4	23'-3 1/2"	162'-6"	3784.9 SQ. FT.	1	3784.9 SQ. FT.
M5	49'-8 1/2"	164'-6"	8177.0 SQ. FT.	1	8177.0 SQ. FT.
M6	4'-0"	166'-6"	666.0 SQ. FT.	1	666.0 SQ. FT.
M7	10'-4"	160'-6"	1658.5 SQ. FT.	1	1658.5 SQ. FT.
M8	19'-1"	158'-6"	3024.7 SQ. FT.	1	3024.7 SQ. FT.
M9	10'-7"	160'-6"	1698.6 SQ. FT.	1	1698.6 SQ. FT.
M10	4'-0"	166'-6"	666.0 SQ. FT.	1	666.0 SQ. FT.
M11	49'-8 1/2"	164'-6"	8177.0 SQ. FT.	1	8177.0 SQ. FT.
M12	23'-4 1/2"	68'-0"	1589.5 SQ. FT.	1	1589.5 SQ. FT.
M13	22'-8 1/2"	94'-6"	2145.9 SQ. FT.	1	2145.9 SQ. FT.
TOTAL					32091.8 SQ. FT.

TOTAL DEDUCTION	32,091.8 SQ. FT.

1 / Z-108 DEDUCTION AREA DIAGRAM – 2ND FLOOR
1/16" = 1'

KEY PLAN



BLOCK: 2319 LOT: 60

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DEDUCTION AREA DIAGRAM

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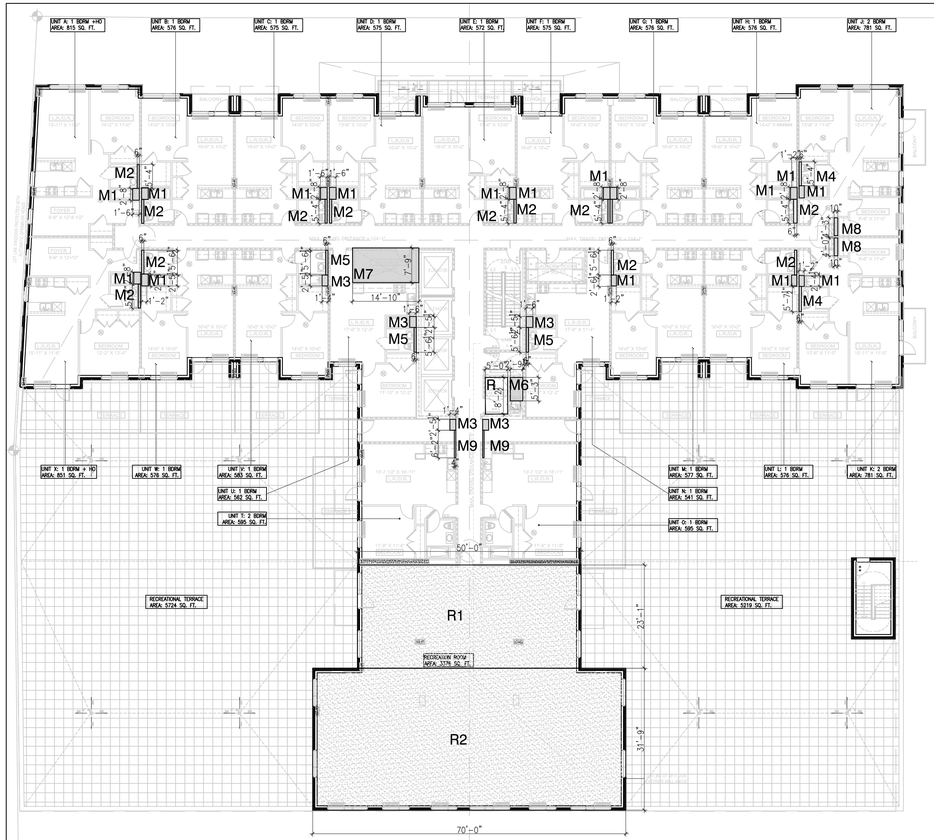


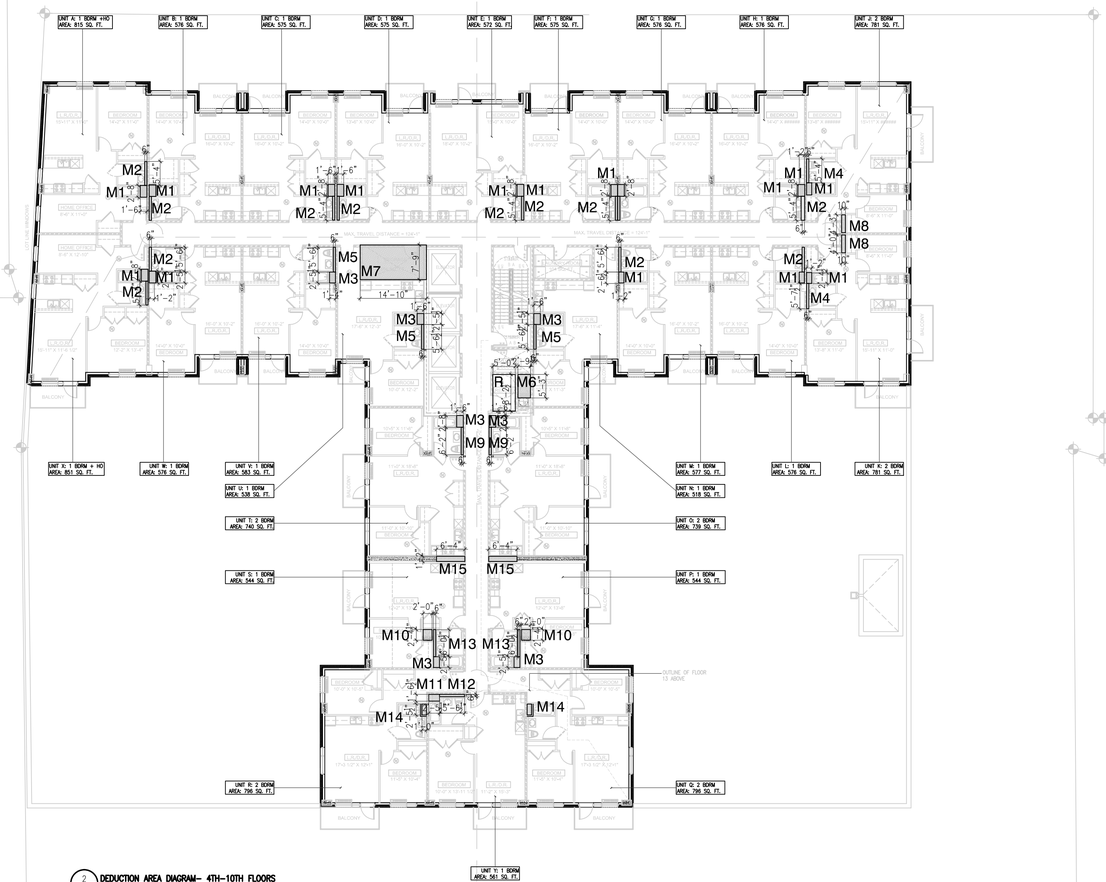
1 Z-108 DEDUCTION AREA DIAGRAM – 3RD FLOOR
1/16" = 1'

GROSS FLOOR
AREA: 17702 SQ. FT.

	DEDUCTION CALC - RECREATION ROOM		
TAG	LENGTH	WIDTH	AREA
R1	50'-0"	23'-1"	1154.2 SQ. FT.
R2	70'-0"	31'-9"	2222.5 SQ. FT.
TOTAL RECREATION RM			3376.7 SQ. FT.

	DEDUCTION CALC - REFUSE RM		
TAG	LENGTH	WIDTH	AREA
R	5'-0"	8'-2 1/2"	41.0 SQ. FT.
MAX DEDUCTIBLE			12 SQ. FT.

	MECHANICAL DEDUCTIONS				
TAG	LENGTH	WIDTH	AREA	QTY.	TOTAL AREA
M1	1'-6"	2'-8"	4.0 SQ. FT.	14	56.0 SQ. FT.
M2	0'-6"	5'-4"	2.7 SQ. FT.	12	32.0 SQ. FT.
M3	1'-4"	2'-8"	4.0 SQ. FT.	7	28.0 SQ. FT.
M4	0'-6"	5'-7 1/2"	2.8 SQ. FT.	2	5.6 SQ. FT.
M5	0'-6"	5'-6 1/2"	2.8 SQ. FT.	3	8.3 SQ. FT.
M6	2'-9 1/2"	5'-3"	14.7 SQ. FT.	1	14.7 SQ. FT.
M7	14'-10"	7'-9"	115.0 SQ. FT.	1	115.0 SQ. FT.
M8	0'-10"	4'-3"	3.5 SQ. FT.	2	7.1 SQ. FT.
M9	0'-6"	6'-2"	3.1 SQ. FT.	2	6.2 SQ. FT.
TOTAL					261.2 SQ. FT.



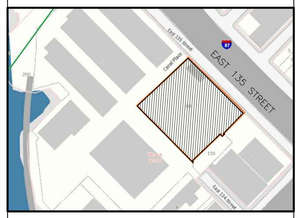
	DEDUCTION CALC - REFUSE RM		
TAG	LENGTH	WIDTH	AREA
R	5'-0"	8'-2 1/2"	41.0 SQ. FT.
MAX DEDUCTIBLE			12 SQ. FT.

	MECHANICAL DEDUCTIONS				
TAG	LENGTH	WIDTH	AREA	QTY.	TOTAL AREA
M1	1'-6"	2'-8"	4.0 SQ. FT.	14	56.0 SQ. FT.
M2	0'-6"	5'-4"	2.7 SQ. FT.	12	32.0 SQ. FT.
M3	1'-4"	2'-8"	4.0 SQ. FT.	7	28.0 SQ. FT.
M4	0'-6"	5'-7 1/2"	2.8 SQ. FT.	2	5.6 SQ. FT.
M5	0'-6"	5'-6 1/2"	2.8 SQ. FT.	3	8.3 SQ. FT.
M6	2'-9 1/2"	5'-3"	14.7 SQ. FT.	1	14.7 SQ. FT.
M7	14'-10"	7'-9"	115.0 SQ. FT.	1	115.0 SQ. FT.
M8	0'-10"	4'-3"	3.5 SQ. FT.	2	7.1 SQ. FT.
M9	0'-6"	6'-2"	3.1 SQ. FT.	2	6.2 SQ. FT.
M10	2'-0"	2'-4"	4.7 SQ. FT.	2	9.3 SQ. FT.
M11	2'-5 1/2"	1'-6 1/2"	3.8 SQ. FT.	1	3.8 SQ. FT.
M12	5'-6 1/2"	0'-6 1/2"	3.0 SQ. FT.	1	3.0 SQ. FT.
M13	0'-6"	6'-0 1/2"	3.0 SQ. FT.	2	6.0 SQ. FT.
M14	1'-0"	2'-5 1/2"	2.5 SQ. FT.	2	4.9 SQ. FT.
M15	1'-2"	6'-4"	7.4 SQ. FT.	2	14.8 SQ. FT.
TOTAL					314.7 SQ. FT.

2 Z-109 DEDUCTION AREA DIAGRAM– 4TH–10TH FLOORS
1/16" = 1'

GROSS FLOOR

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

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DEDUCTION AREA DIAGRAM

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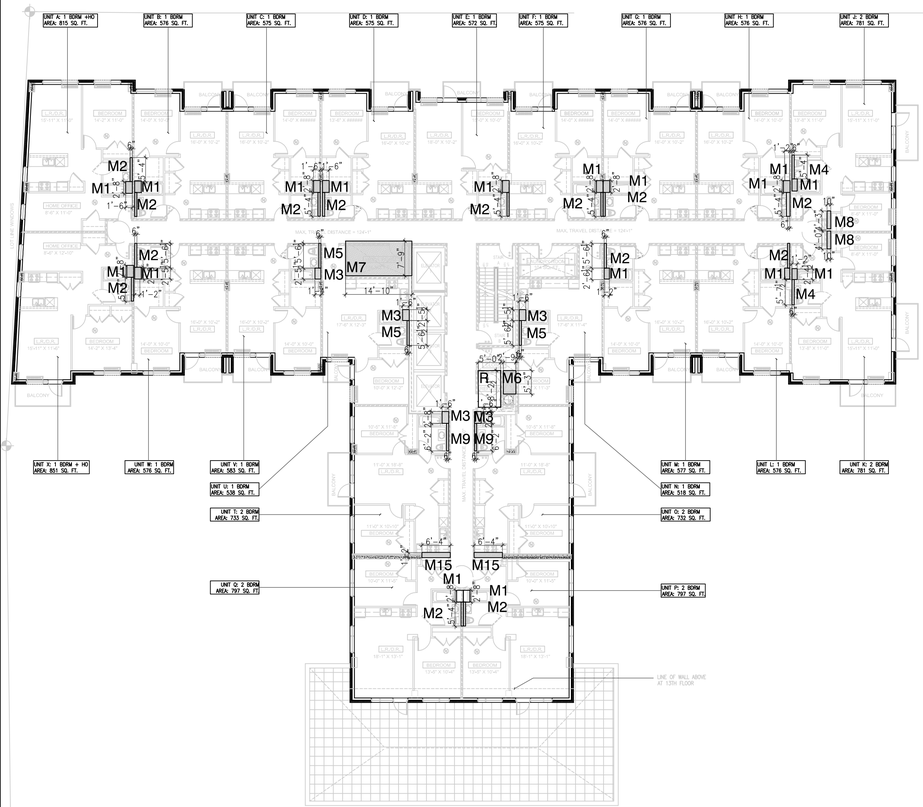


1 DEDUCTION AREA DIAGRAM – 11TH FLOOR
Z-110 1/16" = 1'

	DEDUCTION CALC - REFUSE RM		
TAG	LENGTH	WIDTH	AREA
R	5'-0"	8'-2 1/2"	41.0 SQ. FT.
MAX DEDUCTIBLE			12 SQ. FT.

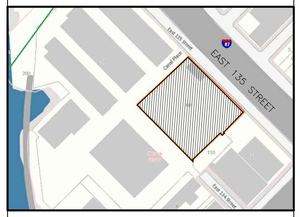
	MECHANICAL DEDUCTIONS				
TAG	LENGTH	WIDTH	AREA	QTY.	TOTAL AREA
M1	1'-6"	2'-8"	4.0 SQ. FT.	14	56.0 SQ. FT.
M2	0'-6"	5'-6 1/2"	2.8 SQ. FT.	12	33.3 SQ. FT.
M3	1'-6"	2'-8"	4.0 SQ. FT.	5	20.0 SQ. FT.
M4	0'-6"	5'-7 1/2"	2.8 SQ. FT.	2	5.6 SQ. FT.
M5	0'-6"	5'-6 1/2"	2.8 SQ. FT.	3	8.3 SQ. FT.
M6	2'-9 1/2"	5'-3"	14.7 SQ. FT.	1	14.7 SQ. FT.
M7	14'-10"	7'-9"	115.0 SQ. FT.	1	115.0 SQ. FT.
M8	0'-10"	4'-3"	3.5 SQ. FT.	2	7.1 SQ. FT.
M9	0'-6"	6'-2"	3.1 SQ. FT.	2	6.2 SQ. FT.
M10	1'-0"	2'-5 1/2"	2.5 SQ. FT.	2	4.9 SQ. FT.
M11	0'-9"	0'-9 1/2"	0.6 SQ. FT.	2	1.2 SQ. FT.
M15	1'-2"	6'-4"	7.4 SQ. FT.	2	14.8 SQ. FT.
TOTAL					286.9 SQ. FT.

GROSS FLOOR

2 DEDUCTION AREA DIAGRAM – 12TH– 21ST FLOOR
Z-110 1/16" = 1'

GROSS FLOOR

KEY PLAN



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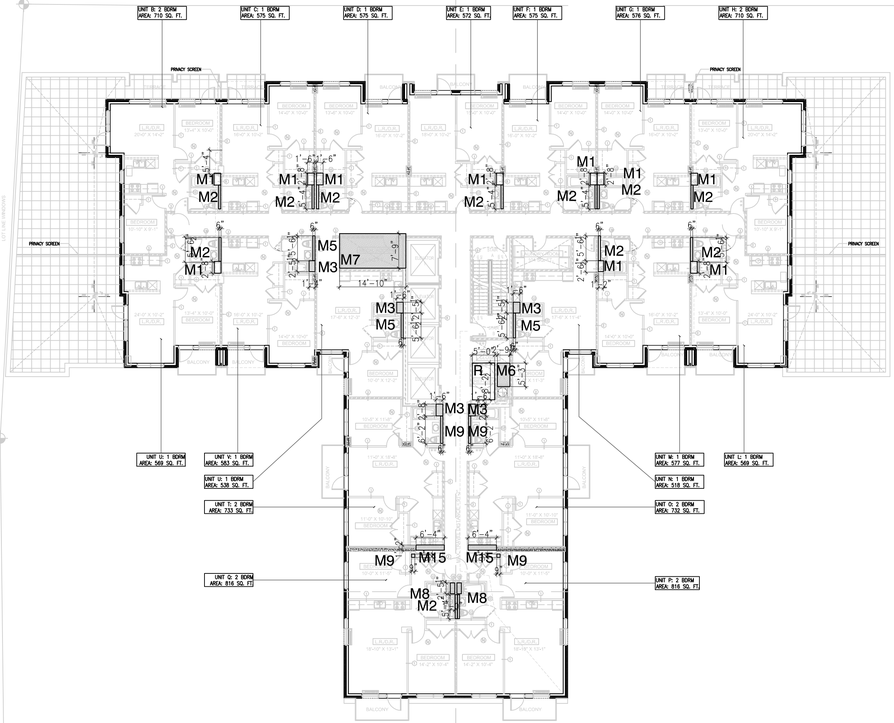
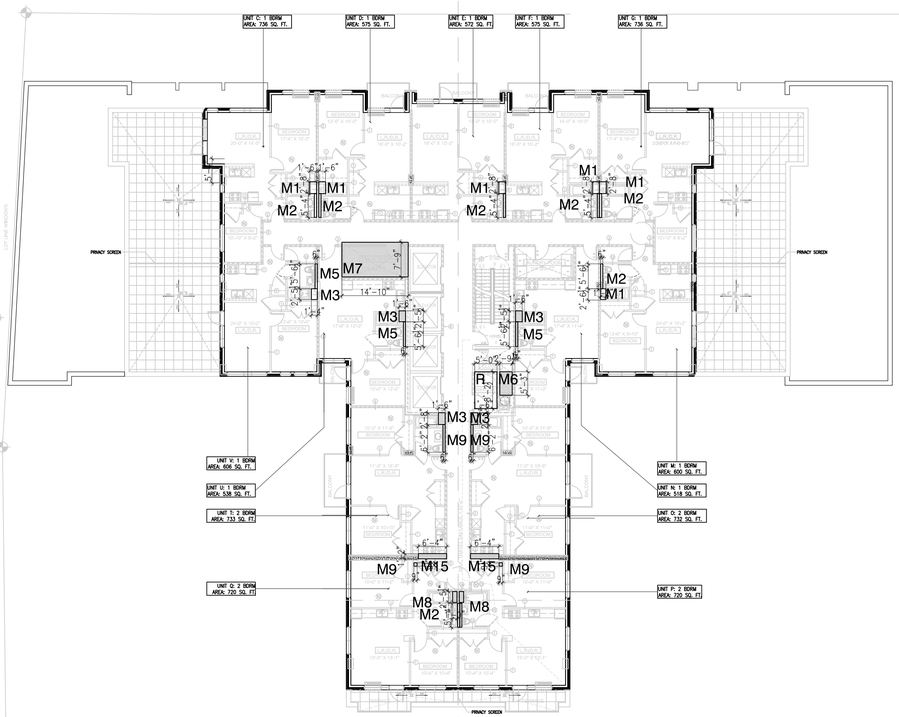


1 Z-111 **DEDUCTION AREA DIAGRAM- 22TH FLOOR**
1/16" = 1'

GROSS FLOOR
AREA: 12807 SQ. FT.

	DEDUCTION CALC - REFUSE RM		
TAG	LENGTH	WIDTH	AREA
R	5'-0"	8'-2 1/2"	41.0 SQ. FT.
MAX DEDUCTIBLE			12 SQ. FT.

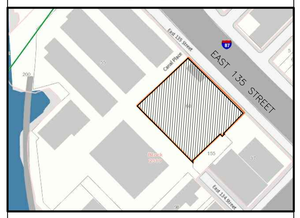
	MECHANICAL DEDUCTIONS				
TAG	LENGTH	WIDTH	AREA	QTY.	TOTAL AREA
M1	1'-6"	2'-5 1/2"	3.7 SQ. FT.	6	22.1 SQ. FT.
M2	0'-6"	5'-6 1/2"	2.8 SQ. FT.	6	16.6 SQ. FT.
M3	1'-6"	2'-5 1/2"	3.7 SQ. FT.	5	18.4 SQ. FT.
M4	0'-6"	5'-6 1/2"	2.8 SQ. FT.	2	5.5 SQ. FT.
M5	2'-9 1/2"	5'-3"	14.7 SQ. FT.	1	14.7 SQ. FT.
M6	14'-10"	7'-9"	115.0 SQ. FT.	1	115.0 SQ. FT.
M7	0'-6"	6'-2"	3.1 SQ. FT.	2	6.2 SQ. FT.
M8	1'-0"	2'-5 1/2"	2.5 SQ. FT.	2	4.9 SQ. FT.
M9	0'-9"	0'-9 1/2"	0.6 SQ. FT.	2	1.2 SQ. FT.
M15	6'-4"	1'-2"	7.4 SQ. FT.	2	14.8 SQ. FT.
TOTAL					219.4 SQ. FT.



2 Z-111 **DEDUCTION AREA DIAGRAM - 23RD FLOOR**
1/16" = 1'

GROSS FLOOR
AREA: 10193 SQ. FT.

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

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RESIDENTIAL
DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ZONING ANALYSIS
DEDUCTION AREA DIAGRAM

dob no

scale AS INDICATED	project no. 15–23
date 2015–07–09	sheet no. 10 OF
drawn VV	drawing no. Z-111.00
checked KF	

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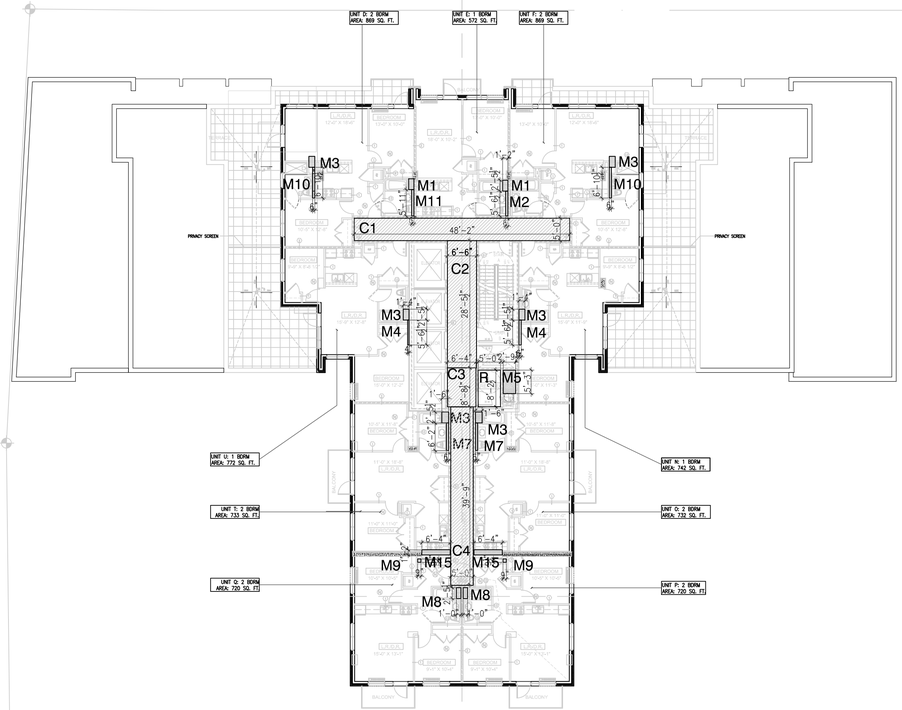


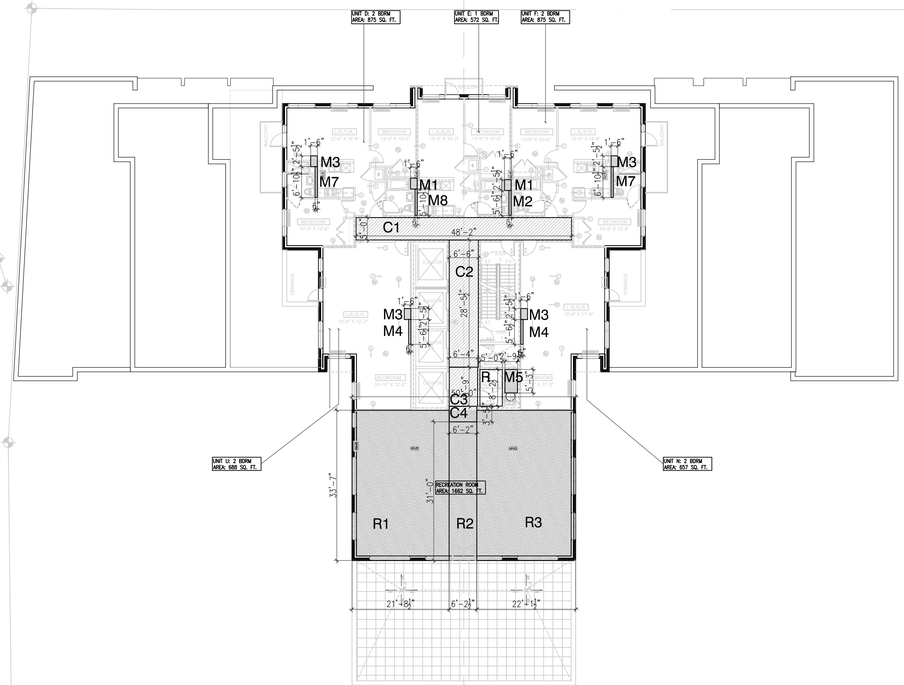
1 / Z-112 **DEDUCTION AREA DIAGRAM - 24TH FLOOR**
1/16" = 1'

	DEDUCTION CALC - CORRIDOR - 2ND		
TAG	LENGTH	WIDTH	AREA
C1	5'-0"	48'-2"	240.8 SQ. FT.
C2	6'-6"	28'-5 1/2"	185.0 SQ. FT.
C3	6'-4"	8'-8 1/2"	55.2 SQ. FT.
C4	5'-0"	39'-9"	198.8 SQ. FT.
TOTAL CORRIDOR AREA			679.7 SQ. FT.
DENSITY DEDUCTION			339.9 SQ. FT.

	DEDUCTION CALC - REFUSE RM		
TAG	LENGTH	WIDTH	AREA
R	5'-0"	8'-2 1/2"	41.0 SQ. FT.
MAX DEDUCTIBLE			12 SQ. FT.

	MECHANICAL DEDUCTIONS				
TAG	LENGTH	WIDTH	AREA	QTY.	TOTAL AREA
M1	1'-4"	2'-5 1/2"	3.3 SQ. FT.	2	6.6 SQ. FT.
M2	0'-6"	5'-6 1/2"	2.8 SQ. FT.	1	2.8 SQ. FT.
M3	1'-6"	2'-5 1/2"	3.7 SQ. FT.	6	22.1 SQ. FT.
M4	0'-6"	5'-6 1/2"	2.8 SQ. FT.	2	5.5 SQ. FT.
M5	2'-9 1/2"	5'-3"	14.7 SQ. FT.	1	14.7 SQ. FT.
M7	0'-6"	6'-2"	3.1 SQ. FT.	2	6.2 SQ. FT.
M8	0'-2"	2'-5 1/2"	0.4 SQ. FT.	2	0.8 SQ. FT.
M9	0'-9"	0'-9 1/2"	0.6 SQ. FT.	2	1.2 SQ. FT.
M10	6'-10 1/2"	0'-6"	3.4 SQ. FT.	2	6.9 SQ. FT.
M11	5'-11"	0'-6"	3.0 SQ. FT.	1	3.0 SQ. FT.
M11	6'-4"	1'-2"	7.4 SQ. FT.	2	14.8 SQ. FT.
TOTAL					84.4 SQ. FT.

GROSS FLOOR



2 / Z-112 **DEDUCTION AREA DIAGRAM - 25TH FLOOR**
1/16" = 1'

	DEDUCTION CALC - RECREATION ROOM		
TAG	LENGTH	WIDTH	AREA
R1	33'-7"	21'-8 1/2"	729.0 SQ. FT.
R2	6'-2 1/2"	31'-0"	192.5 SQ. FT.
R3	33'-7"	22'-1 1/2"	743.0 SQ. FT.
TOTAL RECREATION RM			1664.5 SQ. FT.

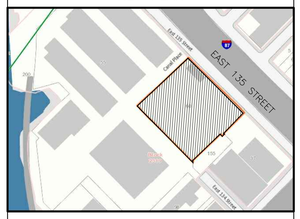
	DEDUCTION CALC - CORRIDOR - 2ND		
TAG	LENGTH	WIDTH	AREA
C1	5'-0"	48'-2"	240.8 SQ. FT.
C2	6'-6"	28'-5 1/2"	185.0 SQ. FT.
C3	6'-4"	8'-8"	55.4 SQ. FT.
C4	6'-2"	3'-5 1/2"	21.3 SQ. FT.
TOTAL CORRIDOR AREA			502.6 SQ. FT.
DENSITY DEDUCTION			251.3 SQ. FT.

	DEDUCTION CALC - REFUSE RM		
TAG	LENGTH	WIDTH	AREA
R	5'-0"	8'-2 1/2"	41.0 SQ. FT.
MAX DEDUCTIBLE			12 SQ. FT.

	MECHANICAL DEDUCTIONS				
TAG	LENGTH	WIDTH	AREA	QTY.	TOTAL AREA
M1	1'-4"	2'-5 1/2"	3.7 SQ. FT.	2	7.4 SQ. FT.
M2	0'-6"	5'-6 1/2"	2.8 SQ. FT.	2	5.5 SQ. FT.
M3	1'-6"	2'-5 1/2"	3.7 SQ. FT.	4	14.8 SQ. FT.
M4	0'-6"	5'-6 1/2"	2.8 SQ. FT.	2	5.5 SQ. FT.
M5	2'-9 1/2"	5'-3"	14.7 SQ. FT.	1	14.7 SQ. FT.
M7	6'-10 1/2"	0'-6"	3.4 SQ. FT.	2	6.9 SQ. FT.
M8	5'-10 1/2"	0'-6"	2.9 SQ. FT.	1	2.9 SQ. FT.
TOTAL					57.7 SQ. FT.

GROSS FLOOR

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
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ISSUES/REVISIONS

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project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ZONING ANALYSIS
DEDUCTION AREA DIAGRAM

dob no

scale: AS INDICATED	project no.: 15-23
date: 2015-07-09	sheet no.: 10 OF
drawn: VV	drawing no.: Z-112.00
checked: KF	

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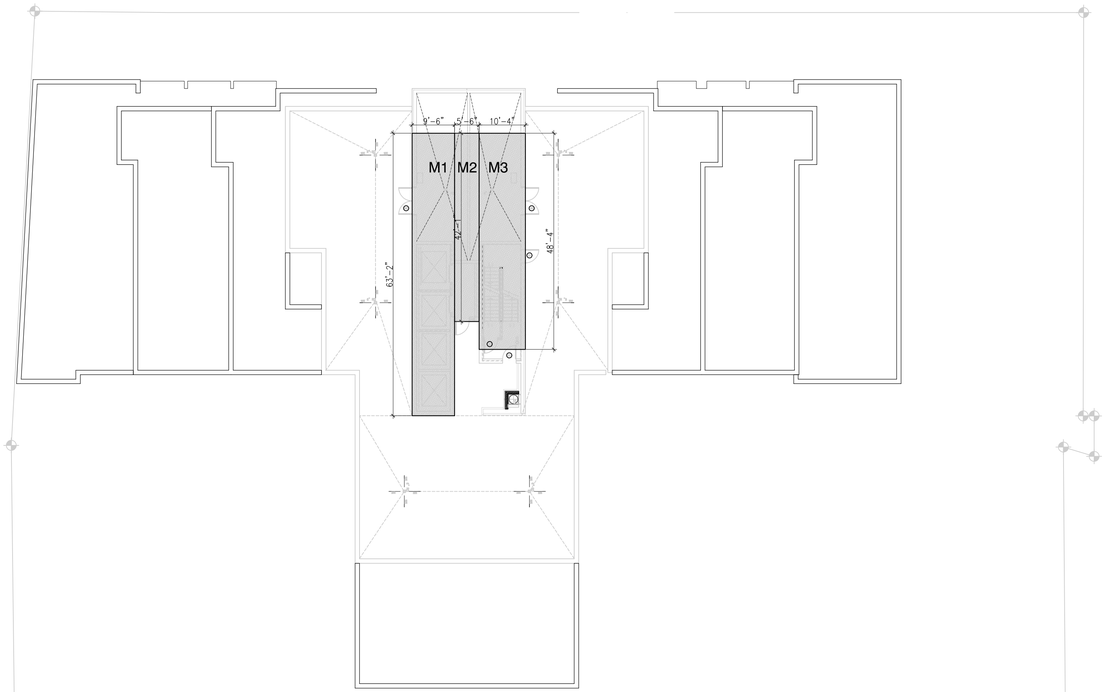
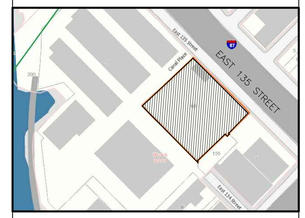


	MECHANICAL DEDUCTIONS				
TAG	LENGTH	WIDTH	AREA	QTY.	TOTAL AREA
M1	9'-6"	63'-2"	600.1 SQ. FT.	1	600.1 SQ. FT.
M2	5'-6"	42'-1"	231.5 SQ. FT.	1	231.5 SQ. FT.
M3	10'-4"	48'-4"	499.4 SQ. FT.	2	998.9 SQ. FT.
TOTAL					1830.4 SQ. FT.

TOTAL DEDUCTION	1,830.4 SQ .FT.

1 / Z-113 DEDUCTION AREA DIAGRAM – 25TH FLOOR
1/16" = 1'

KEY PLAN



BLOCK: 2319 LOT: 60

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SEAL

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project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ZONING ANALYSIS
DEDUCTION AREA DIAGRAM

dob no

scale: AS INDICATED	project no.: 15-23
date: 2015-07-09	sheet no.: 10OF
drawn: VV	drawing no.: Z-113.00
checked: KF	

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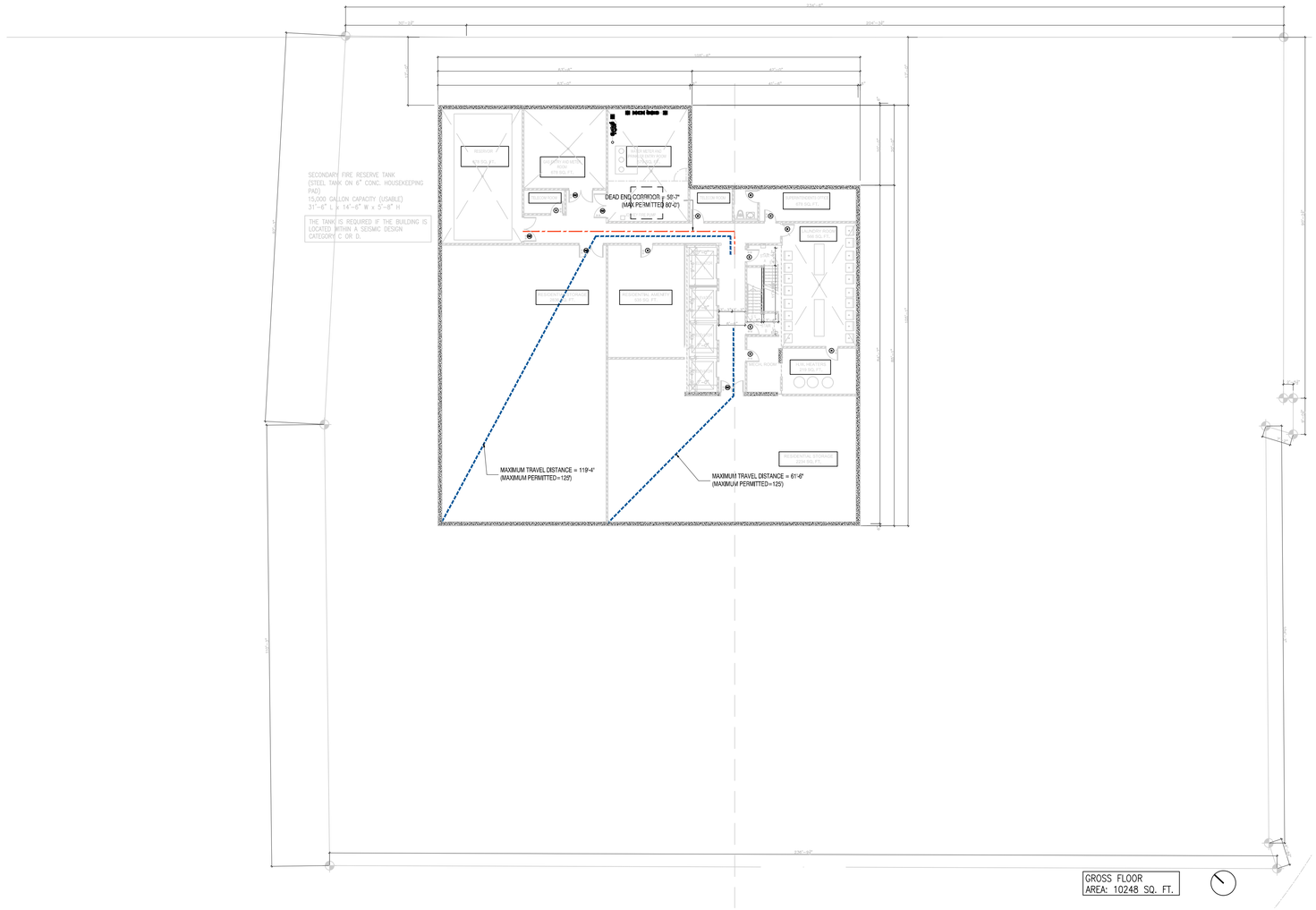

EGRESS DIAGRAM – CELLAR
1/16" = 1'

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KEY PLAN

BLOCK: 2319 LOT: 60

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1		15/08/03	ISSUED TO D.O.B.

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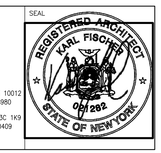
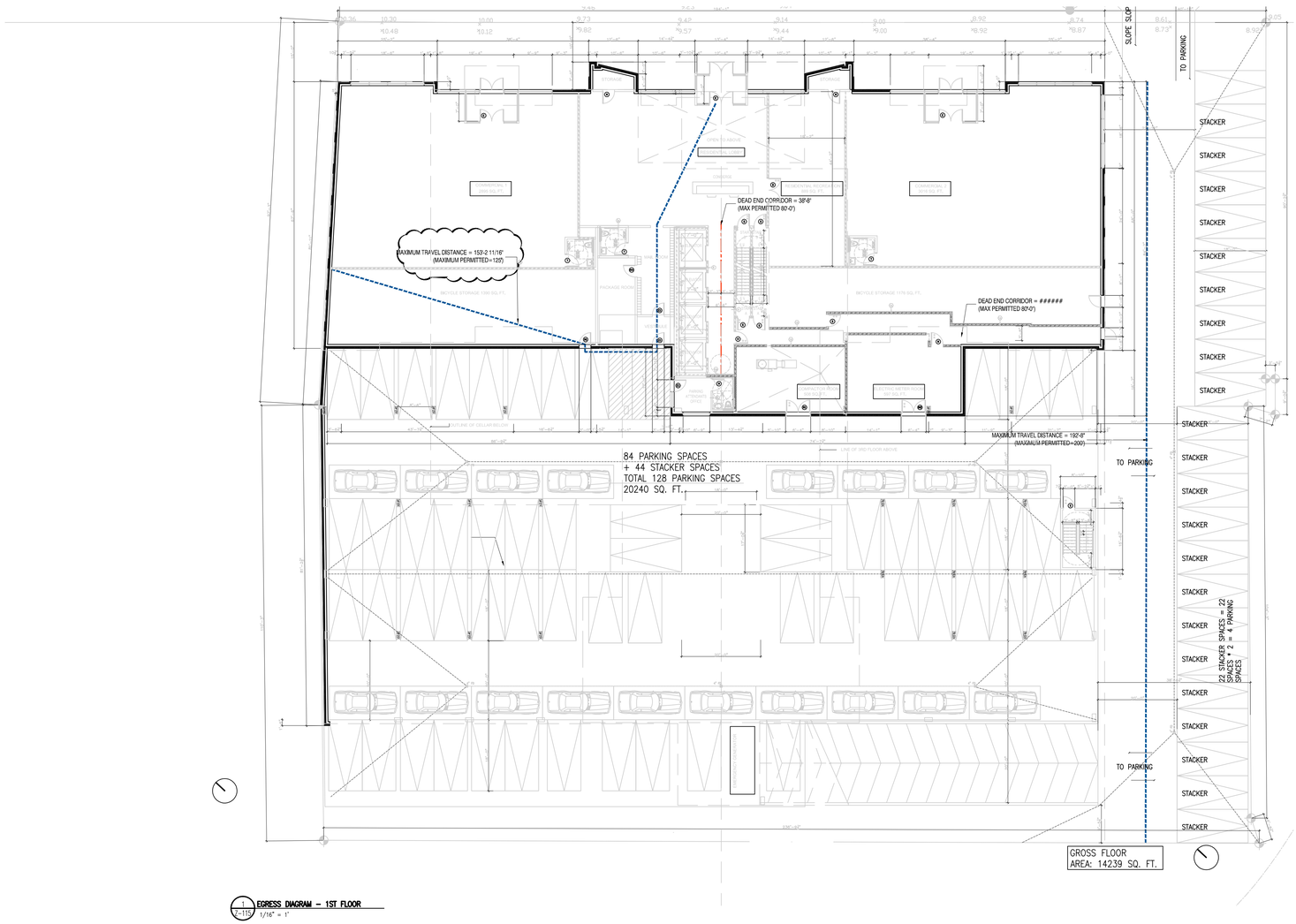


project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ZONING ANALYSIS
EGRESS DIAGRAM

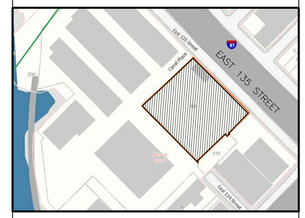
dob no

scale: AS INDICATED	project no.: 15–23
date: 2015–07–09	sheet no.: 10 OF
drawn: VV	drawing no.: Z-114.00
checked: KF	



1 / Z-115 EGRESS DIAGRAM – 1ST FLOOR
1/16" = 1'

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
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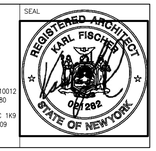

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ZONING ANALYSIS
EGRESS DIAGRAM

dob no

scale: AS INDICATED	project no.: 15-23
date: 2015-07-09	sheet no.: 10OF
drawn: VV	drawing no.: Z-115.00
checked: KF	

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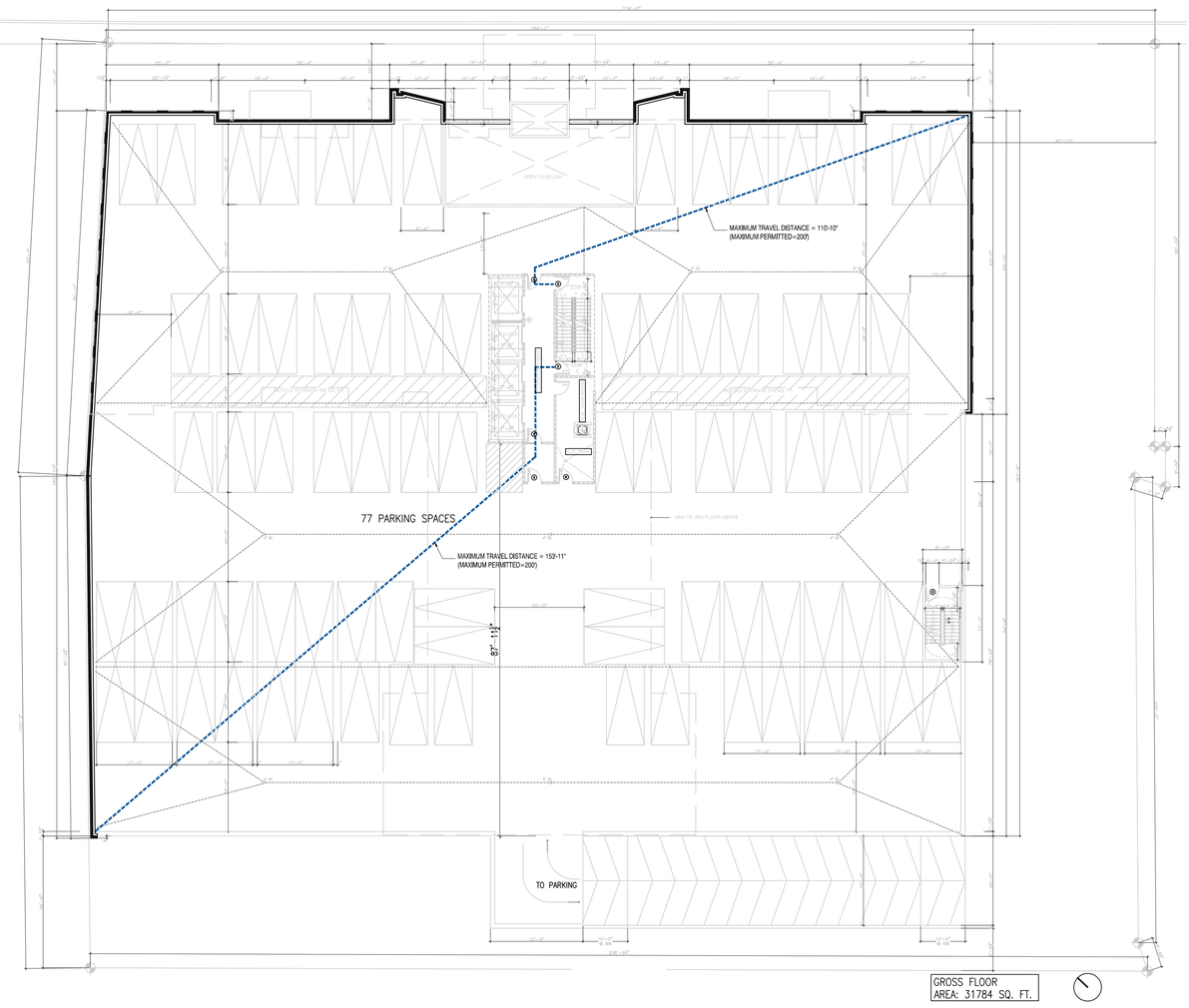
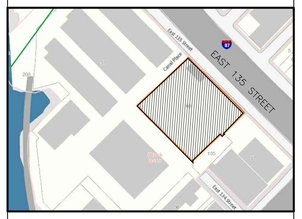
EAST 135TH STREET



EGRESS DIAGRAM - 2ND FLOOR
1/16" = 1'

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
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SEAL

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project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ZONING ANALYSIS
EGRESS DIAGRAM

dob no

scale: AS INDICATED	project no.: 15-23
date: 2015-07-09	sheet no.: 10 OF
drawn: VV	drawing no.: Z-116.00
checked: KF	

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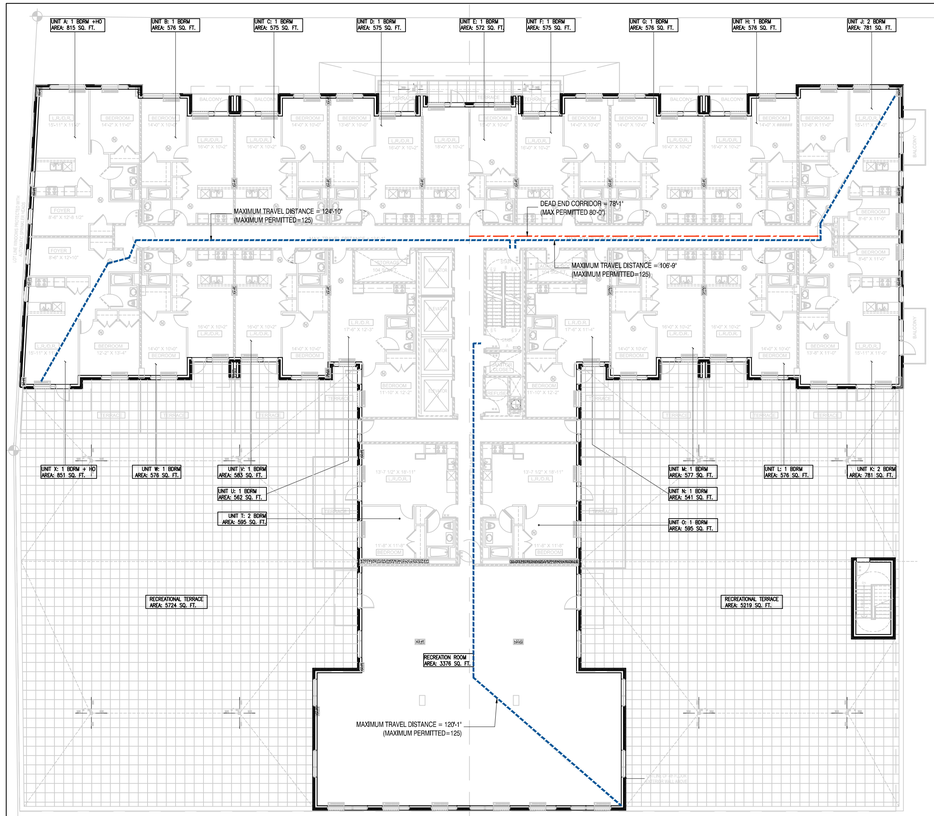
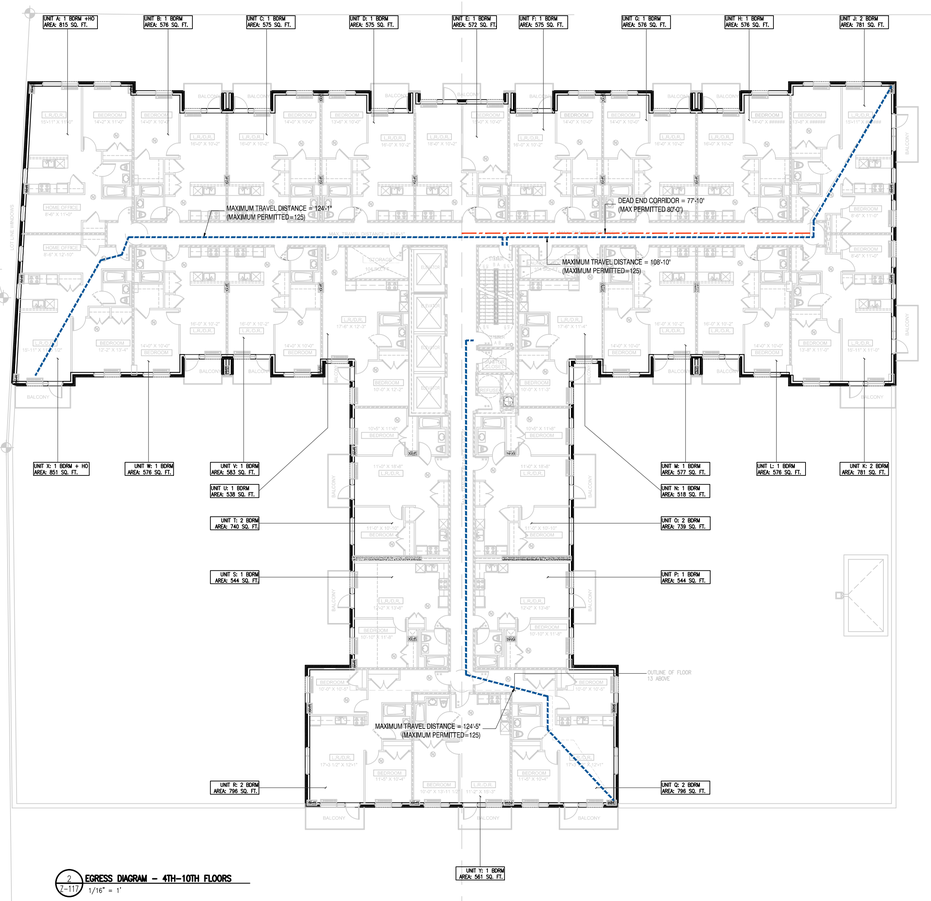


1 Z-117 EGRESS DIAGRAM- 3RD FLOOR
1/16" = 1'

GROSS FLOOR
AREA: 17702 SQ. FT.



2 Z-117 EGRESS DIAGRAM - 4TH-10TH FLOORS
1/16" = 1'

GROSS FLOOR

KEY PLAN

BLOCK: 2319 LOT: 60

issue	rev	date	description
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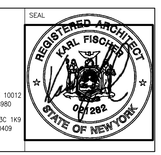

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ZONING ANALYSIS
EGRESS DIAGRAM

dob no

scale: AS INDICATED	project no.: 15-23
date: 2015-07-09	sheet no.: 10 OF
drawn: VV	drawing no.: Z-117.00
checked: KF	

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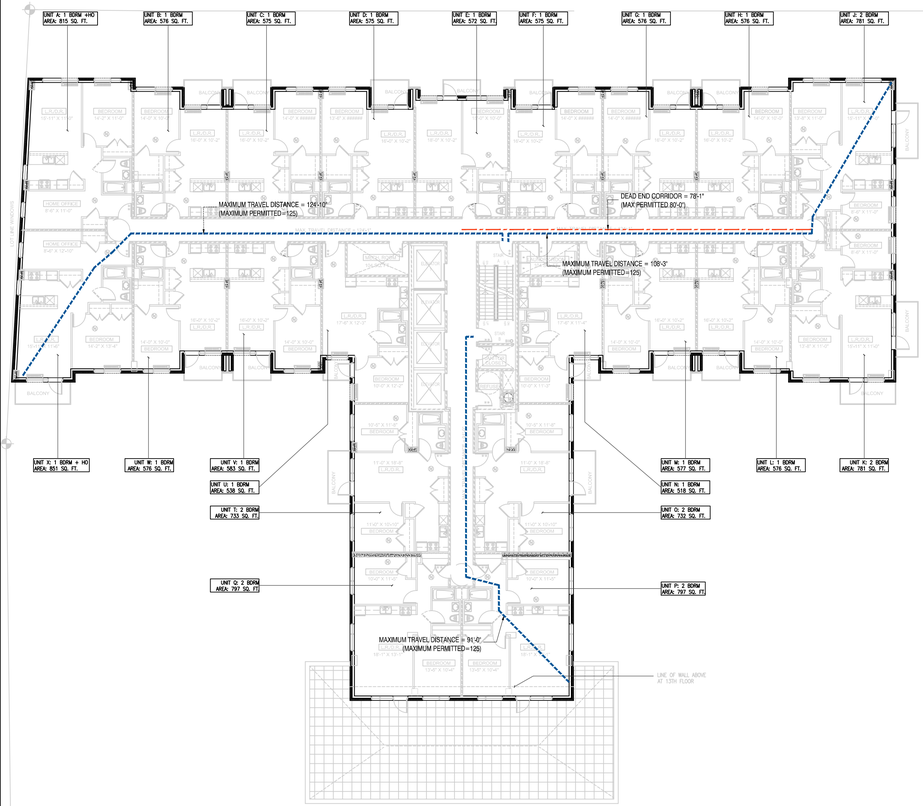
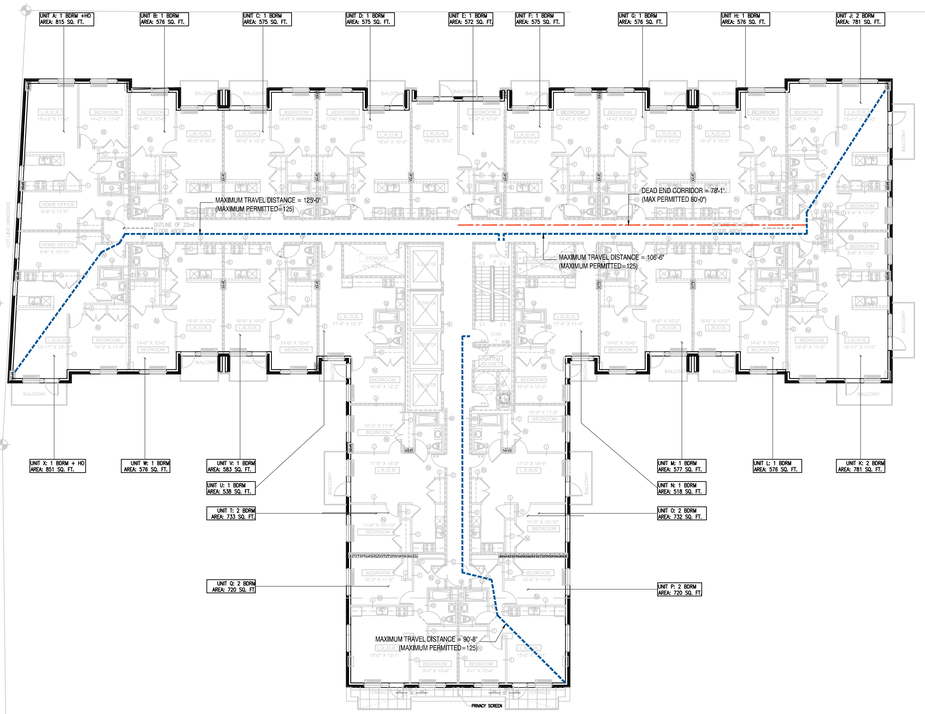


1 Z-118 EGRESS DIAGRAM – 11TH FLOOR
1/16" = 1'

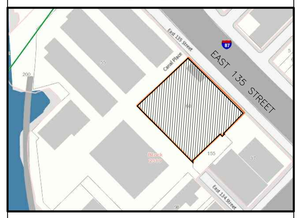
GROSS FLOOR



2 Z-118 EGRESS DIAGRAM – 12TH– 21ST FLOOR
1/16" = 1'

GROSS FLOOR

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

ISSUES/REVISIONS

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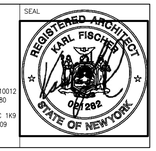

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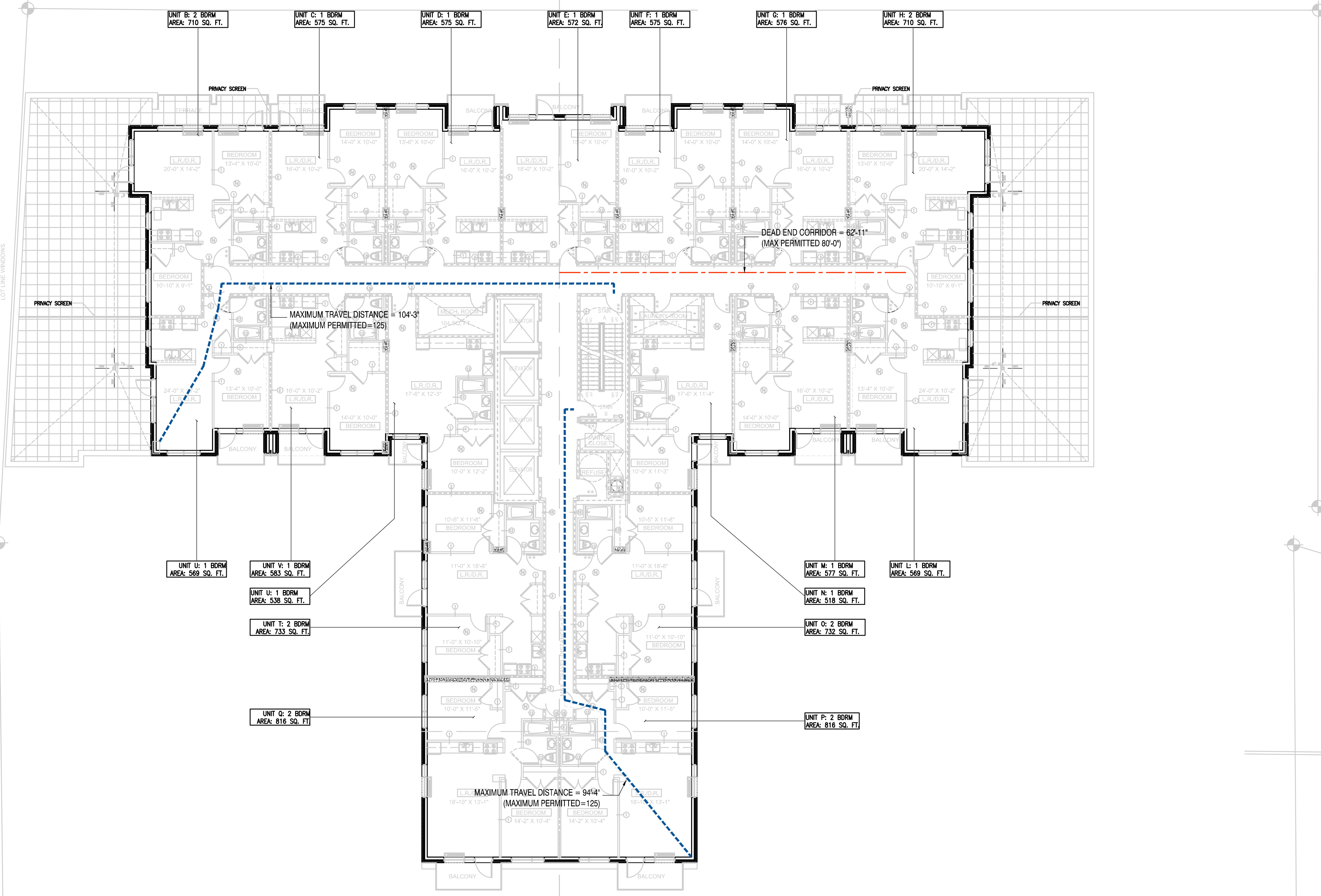
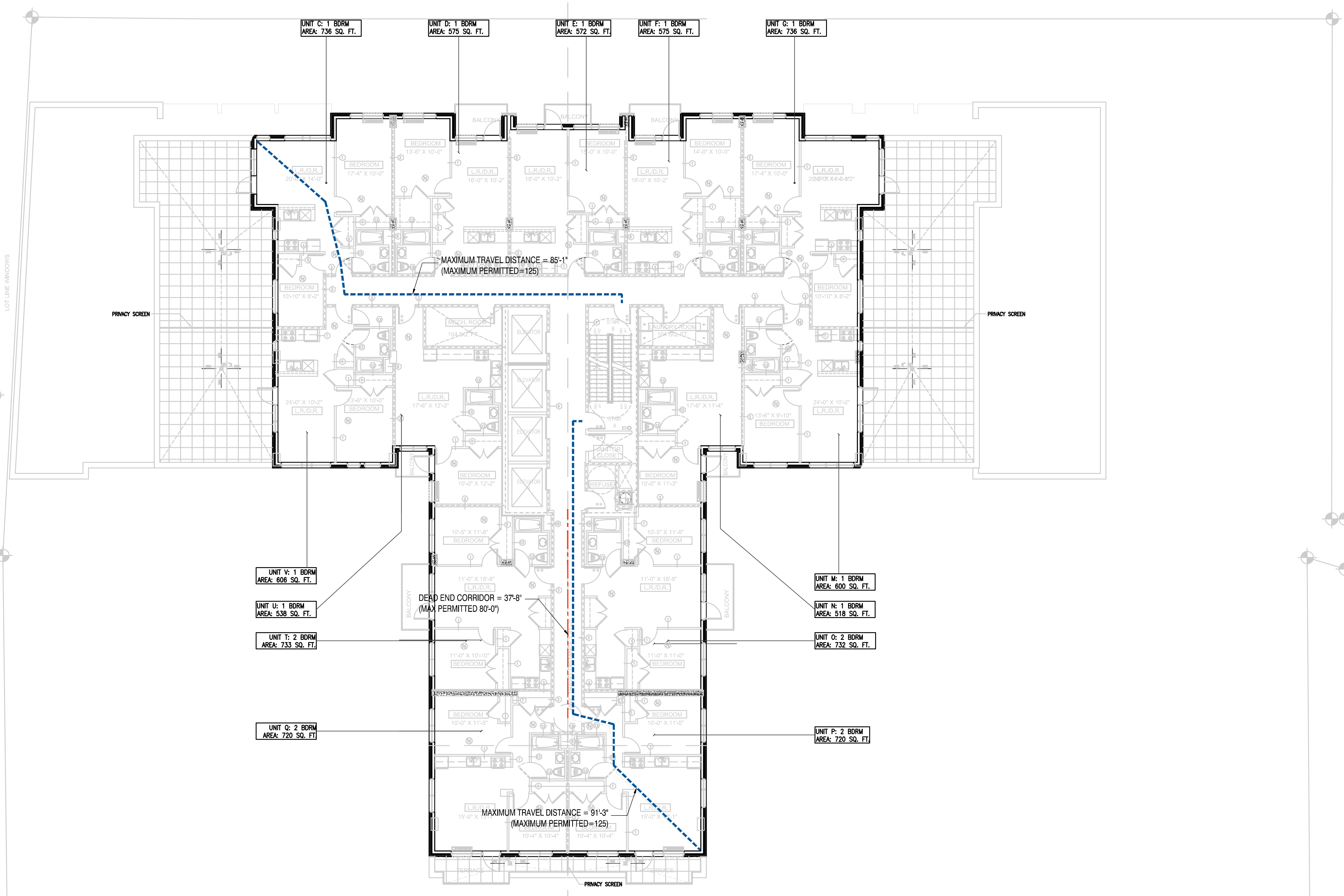


1 Z-119 **EGRESS DIAGRAM – 22TH FLOOR**
1/16" = 1'

GROSS FLOOR
AREA: 12807 SQ. FT.



2 Z-119 **EGRESS DIAGRAM – 23RD FLOOR**
1/16" = 1'

GROSS FLOOR
AREA: 10193 SQ. FT.

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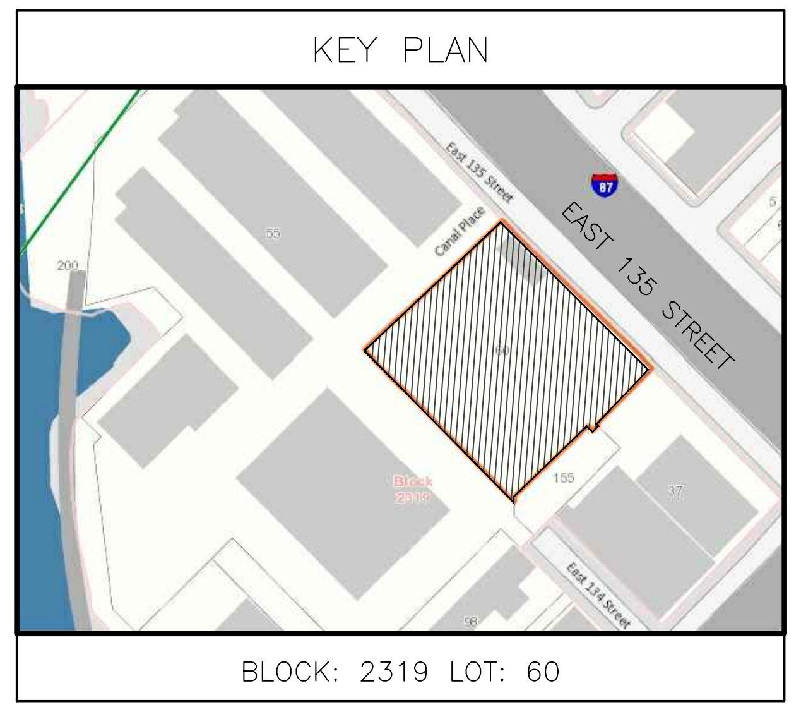
KEY PLAN



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021282

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200 EAST 135TH ST. BRONX, NEW YORK

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ZONING ANALYSIS
EGRESS DIAGRAM

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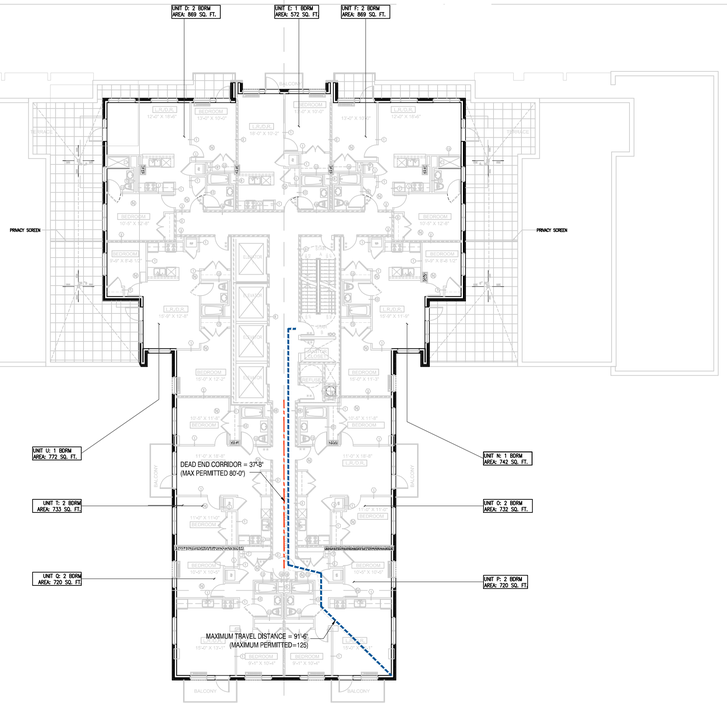
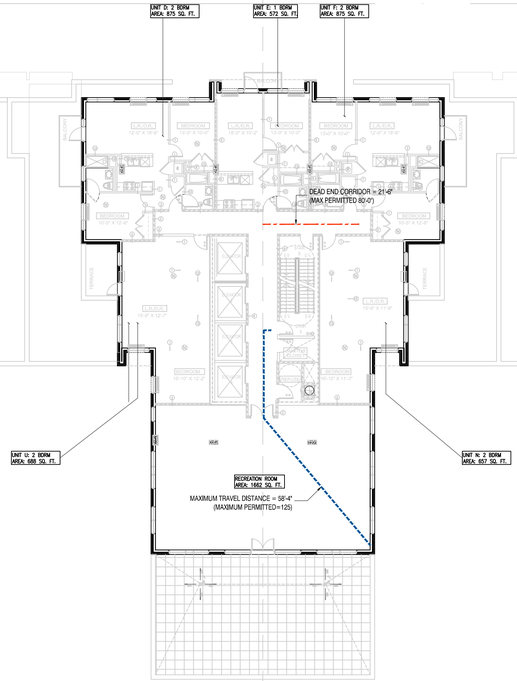


1 Z-120 EGRESS DIAGRAM – 24TH FLOOR
1/16" = 1'

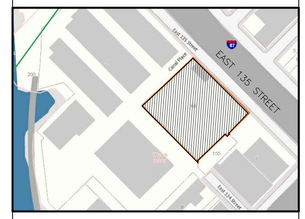
GROSS FLOOR



2 Z-120 EGRESS DIAGRAM – 25TH FLOOR
1/16" = 1'

GROSS FLOOR

KEY PLAN



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SEAL

REGISTERED ARCHITECT KARL FISCHER 091292 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ZONING ANALYSIS
EGRESS DIAGRAM

dob no

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GENERAL NOTES:

1. THE PROPOSED WORK ON THESE DRAWINGS SHALL COMPLY WITH NEW YORK CITY BUILDING CODE REQUIREMENTS, INCLUDING LOCAL LAW #17/95 (EARTHQUAKE CODE).
2. THE GENERAL CONTRACTOR SHALL OBTAIN CONSTRUCTION PERMIT AND PAY ALL REQUIRED FEES TO THE D.O.B. BASED ON THE PROPOSED WORK OF THIS DRAWING FROM NEW YORK CITY BUILDING DEPARTMENT PRIOR TO START OF WORK.
3. ALL ELECTRICAL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH THE NEW YORK CITY ELECTRICAL CODE. HE SHALL BE RESPONSIBLE FOR SCHEDULING ALL REQUIRED INSPECTIONS AND OBTAINING ALL REQUIRED ELECTRICAL SIGN-OFFS AND CERTIFICATES OF COMPLETION FROM THE DEPARTMENT OF BUILDING'S ELECTRICAL DIVISION.
4. ALL PLUMBING WORK SHALL BE PERFORMED BY A LICENSED PLUMBER IN ACCORDANCE WITH THE NEW YORK CITY PLUMBING CODE. HE SHALL BE RESPONSIBLE FOR SCHEDULING ALL REQUIRED INSPECTIONS AND OBTAINING ALL REQUIRED PLUMBING SIGN-OFFS AND CERTIFICATES OF COMPLETION FROM THE DEPARTMENT OF BUILDING'S PLUMBING DIVISION.
5. THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL CONDITIONS AND DIMENSIONS ON THE SITE PRIOR TO START OF WORK. HE SHALL NOTIFY THE ARCHITECT/ENGINEER OF RECORD OF ANY DISCREPANCIES AND/OR CHANGE OF LAYOUT BETWEEN THE FIELD CONDITIONS AND THESE DRAWINGS IMMEDIATELY. FAILURE TO DO SO WILL INDICATE THE GENERAL CONTRACTOR'S ACCEPTANCE OF THESE DRAWINGS AND WILLINGNESS TO TAKE FULL RESPONSIBILITY FOR SAID WORK BEING PERFORMED.
6. THE ARCHITECT/ENGINEER OF RECORD HAS NOT BEEN RETAINED TO SUPERVISE THE CONSTRUCTION.
7. THE GENERAL CONTRACTOR SHALL RETAIN THE SERVICES OF A LICENSED ARCHITECT/ENGINEER FOR ALL REQUIRED SPECIAL INSPECTIONS.
8. THE GENERAL CONTRACTOR SHALL OBTAIN SIGN-OFF FROM THE DEPARTMENT OF BUILDINGS AFTER COMPLETION OF WORK.
9. THE CONTRACTOR SHALL VISIT THE SITE AND SHALL BE KNOWLEDGEABLE OF CONDITIONS THEREON. HE SHALL INVESTIGATE, VERIFY AND BE RESPONSIBLE FOR ALL CONDITIONS OF THE PROJECT AND SHALL NOTIFY THE OWNER OF ANY CONDITIONS REQUIRING MODIFICATIONS BEFORE PROCEEDING WITH THE WORK.
10. REFER TO STRUCTURAL, MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR ADDITIONAL GENERAL NOTES, ABBREVIATIONS AND SYMBOLS. ALL NOTES ARE TO BE REVISED AND APPLIED TO RELATED BUILDING COMPONENTS.
11. NOTES APPEAR ON VARIOUS SHEETS FOR DIFFERENT SYSTEMS AND MATERIALS. SHEETS TO BE REVIEWED AND NOTES ON ANY ONE SHEET TO BE APPLIED ON RELATED DRAWINGS AND DETAILS.
12. DETAILS NOT SHOWN ARE SIMILAR IN CHARACTER TO THOSE DETAILED. WHERE SPECIFIED DIMENSIONS, DETAILS OR DESIGN INTENT CANNOT BE DETERMINED, CONSULT THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.
13. ALL ELEVATOR OPENINGS SHALL BE CERTIFIED BY THE ELEVATOR SUBCONTRACTOR PRIOR TO FORMING. REQUIRED MODIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT FOR APPROVAL PRIOR TO FORMING.
14. REFER TO CERTIFIED MECHANICAL AND ELECTRICAL CONTRACTORS DRAWINGS AND MANUFACTURER'S TEMPLATE DRAWINGS FOR ALL MECHANICAL AND ELECTRICAL EQUIPMENT SUPPORTS, BOLT SETTING TEMPLATES, ISOLATIONS, SPRING ISOLATION, ETC., NOT SHOWN ON THE DRAWINGS.
15. CONTRACTOR TO COORDINATE ALL EQUIPMENT BASE AND HOUSEKEEPING PADS WITH MECHANICAL, PLUMBING AND ELECTRICAL CONTRACTORS. EQUIPMENT BASES AND HOUSEKEEPING PADS TO BE A MINIMUM OF 4" HIGH UNLESS OTHERWISE NOTED.
16. CONCRETE PADS AND MOUNTINGS IN MECHANICAL SPACES SHALL BE COORDINATED WITH ELECTRICAL AND PLUMBING CONTRACTORS.
17. CONTRACTOR TO COORDINATE ALL MECHANICAL AND ELECTRICAL FLOOR AND WALL SLEEVES AND ALL MECHANICAL SHAFTS WITH MECHANICAL, PLUMBING, FIRE-PROTECTION, ELECTRICAL, STRUCTURAL AND ARCHITECTURAL DRAWINGS.
18. PROVIDE ACCESS PANELS AS APPLICABLE AND AS REQUIRED FOR MECHANICAL EQUIPMENT. ALL ACCESS PANELS SHALL BE CONCEALED, AND LOCATIONS SHALL BE REVIEWED WITH THE ARCHITECT PRIOR TO PROCEEDING.
19. PORTABLE FIRE EXTINGUISHERS LOCATED ON THE DRAWINGS SHALL RECEIVE APPROVAL OF FIRE DEPARTMENT PRIOR TO INSTALLATION. (N/A)
20. ALL SPRINKLER HEADS IN ACOUSTICAL TILE SHALL BE INSTALLED CENTERED IN THE ACOUSTICAL TILE.
21. ALL EXTERIOR HANDRAILS AND EXTERIOR EXPOSED METAL SHALL BE GALVANIZED AND PAINTED UNLESS NOTED OTHERWISE.
22. ALL EXTERIOR DOORS SHALL PREVENT AIR LEAKAGE/INFILTRATION AROUND THEIR PERIMETER WHEN IN A CLOSED POSITION.
23. ALL EXTERIOR JOINTS AROUND WINDOW AND DOOR FRAMES, BETWEEN WALLS AND FOUNDATIONS, BETWEEN WALLS AND ROOFS, AND BETWEEN WALLS AND PANELS AT PENETRATION OF UTILITIES THROUGH THE ENVELOPE SHALL BE SEALED, CAULKED OR WEATHER STRIPPED TO PREVENT AIR LEAKAGE/INFILTRATION.
24. ALL EXTERIOR SOFFITS SHALL BE CONSTRUCTED WITH RIGID GALVANIZED METAL FRAME MEMBERS AND SHALL RESIST UPLIFTING WIND LOADS OF 1.5 TIMES THE WIND PRESSURE DIAGRAM.
25. ALL EXTERIOR SOFFITS SHALL BE INSTALLED TO PROVIDE A 'U' VALUE OF 0.09, SHALL HAVE A VAPOR BARRIER AND SHALL BE PROPERLY SEALED AGAINST AIR INFILTRATION.
26. ALL DISSIMILAR METALS SHALL BE EFFECTIVELY ISOLATED FROM EACH OTHER TO AVOID MOLECULAR BREAKDOWN.
27. FUTURE TENANT DEVELOPMENT TO BE COVERED UNDER SEPARATE PERMITS.
28. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL CONDITIONS AND MATERIALS WITHIN THE PROPOSED CONSTRUCTION AREA. THE CONTRACTOR SHALL DESIGN AND INSTALL ADEQUATE SHORING AND BRACING FOR ALL STRUCTURAL AND REMOVAL TASKS. THE CONTRACTOR SHALL HAVE SOLE RESPONSIBILITY FOR ANY DAMAGE OR INJURIES CAUSED BY OR DURING THE EXECUTION OF WORK.
29. THE CONTRACTOR SHALL REPLACE AND REPAIR MISSING OR BROKEN SIDEWALK, CURB, OR ROADWAY DAMAGED DURING CONSTRUCTION AS DIRECTED BY THE NYC DEPARTMENT OF BUILDINGS, NYC DEPARTMENT OF TRANSPORTATION, OR OTHER AGENCIES.

DIMENSIONING:

1. ALL WALLS ARE ORTHOGONAL TO THE PROPERTY LINES UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL BE KNOWLEDGEABLE OF WHICH PROPERTY LINE DETERMINES THE ORIENTATION OF EACH WALL, AND SHALL NOTIFY THE ARCHITECT OF ANY CONDITIONS REQUIRING CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
2. PARTITIONS ARE DIMENSIONED TO THE FURNISHED FACE OF THE WALL UNLESS OTHERWISE NOTED.
3. ALL DIMENSIONS SHALL HAVE PREFERENCE OVER SCALE.
4. ALL DIMENSIONS SHALL BE VERIFIED IN THE FIELD BEFORE PROCEEDING WITH THE WORK. THE ARCHITECT SHALL BE NOTIFIED OF ANY CORRECTIONS.
5. DOOR OPENINGS ARE GENERALLY DIMENSIONED TO CENTERLINE OF OPENING. DOOR OPENINGS THAT ARE NOT DIMENSIONALLY LOCATED ARE TO BE CENTERED BETWEEN WALLS OR POSITIONED WITH ONE JAMB AGAINST AND ADJACENT WALL OR COLUMN AS SHOWN ON THE PLANS AND/OR DETERMINED FROM THE DETAILS.
6. WHEN UNDIMENSIONED PARTITIONS APPEAR IN CONJUNCTION WITH DOOR OPENINGS, THE DOOR WIDTH AND DOOR FRAME DETAILS DETERMINE THE LOCATION OF THE ADJACENT WALLS AND FRAMES.

PARTITION NOTES:

1. DEFLECTION FOR ALL PARTITIONS SHALL NOT EXCEED 1/240TH OF THE SPAN MAXIMUM FOR TYPICAL GYPSUM PARTITIONS, OR 1/360 FOR WOOD-CLAD PARTITIONS, OR STONE-CLAD PARTITION SYSTEMS.
2. WATER RESISTANT DRYWALL (FOR THE FULL HEIGHT OF THE PARTITION CONSTRUCTION) SHALL BE USED IN TOILETS, SHOWERS, SERVICE ROOMS, ETC. USE STANDARD GYPSUM BOARD FOR CEILING CONSTRUCTION.
3. PENETRATIONS: COORDINATE WITH MECHANICAL CONTRACTOR FOR OPENINGS REQUIRED FOR RETURN AIR IN FULL HEIGHT PARTITIONS.
4. PROVIDE LATERAL BRACING TO STRUCTURE ABOVE FINISHED CEILINGS FOR PARTITIONS EXCEEDING UNSUPPORTED HEIGHTS INDICATED ON DRAWINGS.
5. PROVIDE HORIZONTAL CONTROL JOINTS AT 12'-0" O.C. IN THE VERTICAL DIRECTION UNLESS NOTED OTHERWISE.
6. PROVIDE CONTROL JOINTS IN GYPSUM WALLBOARD CONSTRUCTION SUCH THAT PARTITION OR FURRING RUNS DO NOT EXCEED 30', AND CEILING DIMENSIONS DO NOT EXCEED 50' IN EITHER DIRECTION WITH PERIMETER RELIEF OR 30' WITHOUT PERIMETER RELIEF.
7. PROVIDE VERTICAL CONTROL JOINTS WITH SEALANT IN MASONRY WALLS AS SHOWN IN DRAWINGS WITH MAXIMUM SPACING OF 25'-0'.
8. COMPLETELY SEAL WITH ACOUSTICAL SEALANT HEADS, BASES, AND ENDS, PLUS ALL PENETRATIONS (INCLUDING BUT NOT LIMITED TO MECHANICAL, ELECTRICAL, AND PLUMBING WORK).
9. PROVIDE SOUND BLANKETS AS INDICATED.

SEISMIC/EARTHQUAKE CODE NOTES (NYC BUILDING CODE CHAPTER 16 STRUCTURAL DESIGN):

1. EARTHQUAKE LOADS - EVERY BUILDING, STRUCTURE AND PORTION THEREOF SHALL, AT A MINIMUM BE DESIGNED AND CONSTRUCTED TO RESIST THE EFFECTS OF SEISMIC GROUND MOTIONS.
2. NEW CONCRETE BLOCK WALLS TO HAVE STANDARD LADDER TYPE HORIZONTAL REINFORCEMENT AT 16 INCHES ON CENTER VERTICALLY.
3. PROVIDE BOND BEAM WITH TWO #6 REBARS AT TOP OF EACH FLOOR.
4. NEW CONSTRUCTION HAS BEEN DESIGNED IN COMPLIANCE WITH SEISMIC CODE LOCAL LAW 10/95 RULES AND REGULATIONS.
5. THESE PLANS COMPLY WITH THE SEISMIC CODE REQUIREMENTS OF LOCAL LAW17/95 RULES AND REGULATIONS.

WIND LOADS NOTES (NYC BUILDING CODE CHAPTER 16 STRUCTURAL DESIGN, SECTION BC 1609):

1. WIND LOADS - THE STRUCTURAL FRAME AND EXTERIOR COMPONENTS OF ALL BUILDINGS, SIGNS, TANKS AND OTHER EXPOSED CONSTRUCTION SHALL BE DESIGNED TO RESIST MINIMUM PRESSURES DUE TO WIND. WIND SHALL BE ASSUMED TO ACT FROM ANY HORIZONTAL DIRECTION. FOR CONTINUOUS FRAMING, THE EFFECTS OF PARTIAL LOADING CONDITIONS SHALL BE CONSIDERED.

OCCUPANT LOAD AND EXIT CAPACITY CALCULATON

FLOOR	OCCUPANT	FLOOR AREA PER OCCUPANT	FLOOR AREA PER OCC. (SQ. FT.)	TOTAL OCC. LOAD PER FLOOR	EXT. CAPACITY (IN INCHES) DOORS (MIN 36") (BC 1008.1.1 1) 0.2" PER OCC.		STAIRS (MIN 36") (BC 1009.1) 0.3" PER OCC.	
					REQUIRED	PROVIDED	REQUIRED	PROVIDED
CELLAR	R-2 RESIDENTIAL	1294	200	6.47	1.29	64"	1.94	64"
	S-1/S-2 (STORAGE / MECH)	7003	300	23.34	4.67		7.00	
1ST	R-2 RESIDENTIAL	3116	200	15.58	3.12	72"	4.67	N/A
	S-1/S-2 (STORAGE / MECH)	91.36	300	0.30	0.06		0.09	
	S-1/S-2 (STORAGE / MECH)	3356	300	11.19	2.24	220.5"	3.36	N/A
	S-2 PARKING	29608	200	148.04	29.61		44.41	N/A
	M COMMERCIAL	5595	30	186.50	37.30	140"	55.95	N/A
2ND	S-1/S-2 (STORAGE / MECH)	1205	300	4.02	0.80	388"	1.21	148"
	S-2 PARKING	31173	200	155.87	31.17		46.76	
3RD	R-2 RESIDENTIAL	16503	200	82.52	16.50	148"	24.75	148"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
4TH	R-2 RESIDENTIAL	14741	200	73.71	14.74	72"	22.11	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
5TH	R-2 RESIDENTIAL	14741	200	73.71	14.74	72"	22.11	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
6TH	R-2 RESIDENTIAL	14741	200	73.71	14.74	72"	22.11	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
7TH	R-2 RESIDENTIAL	14741	200	73.71	14.74	72"	22.11	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
8TH	R-2 RESIDENTIAL	14741	200	73.71	14.74	72"	22.11	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
9TH	R-2 RESIDENTIAL	14741	200	73.71	14.74	72"	22.11	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
10TH	R-2 RESIDENTIAL	14741	200	73.71	14.74	72"	22.11	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
11TH	R-2 RESIDENTIAL	14741	200	73.71	14.74	72"	22.11	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
12TH	R-2 RESIDENTIAL	14741	200	73.71	14.74	72"	22.11	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
13TH	R-2 RESIDENTIAL	13011	200	65.06	13.01	72"	19.52	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
14TH	R-2 RESIDENTIAL	13011	200	65.06	13.01	72"	19.52	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
15TH	R-2 RESIDENTIAL	13011	200	65.06	13.01	72"	19.52	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
16TH	R-2 RESIDENTIAL	13011	200	65.06	13.01	72"	19.52	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
17TH	R-2 RESIDENTIAL	13011	200	65.06	13.01	72"	19.52	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
18TH	R-2 RESIDENTIAL	13011	200	65.06	13.01	72"	19.52	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
19TH	R-2 RESIDENTIAL	13011	200	65.06	13.01	72"	19.52	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
20TH	R-2 RESIDENTIAL	13011	200	65.06	13.01	72"	19.52	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
21TH	R-2 RESIDENTIAL	13011	200	65.06	13.01	72"	19.52	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
22TH	R-2 RESIDENTIAL	10132	200	50.66	10.13	72"	15.20	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
23TH	R-2 RESIDENTIAL	8136	200	40.68	8.14	72"	12.20	72"
	S-1/S-2 (STORAGE / MECH)	177.5	300	0.59	0.12		0.18	
24TH	R-2 RESIDENTIAL	6300	200	31.50	6.30	72"	9.45	72"
	S-1/S-2 (STORAGE / MECH)	129.08	300	0.43	0.09		0.13	
25TH	R-2 RESIDENTIAL	4935	200	24.68	4.94	72"	7.40	72"
	S-1/S-2 (STORAGE / MECH)	129.08	300	0.43	0.09		0.13	

OCCUPANCY FIRE-RESISTANCE RATINGS:

1. CONSTRUCTION: TYPE IB NON-COMBUSTIBLE CONSTRUCTION - SPRINKLERED.
2. UNLESS NOTED OTHERWISE ALL COLUMNS, BEAMS AND OTHER STRUCTURAL MEMBERS SHALL HAVE SPRAYED ON FIREPROOFING INSTALLED AT THE REQUIRED THICKNESS AND DENSITY TO ACHIEVE THE THE HOURLY RATINGS AS SET FORTH HEREAFTER. ALL SPRAYED-ON FIREPROOFING SHALL COMPLY WITH SECTION BC 720: TABLE 720.1 AND ALL INSPECTION REQUIREMENTS OF THE BUILDING CODE OF NEW YORK CITY.
3. ALL RATED PARTITIONS SHALL RUN PAST STRUCTURAL BEAMS, TO THE UNDERSIDE OF STRUCTURAL SLAB, WHERE THE PARTITIONS TERMINATE TO THE UNDERSIDE OF STRUCTURAL BEAMS, THE STRUCTURAL BEAMS SHALL HAVE ADDITIONAL SPRAYED-ON FIREPROOFING TO ACHIEVE AN AREA SEPARATION RATING EQUAL TO THAT OF THE PARTITION RATING, IF REQUIRED.
4. SPACE BETWEEN SLAB AND EXTERIOR WALL AND ALL OPENINGS IN THE FLOOR SLABS INCLUDING SPACES BETWEEN DUCTS, CONDUIT, PIPING, ETC., (EXCEPT WHEN COMPLETELY ENCLOSED BY FIRE RATED CONSTRUCTION), SHALL BE SAFED-OFF (FILLED) WITH APPROVED SAFING MATERIAL TO MAINTAIN FIRE RATING CONTINUITY OF THE FLOOR CONSTRUCTION. ALL JOINTS OF ANY ELEMENT OF CONSTRUCTION SHALL BE TIGHT AND PREVENT THE PASSAGE OF SMOKE OR FLAME.
5. WHERE MASONRY WALLS AT INTERIOR LOT LINES ARE BROKEN TO ACCOMMODATE STRUCTURE THEREBY REDUCING THE FIRE RATING OF THE WALL AT THE STRUCTURE, THEN THE STRUCTURE SHALL BE FIREPROOFED AT THE REQUIRED WALL RATING.
6. ALL FIRE RESISTIVE (LABELED) FIRE DOORS SHALL HAVE THE APPROPRIATE LABELS AFFIXED TO BOTH DOOR AND FRAME.
7. A FINISH OR FIRE RATING INDICATION ON A WALL SHALL MEAN THE ENTIRE LENGTH OF WALL IS TO BE FINISHED OR FIRE RATED AS INDICATED.
8. ALL PIPING, DUCTS, ETC., THAT PENETRATE FLOOR SLABS SHALL BE INSTALLED IN A MANNER THAT WILL PRESERVE THE FIRE RESISTIVE AND STRUCTURAL INTEGRITY OF THE BUILDING.
9. WHERE INTERIOR FINISH MATERIALS ARE SPACED (FURRED) FROM THEIR SUPPORTING MEMBERS, THE CONCEALED SPACES CREATED SHALL BE FIRE STOPPED AS REQUIRED BY CODE.
10. ALL RATINGS SHALL COMPLY WITH NEW YORK CITY BUILDING CODE CHAPTER 7 FIRE-RESISTANCE-RATED CONSTRUCTION.
11. LINTELS OVER OPENINGS WIDER THAN 4 FEET IN MASONRY WALLS SHALL BE FIRE PROTECTED AS REQUIRED BY SECTION BC 714.2.
12. WHERE PIPES, WIRES, CONDUITS, DUCTS, ETC. PIERCE FIRE PROTECTION OF INDIVIDUALLY ENCASED, SUCH PENETRATION SHALL NOT EXCEED 2% OF ANY ONE FACE OF SUCH PROTECTION; AND SHALL BE CLOSED OFF WITH CLOSE-FITTING METAL ESCUTCHEONS OR PLATES AND CONCEALED SPACE SHALL BE FIRESTOPPED AT EACH STORY AS PER BC 704.8.
13. FIRE BARRIER WALLS SHALL COMPLY WITH PROVISIONS OF BC 706 AND SHALL EXTEND FROM THE TOP OF THE FLOOR/ CEILING ASSEMBLY BELOW TO THE UNDERSIDE OF THE FLOOR ABOVE. THESE WALLS SHALL BE CONTINUOUS THROUGH CONCEALED SPACES IN THE FLOOR AND ROOF CONSTRUCTION. HOLLOW VERTICAL SPACES WITHIN THE FIRE BARRIER WALL SHALL BE FIRESTOPPED AT EVERY FLOOR.
14. FLOOR AND ROOF ASSEMBLIES REQUIRED TO HAVE A FIRE-RESISTANCE RATING SHALL COMPLY WITH SECTION BC 712.
15. THROUGH PENETRATIONS AND MEMBRANE PENETRATIONS OF FIRE RATED CONSTUCTION SHALL COMPLY WITH THE REGULATIONS SET FORTH IN SECTION BC 713, IN ADDITION, DUCTS AND TRANSFER OPENINGS SHALL COMPLY WITH THE REGULATIONS SET FORTH IN SECTION BC 716 AND THE NEW YORK CITY MECHANICAL CODE. SHAFT ENCLOSURES SHALL COMPLY WITH THE REGULATIONS SET FORTH IN BC 707.
16. OPENINGS IN FIRE RATED CONSTUCTION TO COMPY WITH SECTION BC 715.
17. CONCEALED SPACES WITHIN PARTITIONS, WALLS, FLOORS, STAIR, FURRING, PIPE SPACES, COLUMN ENCLOSURES, ETC., SHALL BE FIRE STOPPED IN COMPLIANCE WITH REGULATIONS SET FORTH IN SECTION BC 717.
18. OCCUPANCY CLASSIFICATION: RESIDENTIAL GROUP R-2.
19. ALLOWABLE HEIGHT AND BUILDING AREAS LIMITATIONS TABLE 503 OF 2014 NYC BUILDING CODE.

TABLE 503
ALLOWABLE BUILDING HEIGHTS AND AREAS*
Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane.
Building area limitations shown in square feet, as determined by the definition of "Area, building," per story.

GROUP		TYPE OF CONSTRUCTION									
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V		
		A	B	A	B	A	B	HT	A	B	
	HEIGHT (feet) HEIGHT(S)	UL	160*	65	55	65	55	65	50	40	
A-1	S	UL	UL	6	3	6	3	6	3	2	
	A	UL	UL	17,500	10,500	14,700	5,600	15,000	8,400	5,500	
A-2	S	UL	UL	6	3	6	3	6	3	2	
	A	UL	UL	17,500	9,500	14,000	5,600	15,000	8,400	5,500	
A-3	S	UL	UL	6	3	6	3	6	3	2	
	A	UL	UL	17,500	9,500	14,000	5,600	15,000	8,400	5,500	
A-4	S	UL	UL	6	3	6	3	6	3	2	
	A	UL	UL	17,500	9,500	14,000	5,600	15,000	8,400	5,500	
A-5	S	UL	UL	UL	UL	UL	UL	6	UL	UL	
	A	UL	UL	UL	UL	UL	UL	UL	UL	UL	
B	S	UL	UL	6	3	6	3	6	3	2	
	A	UL	UL	37,500	10,500	28,500	5,600	36,000	8,400	5,500	
E	S	UL	UL	4	3	4	3	4	3	2	
	A	UL	UL	26,000	10,500	23,500	5,600	25,500	8,400	5,500	
F-1	S	UL	UL	6	3	6	3	6	3	2	
	A	UL	UL	37,500	10,500	28,500	5,600	30,000	8,400	5,500	
H-1	S	1	1	1	1	1	1	1	1	NP	
	A	21,000	16,500	11,000	7,500	9,500	7,000	10,500	7,500	NP	
H-2[d]	S	UL	3	2	1	2	1	2	1	1	
	A	21,000	16,500	11,000	7,500	9,500	7,000	10,500	7,500	3,000	
H-3[d]	S	UL	6	4	2	4	2	4	2	1	
	A	UL	60,000	26,500	14,000	17,500	13,000	25,000	10,000	5,000	
H-4	S	UL	UL	5	2	5	2	5	2	2	
	A	UL	UL	37,500	17,500	28,500	17,500	36,000	18,000	6,500	
H-5	S	3	3	3	3	3	3	3	3	2	
	A	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000	
I-1	S	UL	UL	6	NP	6	3	6	NP	NP	
	A	UL	UL	19,000	NP	16,500	5,600	18,000	NP	NP	
I-2	S	UL	6	4	3	5	3	5	3	NP	
	A	UL	UL	7,000	3,500	5,000	1,200	6,500	2,000	NP	
I-3	S	UL	4	4	3	4	2	4	3	NP	
	A	UL	UL	7,000	3,500	5,000	1,200	6,500	2,000	NP	
I-4	S	UL	UL	3	3	3	3	3	2	2	
	A	UL	UL	26,500	9,500	23,500	5,600	23,500	8,400	5,500	
M	S	UL	UL	6	3	6	3	6	3	2	
	A	UL	UL	21,500	7,500	18,500	5,600	14,000	8,400	5,500	
R-1	S	UL	UL	6	NP	6	NP	6	NP	NP	
	A	UL	UL	UL	NP	24,000	NP	20,500	NP	NP	
R-2	S	UL	UL	NP	6	NP	3	6	NP	NP	
	A	UL	UL	UL	NP	24,000	5,600	20,500	NP	NP	
R-3	S	UL	UL	6	3	6	3	6	3	3	
	A	UL	UL	17,500	10,500	14,700	5,600	30,000	8,400	5,500	
S-1	S	UL	6	5	3	4	3	4	3	2	
	A	48,000	12,000	7,500	7,500	7,500	7,500	7,500	5,000	1,000	
S-2[b,c]	S	UL	UL	6	3	6	4	6	3	2	
	A	UL	UL	15,000	10,000	10,000	8,500	10,000	8,400	5,500	
U[e]	S	UL	5	4	2	3	2	4	2	1	
	A	UL	35,000	19,000	8,500	14,000	8,500	18,000	9,000	5,500	

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m².
A = building area per story, S = stories above grade plane,
UL = Unlimited, NP = Not permitted.

= Not permitted in Fire District.
= Not permitted in Fire District without sprinklers.

a. See the following sections for general exceptions to Table 503:
Section 504.2, Allowable height increase due to automatic sprinkler system installation.
Section 505.2, Allowable area increase due to frontage.
Section 506.3, Allowable area increase due to automatic sprinkler system installation.
Section 507, Unlimited area building.
b. For open parking structures, see Section 406.3.
c. For private garages, see Section 406.1.
d. See Section 415.5 for limitations.
e. Except for Occupancy Groups F-1, H-1 through H-5, I-2, I-3, S-1 and U, buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 shall be unlimited in height.

20. REQUIRED SEPARATION OF OCCUPANCIES (HOURS)TABLE 508.4 OF 2014 NYC BUILDING CODE.

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

OCCUPANCY	A, E		I-1, I-2, I-4		I-2		R[a]		F-2, S-2[b], U		B		F-1		M		S-1		H-1		H-2		H-3, H-4		H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A, E	N	N	1	2	NP	1	2	N	1	1	1	2	1	2	1	2	1	2	NP	NP	3	4	2	3	2	NP
I-1, I-3, I-4	--	--	--	N	N	2	NP	1	NP	1	2	1	2	1	2	1	2	1	NP	NP	3	NP	2	NP	2	NP
I-2	--	--	--	--	N	N	2	NP	2	NP	2	NP	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP	2	NP
R[a]	--	--	--	--	--	N	N	1[c]	2[c]	1	2	1	2	1	3	2	NP	NP	NP	NP	3	NP	2	NP	2	NP
F-2, S-2[b], U	--	--	--	--	--	--	N	N	1	2	1	2	1	2	1	2	NP	NP	NP	NP	3	4	2	3	2	NP
B	--	--	--	--	--	--	--	--	N	N	2	3	1	2	2	3	NP	NP	NP	NP	2	3	1	2	1	NP
F-1	--	--	--	--	--	--	--	--	--	--	N	N	2	3	2	3	NP	NP	NP	NP	2	3	1	2	1	NP
M	--	--	--	--	--	--	--	--	--	--	--	--	N	N	2	3	NP	NP	NP	NP	2	3	1	2	1	NP
S-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N	N	NP	NP	NP	2	3	1	2	1	NP
H-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	NP	NP	NP	NP	NP	NP	NP	NP
H-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	N	N

EGRESS NOTES:

1. MEANS OF EGRESS ARE TO COMPLY WITH ALL APPLICABLE REQUIREMENTS OF BC 1003. THE MEANS OF EGRESS SHALL HAVE A MINIMUM CLEAR HEIGHT OF 7'-6" , EXCEPT OTHERWISE LISTED IN BC 1003.2. PROJECTION OBJECTS SHALL COMPLY WITH THE REQUIREMENTS OF BC 1003.3.1 THROUGH BC 1003.3.4.

2. DOORS, GATES, AND TURNSTILES ARE TO COMPLY WITH ALL APPLICABLE REQUIREMENTS OF BC 1008.

3. INTERIOR STAIRS ARE TO COMPLY WITH ALL APPLICABLE REQUIREMENTS OF BC 1009 INCLUDING THE FOLLOWING;

   3.1. THE CLEAR HEADROOM IS TO BE 7'-0" MINIMUM, EXCEPT FOR GROUP R-2 AND R-3 MINIMUM HEADROOM IS TO BE 6'-8" (BC 1009.2).
   3.2. WITHIN DWELLING UNITS IN GROUP R--2 OCCUPANCIES; WHERE THE NOSING OF TREADS AT THE SIDE OF FLIGHT EXTEND UNDER THE EDGE OF A FLOOR OPENING THROUGH WHICH THE STAIR PASSES, THE FLOOR OPENING SHALL BE ALLOWED TO PROJECT HORIZONTALLY INTO REQUIRED HEADROOM A MZIMUM OF 4 ¾" INCHES.
   3.3. LANDINGS AND PLATFORMS PROVIDED AT THE HEAD AND FOOT OF EACH FLIGHT OF STAIRS ARE TO HAVE A MINIMUM WIDTH, PERPENDICULAR TO THE DIRECTIONS OF TRAVEL, OF AT LEAST THE WIDTH OF THE STAIR. IN AN INTERMEDIATE LANDING IN STRAIGHT-RUN STAIRS, THE DISTANCE BETWEEN RISERS OF THE UPPER AND LOWER FLIGHTS NEED NOT BE MORE THAN 48" (BC 1009.5).
   3.4. THE MAXIMUM VERTICAL RISE OF A SINGLE FLIGHT OF STAIRS BETWEEN FLOORS IS NOT TO EXCEED 12' IN ALL OCCUPANCY GROUPS (BC 1009.7).
   3.5. FOR GROUP R2 AND R3, THE SUM OF TWO RISERS PLUS ONE TREAD EXCLUSIVE OF NOSING SHALL BE NOT LESS THAN 24" NOR MORE THAN 25 1/2" (BC 1009.4.2).
   3.6. HANDRAILS SHALL BE PROVIDED ON EACH SIDE (BC 1009.12 & 2407). HANDRAIL HEIGHT MEASURED ABOVE STAIR TREAD NOSINGS, OR FINISH SURFACE OF RAMP SLOPE, SHALL BE UNIFORM, NOT LESS THAN 34" AND NOT MORE THAN 38" (BC 1012.2). INTERMEDIATE HANDRAILS ARE REQUIRED SO THAT ALL PORTIONS OF THE STAIRWAY WIDTH REQUIRED FOR EGRESS CAPACITY ARE WITHIN 30" OF A HANDRAIL (BC 1012.9). HANDRAIL SHALL PROVIDE 1-1/2" CLEAR SPACE BETWEEN A HANDRAIL AND A WALL, OR OTHER SURFACE (BC 1012.7).

4. THE MEANS OF EGRESS ILLUMINATION LEVEL SHALL NOT BE LESS THAN 1 FOOT-CANDLE AT THE WALKING SURFACES (BC 1006.2).

5. AS PER BC 1006.3 IN EVENT OF POWER SUPPLY FAILURE, AN EMERGENCY ELECTRICAL SYSTEM SHALL AUTOMATICALLY ILLUMINATE EXIT ACCESS CORRIDORS, EXIT PASSAGEWAYS, AND EXIT STAIRWAYS IN BUILDINGS REQUIRED TO HAVE TWO OR MORE MEANS OF EGRESS AND OTHER COMPONENT LISTED UNDER THIS SECTION. THE INSTALLATION OF THE EMERGENCY POWER SYSTEM SHALL BE IN ACCORDANCE WITH CHAPTER 27.

6. EXITS SHALL BE MARKED BY APPROVED EXIT SIGN READILY VISIBLE FROM ANY DIRECTION OF EGRESS TRAVEL; ACCESS TO EXITS SHALL BE MARKED BY EXITS SIGNS IN CASES WHERE THE PATH OF EGRESS IS NOT IMMEDIATELY VISIBLE TO THE OCCUPANTS. EXIT SIGNS TO BE PROVIDED AS REQUIRED AND AS SPECIFIED IN BC 1011.

7. PROVIDE FLOOR NUMBERING SIGNS AS PER SECTION BC 1028

8. A TACTILE SIGN INDICATING EXIT AND COMPLYING WITH ICCA A 117.1 SHALL BE PROVIDED ADJACENT TO EACH DOOR TO AN EGRESS STAIR, AN EXIT PASSAGEWAY, AND THE EXIT DISCHARGE PER AS PER BC 1011.3.

9. ELEVATOR IDENTIFICATION AND EMERGENCY SIGNS SHALL BE PROVIDED IN ACCORDANCE WITH SECTION BC 3002.3.

10. ACCESSIBLE SPACES SHALL BE PROVIDED WITH NOT LESS THAN ONE ACCESSIBLE MEANS OF EGRESS; ACCESSIBLE MEANS OF EGRESS SHALL COMPLY WITH THE REQUIREMENTS OF SECTION BC 1007.

11. PENETRATIONS INTO AND OPENINGS THROUGH AN EXIT ENCLOSURE ARE PROHIBITED EXCEPT FOR REQUIRED EXIT DOORS, EQUIPMENT AND DUCTWORK NECESSARY FOR INDEPENDENT PRESSURIZATION, HYDRONIC PIPING AND RELATED HEATING EQUIPMENT LIMITED TO SERVING THE EXIT ENCLOSURE IN WHICH SUCH PIPING AND EQUIPMENT IS LOCATED, SPRINKLER PIPING, STANDPIPES, ELECTRICAL RACEWAY FOR FIRE DEPT. COMMUNICATION AND ELECTRICAL RACEWAY SERVING THE EXIT ENCLOSURE AND TERMINATING AT A STEEL BOX NOT EXCEEDING 16 SQUARE INCHES AS PER SECTION BC 1022.4.

12. ALL EXITS SHALL BE KEPT READILY ACCESSIBLE AND UNOBSTRUCTED AT ALL TIMES.

13. MAXIMUM TRAVEL DISTANCE SHALL COMPLY WITH BC 1016: TABLE 1016.1.

TABLE 1016.1
EXIT ACCESS TRAVEL DISTANCE[a]

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)	
A	See Section 1028.7		NYC
E, F-1, M, R, S-1	150	200[b]	NYC
B	200	300[c]	
F-2, S-2, U	200	250[b]	NYC
H-1	Not Permitted	75[c]	
H-2	Not Permitted	100[c]	
H-3	Not Permitted	150[c]	
H-4	Not Permitted	175[c]	
H-5	Not Permitted	200[c]	
I-1, I-2, I-3, I-4	Not Permitted	200c	NYC

For SI: 1 foot = 304.8 mm.

a. See the following sections for modifications to exit access travel distance requirements:
Section 402.4: For the distance limitation in malls.
Section 404.9: For the distance limitation through an atrium space.
Section 407.4: For the distance limitation in Group I-2.
Sections 408.6.1 and 408.8.1: For the distance limitations in Group I-3.
Section 411.4: For the distance limitation in special amusement buildings.
Sections 1014.2.2 through 1014.2.7: For the distance limitation in Group I-2 hospital suites.
Section 1015.4: For the distance limitation in refrigeration machinery rooms.
Section 1015.5: For the distance limitation in refrigerated rooms and spaces.
Section 1021.2: For buildings with one exit.
Section 1028.7: For increased limitation in assembly seating.
Section 1028.7: For increased limitation for assembly open-air seating.
Section 3103.4: For temporary structures.
Section 3104.9: For pedestrian walkways. NYC

b. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where sprinkler systems according to Section 903.3.1.2 are permitted. NYC

c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. NYC

14. MINIMUM NUMBER OF EXITS REQUIRED SHALL COMPLY WITH BC 1021: TABLE 1021.1

15. OCCUPANCY LOAD SHALL COMPLY WITH BC 1004: TABLE 1004.1.1.

16. EGRESS WIDTH PER OCCUPANT SHALL NOT BE LESS THAN THE TOTAL OCCUPANT LOAD SERVED BY THE MEANS OF EGRESS MULTIPLIED BY FACTORS IN BC 1005.1

17. ACCESSIBLE MEANS OF EGRESS, BC 1007
THE PROPOSED BUILDING HAS TWO MEANS OF EGRESS.
THE TWO MEANS OF ACCESSIBLE EGRESS ARE PROVIDED THROUGH EXIT STAIRWAYS.
BC 1007.3 EXIT STAIRWAYS:
EXCEPTIONS:
THE CLEAR WIDTH OF 48 IN. BETWEEN HANDRAIL & AREA OF RESCUE ASSISTANCE IS NOT REQUIRED AT EXIT ACCESS STAIRWAYS PERMITTED BY SECTION 1061.1 OR IN BUILDINGS EQUIPPED WITH AN AUTOMATIC SPRINKLER SYSTEM.

FINISHES AND DETAILS:

1. INTERIOR FINISHES SHALL LIMIT THE ALLOWABLE FLAME SPREAD AND SMOKE DEVELOPMENT BASED ON LOCATION AND OCCUPANCY CLASSIFICATION (BC 803.1).

2. INTERIOR WALL AND CEILING FINISHES SHALL BE CLASSIFIED IN ACCORDANCE WITH ASTM E84 OR UL 723 AND SHALL BE USED IN ACCORDANCE WITH BC 803, TABLE 803.1.

3. SMOKE DEVELOPED INDEX SHALL COMPLY WITH BC 803.1.1.3.

4. ATTACHMENTS AND ADHESIVES FOR INTERIOR FINISHES TO HAVE THE SAME FLAME-SPREAD AND SMOKE DEVELOPED RATING OF THE INTERIOR FINISHES.

5. NO MATERIAL SHALL BE USED IN ANY INTERIOR LOCATION WHICH WILL PRODUCE PRODUCTS MORE TOXIC THAN THOSE GIVEN OFF BY WOOD OR PAPER WHEN DECOMPOSING OR BURNING AS PER BC 803.5.

6. COMBUSTIBLE FLOORING MAY BE USED WHEN IN ACCORDANCE WITH BC 804.

7. ALL GLASS PANELS USED IN WINDOWS, IN DOORS, AS INTERIOR PARTITIONS, ETC., SHALL COMPLY WITH NEW YORK CITY BUILDING CODE CHAPTER 24 GLASS AND GLAZING.

8. EXCEPT FOR MISCELLANEOUS TRIMS, MOLDINGS, ETC., ALL WOOD USED SHALL BE FIRE-RETARDANT, I.E. COUNTER TOPS, CABINETS, DOORS, ETC.

9. ALL SURFACES TO BE PAINTED.

SMOKE DETECTING DEVICES:

1. SMOKE DETECTING DEVICES SHALL CONFORM TO NEW YORK CITY BUILDING CODE SECTION BC 907.2.9.2 AND THE FIRE WARNING EQUIPMENT FOR DWELLING UNITS PROVISIONS OF NFPA 72.

2. SMOKE ALARMS SHALL BE INSTALLED AND MAINTAINTAINED IN ALL THE FOLLOWING LOCATIONS: ON THE CEILING OR WALL OUTSIDE OF EACH ROOM USED FOR SLEEPING PURPOSES WITHIN 15 FEET OF THE DOOR TO SUCH ROOM; IN EACH ROOM USED FOR SLEEPING PURPOSES; OR IN EACH STORY OF A DWELLING UNIT.

3. REQUIRED SMOKE DETECTING DEVICES SHALL RECEIVE THEIR PRIMARY POWER FROM A DEDICATED BRANCH CIRCUIT OR THE UNSWITCHED PORTION OF A BRANCH CIRCUIT ALSO USED FOR POWER AND LIGHTING AND SHALL BE EQUIPPED WITH A BATTERY BACKUP AND INTERCONNECTED.

4. SMOKE ALARMS SHALL BE PROVIDED WITH THE CAPABILITY TO SUPPORT VISIBLE ALARM NOTIFICATION APPLIANCES IN ACCORDANCE WITH ICC/ANSI A117.1

5. ALL SMOKE DETECTING DEVICES SHALL BE ACCEPTED PURSUANT TO THE RULES AND REGULATIONS PROMULGATED BY THE COMMISSIONER, APPROVED BY THE BOARD OF STANDARDS AND APPEALS LISTED BY A NATIONALLY RECOGNIZED INDEPENDANT LABORATORY.

6. THE INSPECTION, MAINTENANCE AND TESTING SCHEDULES AND PROCEDURES FOR FIRE ALARM AND FIRE DETECTION SYSTEMS SHALL BE IN ACCORDANCE WITH NEW YORK CITY BUILDING CODE CHAPTER 17 STRUCTURAL TESTS AND SPECIAL INSPECTIONS, AND THE NEW YORK CITY FIRE CODE.

CARBON MONOXIDE DETECTING DEVICES:

1. CARBON MONOXIDE DETECTING DEVICES SHALL CONFORM TO NEW YORK CITY BUILDING CODE SECTION BC 908.7.

2. CARBON MONOXIDE DETECTING DEVICES SHALL BE INSTALLED AND MAINTAINTAINED IN ALL THE FOLLOWING LOCATIONS: ON THE CEILING OR WALL OUTSIDE OF EACH ROOM USED FOR SLEEPING PURPOSES WITHIN 15 FEET OF THE DOOR TO SUCH ROOM; IN EACH ROOM USED FOR SLEEPING PURPOSES; OR IN EACH STORY OF A DWELLING UNIT.

3. REQUIRED CARBON MONOXIDE DETECTING DEVICES SHALL RECEIVE THEIR PRIMARY POWER FROM A DEDICATED BRANCH CIRCUT OR THE UNSWITCHED PORTION OF A BRANCH CIRCUIT ALSO USED FOR POWER AND LIGHTING AND SHALL BE EQUIPPED WITH A BATTERY BACKUP AND INTERCONNECTED.

4. CARBON MONOXIDE DETECTING DEVICES SHALL BE PROVIDED WITH THE CAPABILITY TO SUPPORT VISIBLE ALARM NOTIFICATION APPLIACNCES IN ACCORDANCE WITH ICC/ANSI A117.1

5. ALL CARBON MONOXIDE DETECTING DEVICES SHALL BE ACCEPTED PURSUANT TO THE RULES AND REGULATIONS PROMULGATED BY THE COMMISIONER, APPROVED BY THE BOARD OF STANDARDS AND APPEALS LISTED BY A NATIONALLY RECOGNIZED INDEPENDANT LABORATORY.

6. THE INSPECTION, MAINTENANCE AND TESTING SCHEDULES AND PROCEDURES FOR FIRE ALARM AND FIRE DETECTION SYSTEMS SHALL BE IN ACCORDANCE WITH NEW YORK CITY BUILDING CODE CHAPTER 17 STRUCTURAL TESTS AND SPECIAL INSPECTIONS, AND THE NEW YORK CITY FIRE CODE.

ACCESSIBILITY:

1. BUILDINGS AND FACILITIES SHALL BE DESIGNED AND CONSTRUCTED TO BE ACCESSIBLE IN ACCORDANCE WITH BC CHAPTER 11 ACCESSIBILITY, BC APPENDICES E, N & P, AND ICC A117.1 (ACCESSIBLE AND USABLE BUILDING FACILITIES).

2. AN ACCESSIBLE ROUTE SHALL BE PROVIDED TO EACH PORTION OF THE BUILDING, TO ACCESSIBLE BUILDING ENTRANCES CONNECTING ACCESSIBLE PEDESTRIAN WALKWAYS AND THE PUBLIC WAY, AND OTHERWISE COMPLY WITH CHAPTER 4, ACCESSIBLE ROUTES, OF THE ICC A117.7.

3. ACCESSIBLE MEANS OF EGRESS TO BE PROVIDED AS PER NEW YORK CITY BUILDING CODE SECTION BC 1007.

4. ALL UNITS SERVED BY AN ELEVATOR IN OCCUPANCY R-2 SHALL BE TYPE B UNITS WITH THE THE ADDITIONAL REQUIREMENTS OF TYPE B UNITS IN R-2 OCCUPANCY PER BC 1107.2 ALL TYPE B UNITS TOILET AND BATHING FACILITIES IN GROUP R-2 MUST COMPLY WITH APPENDIX P OR TYPE A TOILET AND BATHING FACILITIES (BC 1107.2.2). DWELLING UNITS SHALL BE EQUIPPED WITH DOOR WIDTHS AND CLEAR FLOOR SPACES FOR POSSIBLE OCCUPANTS WITH PHYSICAL DISABILITIES. TYPE B UNITS FOR R-2 OCCUPANCY SHALL INCLUDE ADAPTABLE FEATURES AND ABIDE BY REQUIREMENTS SET FORTH FOR ALL APPLICABLE SPACES IN SECTION BC 1107.

5. DOOR CLOSERS SHALL BE ADJUSTED SO THAT FROM AN OPEN POSITION OF 90 DEGREES, THE TIME REQUIRED TO MOVE THE DOOR SHALL BE 5 SECONDS MINIMUM.

6. OPERABLE PARTS SHALL BE PLACED WITHIN ONE OR MORE OF THE REACH RANGES SPECIFIED IN SECTION 308 OF THE ICC A117.1 AND BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING OR TWISTING OF THE WRIST AS PER SECTION 309 OF THE ICC A117.1.

7. BLOCKING FOR THE FUTURE INSTALLATION OF GRAB BARS TO BE PROVIDED IN ALL ACCESSIBLE BATHROOMS AS DESCRIBED IN SECTION 604 OF ICC A117.7. GRAB BARS, SHOWER SEATS, AND DRESSING ROOM BENCH SEATS SHALL BE DESIGNED TO MEET THE REQUIREMENTS OF NEW YORK CITY BUILDING CODE SECTION BC 1607.7.2.

8. INTERIOR ACCESS, FLOOR SURFACES, ADAPTABLE KITCHENS, ADAPTABLE KITCHENETTES AND ADAPTABLE BATHROOMS SHALL BE AS PER ICC A117.1.

ENERGY EFFICIENCY NOTES:

1. BUILDING SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE ENERGY CONSERVATION CONSTRUCTION CODE OF NEW YORK STATE.
2. TO THE BEST OF MY KNOWLEDGE, BELIEF AMD PROFESSIONAL JUDGMENT, THESE PLANS AND SPECFICATIONS ARE IN COMPLIANCE WITH THE 2011 NEW YORK CITY ENERGY CONSERVATION CONSTRUCTION CODE.

PLUMBING SYSTEM NOTES:

1. THE NEW YORK CITY PLUMBING CODE SHALL GOVERN THE ERECTION, INSTALLATION, ALTERATION, REPAIRS, RELOCATION, REPLACEMENT, ADDITION TO, USE OR MAINTENCANCE OF PLUMBING EQUIPMENT AND SYSTEMS. PLUMBING SYSTEMS AND EQUIPMENT SHALL BE CONSTRUCTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW YORK CITY PLUMBING CODE.

2. ALL MATERIALS AND EQUIPMENT INSTALLED SHALL BE OF MANUFACTURER AND MODEL APPROVED FOR USE IN NEW YORK CITY, COMPLETE WITH M.E.A. APPROVAL NUMBERS.

3. ALL GAS-FIRED EQUIPMENT AND ACCESSORY EQUIPMENT OR DEVICES TO BE AGA OR MEA APPROVED.

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

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

MECHANICAL SYSTEM NOTES:

1. MECHANICAL APPLIANCES, EQUIPMENT AND SYSTEMS SHALL BE CONSTRUCTED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW YORK CITY MECHANICAL CODE AND THE NEW YORK CITY FUEL GAS CODE. MASONRY CHIMNEYS, FIREPLACES AND BARBECUES SHALL COMPLY WITH THE NEW YORK CITY MECHANICAL CODE AND NEW YORK CITY BUILDING CODE CHAPTER 21 MASONRY.

2. ALL BATHROOM AND TOILET ROOMS TO HAVE MECHANICAL VENTILATION PROVIDING MINIMUM 50 CFM EXHAUST.

3. ALL KITCHENETTES TO BE PROVIDED WITH MECHANICAL VENTILATION PROVIDING MIN 125 CFM EXHAUST KITCHEN DUCT.

4. DUCT RISERS TO BE FIRE PROTECTED WITH TWO (2) LAYERS TYPE 'X' GYPSUM BOARD ON ALL SIDES, ATTACHED WITH CONSTRUCITON ADHESIVE AND 18 GA WIRE TIES @ 4'-0" O.C. (NO SCREWS TO BE USED).

5. WHERE DUCTS PASS THROUGH FLOOR, FLOOR OPENINGS TO BE CUT TIGHT TO DUCT, AND REMAINING GAP BETWEEN DUCT AND FLOOR CONSTRUCTION TO BE FILLED WITH MINERAL WOOL.

6. EACH BATHROOM AND KITCHEN TO BE EQUIPPED WITH ITS OWN INDEPENDENT EXHAUST BLOWER WITH BACKDRAFT DAMPER.

7. EACH BATHROOM AND KITCHEN OUTLET TO BE EQUIPPED WITH A BSA APPROVED FIRE DAMPER.

8. MINIMUM 12'X12' OUTDOOR AIR INTAKE (F.A.I.) with BSA APPROVED FIRE DAMPER TO BE PROVIDED FOR BOILER ROOM.

NOISE CONTROL IN MULTIPLE DWELLING BUILDINGS:

1. NOISE CONTROL IN MULTIPLE DWELLING BUILDINGS TO MEET NEW YORK CITY BUILDING CODE SECTION BC 1207; ALL SOUND ATTENUATION LOCATIONS AND DETAILS ARE TO BE INDICATED ON THE PLANS AND PARTITION SCHEDULES.

CONTRACTOR SUBMITTALS:

1. CONTRACTOR SHALL PROVIDE THE FOLLOWING FORMS TO THE APPLICANT FOR SUBMITTAL TO THE DEPARTMENT OF BUILDINGS:
   A. CONCRETE MASORY FORMS 10H AND 10J
   B. QUALITY OF STEEL AFFIDAVIT FORM 2055

CONTROLLED INSPECTIONS:

THE FOLLOWING ITEMS OF WORK SHALL BE SUBJECT TO CONTROLLED INSPECTION, MADE AND WITNESSED BY OR UNDER THE DIRECT SUPERVISION OF AN ARCHITECT OR ENGINEER, RETAINED BY THE OWNER AND ACCEPTABLE TO THE ARCHITECT OF RECORD. TEST REPORTS AND CERTIFICATE OF INSPECTION SHALL BE FILED WITH THE DEPARTMENT OF BUILDING.

LIST OF CONTROL INSPECTIONS:

TR-1

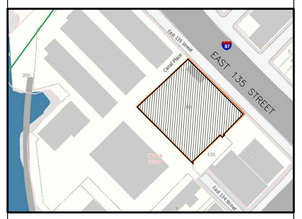
- WALL PANELS, CURTAIN WALLS, AND VENEERS	BC 1704.10
- EXTERIOR INSULATION FINISH SYSTEM (EIFS)	BC 1704.12
- FIRESTOP, DRAFSTOP, AND FIREBLOCK SYSTEMS	BC 1704.25
- FRAME INSPECTION	BC 109.3.3
- ENERGY CODE COMPLIANCE INSPECTION TR8	BC 109.3.5
- FIRE-RESISTANCE RATED CONSTRUCTION	BC 109.3.4

HOUSING MAINTENANCE CODE NOTES

1. DUTIES OF THE OWNER SHALL BE AS PER SECTION D26-10.01 OF H.M.C.
2. DUTIES OF TENANTS SHALL BE AS PER SECTIONS D26-10.03 & 10.05 OF H.M.C.
3. THE OWNER OF THE MULTIPLE DWELLINGS SHALL KEEP THE PREMISES IN GOOD REPAIR.
4. OWNER'S RIGHT OF ACCESS SHALL BE AS PER SECTION D26-10.07 OF H.M.C.
5. INTERIOR OF DWELLING UNIT SHALL BE CLEANED AS PER SECTION D26-11.05 OF H.M.C.
6. THE OWNER SHALL KEEP THE ROOF, YARDS, COURTS & OTHER OPEN SPACES CLEAN & FREE FROM DIRT, FILTH, GARBAGE OR OTHER OFFENSIVE MATERIALS.
7. PAINTING OF PUBLIC PARTS & WITHIN DWELLINGS TO COMPLY WITH SECTION D26-12.01 OF H.M.C.
8. PAINTING OF WINDOW FRAMES TO COMPLY WITH SECTION D26-12.03 OF H.M.C.
9. PREMISES TO BE MAINTAINED & KEPT FREE OF RODENT & INSECT INFESTATION AS PER SECTIONS D26-13.03 & D26-13.05 OF H.M.C.
10. RECEPTACLES FOR COLLECTION OF WASTE MATTER TO BE PROVIDED AS PER SECTION D26-14.03 & D26-14.05 OF H.M.C.
11. SANITARY FACILITIES IN MULTIPLE DWELLINGS & LIGHT & VENTILATION FOR TOILET COMPARTMENTS SHALL BE AS PER SECTIONS D26-31.01, D26-31.03, D26-31.05, D26-31.07, & D26-31.11 OF H.M.C.
12. PROVIDE & MAINTAIN A SUPPLY OF PURE & WHOLESOME WATER SUFFICIENT IN QUANTITY & AT SUFFICIENT PRESSURE TO KEEP ALL PLUMBING FIXTURES ADEQUATELY SUPPLIED FOR THEIR SANITARY MAINTENANCE AS PER SECTIONS D26-15.01 & D26-15.03 OF H.M.C.
13. MAINTAIN & KEEP IN GOOD REPAIR THE PLUMBING & DRAINAGE SYSTEM INCLUDING WATER CLOSETS, TOILETS, SINKS & OTHER FIXTURES AS PER D26-16.01 OF H.M.C.
14. DRAINAGE OF ROOFS, COURTS & YARDS SHALL COMPLY WITH D26-16.03 OF H.M.C.
15. HEAT & HOT WATER REQUIREMENTS AS PER ARTICLE 17 OF H.M.C. CENTRAL HEATING SYSTEM AS PER BUILDING CODES; MINIMUM TEMPERATURES TO BE MAINTAINED AS PER SECT. D26-17.03. CENTRAL HEATING SYSTEM TO BE INSPECTED YEARLY BY QUALIFIED PERSON IN ACCORDANCE WITH SECTION D26-17.05 OF H.M.C. SUPPLY OF HOT WATER AS PER SECTION D26-17.07 OF H.M.C.
16. YEARLY INSPECTIONS OF CENTRAL HEATING PLANT BY QUALIFIED PERSON TO BE MADE AS PER SECTION D26-17.05 OF H.M.C.
17. PROVIDE ELECTRIC LIGHTING EQUIPMENT IN ALL DWELLINGS AS PER SECTIONS D26-19.01 OF H.M.C. AND C26-605AC, C26-1203AC, & SECTION 26 TO 35 OF MDL.
18. PROVIDE & MAINTAIN ELECTRIC LIGHTING FIXTURES IN EVERY PUBLIC HALL, STAIR OR FIRE STAIR, ENTRANCE WAY, COURT, OR YARD IN ACCORDANCE WITH SECTIONS D26-19.03, D26-19.05, & D26-19.07 OF H.M.C.
19. PROPER ELECTRIC LIGHTS TO BE PROVIDED NEAR ENTRANCE WAYS, YARDS & COURTS AS PER SECTION D26-19.07 OF H.M.C., ON SEPARATE CIRCUIT OR CONNECTED TO HOUSE LINE SERVICING PUBLIC HALLS, AND IN ACCORDANCE WITH REQUIREMENTS & APPROVAL OF THE DEPARTMENT OF WATER SUPPLY, GAS & ELECTRICITY.
20. BOARD OF STANDARDS & APPEALS APPROVED TYPE PEEPHOLES APPROXIMATELY 5 FEET ABOVE FINISHED FLOOR TO BE PROVIDED IN ENTRANCE DOORS OF DWELLING UNITS AS PER SECTION D26-20.01 OF H.M.C. & DEPARTMENT RULES & REGULATIONS.
21. ENTRANCE DOORS SHALL BE PROVIDED WITH HEAVY DUTY LATCH SET & A HEAVY DUTY DEAD BOLT OPERABLE WITH A KEY FROM THE OUTSIDE & A THUMB-TURN FROM THE INSIDE; EQUIP DOORS WITH A CHAIN DOOR GUARD SO AS TO PERMIT PARTIAL OPENING AS PER SECTION D26-20.05 OF H.M.C.
22. KEY LOCK IN THE ENTRANCE DOOR TO EACH DWELLING UNIT WITH AT LEAST ONE KEY TO BE PROVIDED BY OWNER AS PER D26-20.05 OF H.M.C.
23. PROPERLY MOUNTED & SECURED POLISHED METAL VIEWING MIRRORS TO BE PROVIDED WITHIN SELF-SERVICE ELEVATORS AS PER SECTION D26-20.03 OF H.M.C. & DEPARTMENT RULES & REGULATIONS.
24. APPROVED TYPE MAIL RECEPTACLES & DIRECTORY OF PERSONS LIVING IN DWELLING TO BE PROVIDED AS PER SECTION D26-21.01 OF H.M.C. & REGULATIONS OF POST OFFICE DEPARTMENT.
25. PROPER FLOOR SIGNS TO BE PROVIDED IN PUBLIC HALL NEAR STAIRS & ELEVATORS & WITHIN STAIR ENCLOSURE AS PER SECTION D26-21.03 OF H.M.C. & DEPARTMENT RULES & REGULATIONS.
26. PROPER STREET NUMBERS PLAINLY VISIBLE FROM THE SIDEWALK IN FRONT OF THE DWELLING TO BE POSTED ON THE DWELLING AS PER SECTION D26-21.05 OF H.M.C. AND RULES & REGULATIONS OF BOROUGH PRESIDENT.
27. A RESIDENT MANAGER RESPONSIBLE FOR OPERATION & MAINTENANCE OF ROOMING UNITS TO BE PROVIDED AS PER SECTION D26-21.09 OF H.M.C.
28. PROPER JANITORIAL SERVICES TO BE PROVIDED AS PER SECTION D26-22.03 OF H.M.C.
29. ALL COMBUSTIBLE MATERIALS WITHIN ONE FOOT OF COOKING APPARATUS TO BE PROPERLY FIRE RETARDED & MINIMUM 2-FOOT CLEARANCE MAINTAINED ABOVE EXPOSED COOKING SURFACE. COMBUSTIBLE MATERIAL BETWEEN 2 FEET & 3 FEET ABOVE EXPOSED COOKING SURFACE TO BE FIRE RETARDED. SECTION D26-32.05 OF H.M.C. & DEPARTMENT RULES & REGULATIONS.
30. MINIMUM ROOM SIZE SHALL BE AS PER D26-33.01 AND MAXIMUM OCCUPANCY SHALL BE AS PER D26-33.03 OF H.M.C.
31. NATURAL LIGHT AND VENTILATION SHALL BE PROVIDED AS PER D26-30.14 AND 30.03 OF HMC.
32. KITCHENS AND KITCHENETTES SHALL BE PROVIDED WITH PROPER FACILITIES, EQUIPMENT, LIGHTING, VENTILATION AND FIRE PROTECTION AS PER D26- 32.01, 32.03, AND 32.05 OF H.M.C.
33. NO KITCHEN SHALL BE OCCUPIED FOR SLEEPING PURPOSES. SECTION D26-33.05 OF H.M.C.
34. MAXIMUM TWO BOARDERS, ROOMERS OR LODGERS PERMITTED TO EACH FAMILY EXCEPT THAT MAXIMUM ONE BOARDER, ROOMER OR LODGER PERMITTED IF LOCATED IN ZONING TO ONE & TWO FAMILY DWELLINGS.
35. OCCUPANCY OF CELLARS AND BASEMENTS SHALL BE AS PER D26-34.01, 34.03, AND 34.05 OF H.M.C.
36. REGISTRATION STATEMENT TO BE FILED AS PER SECTION D26-41.01 & D26-41.03 OF H.M.C.
37. REGISTRATION IDENTIFICATION, SIGN CONTACT (OWNER AND MANAGEMENT), AND DWELLING SERIAL NUMBER TO BE POSTED AS PER SECTION D26-41.15 OF H.M.C.
38. IDENTIFICATION OF MANAGING AGENT OR OWNER TO BE INDICATED ON TENANT'S RENT RECEIPT AS PER SECTION D26-41.17 OF H.M.C.

NOTE:
HOUSING MAINTENANCE CODE NOTES APPLY TO THE OWNER AFTER OCCUPANCY AND ARE NOT SUBJECT TO COMPLIANCE BY CM DURING CONSTRUCTION.

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

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project title
RESIDENTIAL DEVELOPMENT
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drawing title
GENERAL NOTES

dob no

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drawn	drawing no. G-002.00
checked KF	

MULTIPLE DWELLING LAW NOTES:

1. LIGHTING AND VENTILATION OF ROOMS SHALL BE AS PER SECTION 31 OF MDL.
2. SIZE OF ROOMS AS PER SECTION 31 OF MDL.
3. ALCOVES SHALL BE AS PER SECTION 32 OF MDL.
4. COOKING SPACES SHALL BE AS PER SECTION 33 OF MDL.
5. ROOMS IN BASEMENTS AND CELLARS SHALL BE AS PER SECTION 34 OF MDL.
6. BUILDING ENTRANCE DOORS AND LIGHTS SHALL BE AS PER SECTION 35 OF MDL.
7. WINDOWS AND SKYLIGHTS FOR PUBLIC HALLS AND STAIRS SHALL BE AS PER SECTION 36 OF MDL.
8. ARTIFICIAL HALL LIGHTING SHALL BE AS PER SECTION 37 OF MDL.
9. ENTRANCE HALLS TO BE AS PER SECTION 50 OF MDL.
10. BUILDING ENTRANCE DOORS, LOCKS AND INTERCOM SYSTEM SHALL BE SECTION 50-A OF MDL.
11. ALL SHAFTS, ELEVATORS AND DUMBWAITERS SHALL BE AS PER SECTION 51 OF MDL.
12. APARTMENT PEEPHOLES SHALL BE AS PER SECTION 51-A OF MDL.
13. MIRRORS IN SELF-SERVICE ELEVATORS SHALL BE AS PER SECTION 51-B OF MDL.
14. STAIRS SHALL BE AS PER SECTION 52 OF MDL.
15. FIRE ESCAPES SHALL BE AS PER SECTION 53 OF MDL.
16. WAINSCOTING SHALL BE AS PER SECTION 55 OF MDL.
17. ENTRANCE BOLTS AND MAIL BOXES SHALL BE AS PER SECTION 57 OF MDL.
18. ALL INCOMBUSTIBLE MATERIALS SHALL BE AS PER SECTION 58 OF MDL.
19. PARAPETS AND GUARD RAILINGS SHALL BE AS PER SECTION 62 OF MDL.
20. BELOW GRADE FLOORS SHALL COMPLY AS PER SECTION 63 OF MDL.
21. LIGHTING, GAS METERS, GAS AND OIL APPLIANCES, SHALL BE AS PER SECTION 64 OF MDL.
22. BOILER ROOMS SHALL BE AS PER SECTION 65 OF MDL.
23. WATER SUPPLY SHALL BE AS PER SECTION 75 OF MDL.
24. WATER CLOSET AND BATH ACCOMMODATIONS SHALL BE AS PER SECTION 76 OF MDL.
25. PLUMBING AND DRAINAGE SHALL BE AS PER SECTION 77 OF MDL.
26. REPAIRS SHALL BE MADE AS PER SECTION 78 OF MDL.
27. HEAT SHALL BE PROVIDED AS PER SECTION 79 OF MDL.
28. CLEANLINESS SHALL BE AS PER SECTION 80 OF MDL.
29. RECEPTACLES FOR WASTE MATTER SHALL BE AS PER SECTION 81 OF MDL.
30. PRIVACY SHALL BE AS PER SECTION 82 OF MDL.
31. JANITORIAL SERVICES SHALL BE AS PER SECTION 83 OF MDL.
32. CONSTRUCTION STANDARDS FOR THE CONTROL OF NOISE SHALL BE AS PER SECTION 84 OF MDL.

ARTICLE NO. 4:

33. FIRE PROOF CONSTRUCTION AS PER SECT. 101 OF MDL.
34. FIRE PROOF STAIRS AS PER SECT. 102 OF MDL.
35. EGRESS FROM APARTMENTS AS PER SECT. 103 OF MDL.
36. STAIR BULKHEAD AS PER SECT. 104 OF MDL.
37. SEPARATION AND VENTILATION OF FIRE PROOF STAIRS AS PER SECT. 105 OF MDL.
38. CELLAR AND BASEMENT FIRE STAIRS AS PER SECT. 106 OF MDL.
39. PUBLIC HALL AS PER SECT. 107 OF MDL.
40. PARTITIONS AS PER SECT. 108 OF MDL.
41. INTERIOR WATER CLOSETS AND BATHROOMS AS PER SECT. 115 OF MDL.

MULTIPLE DWELLING LAW - M.D.L. 277:

1. (a) EXTERIOR WALLS 3 HOUR FIRE RATED OR 30'-0" SEPARATION
   (b) LOT LINE WINDOWS PER TABLE 3-4, CHAPTER 26 OF THE ADMINISTRATIVE CODE OF THE CITY OF NEW YORK OR ONE SPRINKLER HEAD.
2. BUILDING TO BE:
   (a) FIREPROOF , NO HEIGHT LIMIT
   (c) COMPLY WITH TABLE 503
3. MANUFACTURING/COMMERCIAL USE : LIMITED TO 2 ND FLOOR & BELOW (PROPOSED @ BASEMENT FLOOR)
4. MANUFACTURING/COMMERCIAL : WET SPRINKLER REQUIRED
5. TENANTS TO HAVE ONE HOUR FIRE SEPARATION
6. CELLAR TO HAVE FIRE RETARDED CEILING PER M.D.L. 61, COMMERCIAL SPACES TO HAVE FIRE RETARDED CEILING PER M.D.L. 61
7. (b) i) A) EVERY DWELLING UNIT MIN. ONE WINDOW WITH 15'-0" SEPARATION MINIMUM
   E) IN NO EVENT SHALL THE DISTANCE BETWEEN SUCH WINDOWS AND THE REAR LOT LINE BE LESS THAN 5'-0"
   ii) A) 10% WINDOW FOR ROOMS UP TO 500 sq.ft.
   B) DECREASE BY 1% FOR EVERY 100 sq.ft. GREATER THAN 500 sq.ft. TO A MINIMUM OF 5%
   C) IN NO EVENT SHALL THE DISTANCE BETWEEN SUCH WINDOWS AND THE REAR LOT LINE BE LESS THAN 5'-0"
   D) 50% OPERABLE
   (c) NO INTERIOR ROOMS PERMITTED, HOME OCCUPATION SPACES TO BE MECHANICALLY VENTILATED
   (d) NO ENLARGEMENTS EXCEPT WHERE UNDERLYING DISTRICT PERMITS RESIDENTIAL USE
   (e) 40% OPEN KITCHEN PART OF ADJACENT SPACE
   (f) TOILET VENTILATION 50 CPM BY MECHANICAL MEANS
   (g) SMOKE DETECTOR OUTSIDE OF EACH SLEEPING AREA
8. ONE HOUR FIRE PARTITION BETWEEN APARTMENTS WITH FIREPROOF SELF CLOSING ENTRY DOOR. ALL WINDOWS ON FIRE ESCAPES TO BE WIRE GLASS.
9. EGRESS:
   (b) (ii) EGRESS FROM FIREPROOF BUILDING: AN ENCLOSED HALLWAY AND TWO INDEPENDENTLY ENCLOSED STAIRS.
10. SKYLIGHT 20 sq.ft. IN STAIR WITH 144 sq.ft. IN FIXED OPENING
11. ALL SHAFTS 2 HOUR FIRE RATED
12. COOKING SPACE TO COMPLY WITH M.D.L. 33
13. M.D.L. TITLE 3 ARTICLE 3 SHALL APPLY
14. INTERIOR IRON COLUMNS TO BE 3 HOUR PROTECTED OR SPRINKLED
15. ELEVATOR SHAFTS TO BE 2 HOUR RATED NON COMBUSTIBLE

M.D.L. 278 BUILDING TO COMPLY WITH THE FOLLOWING:

ARTICLE:
1. INTRODUCTORY PROVISIONS
2. MISCELLANEOUS APPLICATION EXCEPT SUBDIVISION 2 OF SECTION 9
8. REQUIREMENTS AND REMEDIES
9. REGISTRY OF NAMES & SERVICE OF PAPERS
10. PROSTITUTION
11. LAWS REPEALED: SAVING CLAUSE: EFFECT

SECTION:
28. TWO OR MORE BUILDING ON SAME LOT N/A
29. PAINTING OF COURTS & SHAFTS
31. SIZE OF ROOMS SUBDIVISION 6 ONLY
37. ARTIFICIAL HALL LIGHTING
53. FIRE ESCAPES
55. WAINSCOTING SUBDIVISION 2 ONLY
56. FRAME BUILDINGS AND EXTENSIONS : N/A
57. BELLS: MAIL RECEPTACLES
58. INCOMBUSTIBLE MATERIALS
59. BAKERIES AND FAT BOILING N/A
60. MOTOR VEHICLE STORAGE N/A
61. BUSINESS USES (EXCEPT PARA. C OF SUBDIVISION 1 AND SUBDIVISION 3)
62. PARAPETS, GUARD RAILINGS AND WIRES

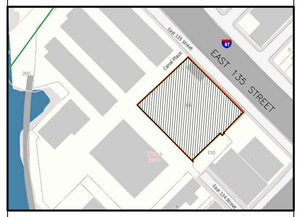
NEW YORK CITY DEPARTMENT OF HEALTH AND MENTAL HYGIENE
WINDOW GUARD REGULATIONS OF THE CITY OF NY 6-30-91: CHAPTER 12
§12-10: SPECIFICATIONS FOR WINDOW GUARD DOUBLE HUNG WINDOWS.

A. GUARDS SHALL BE CONSTRUCTED OF RIGID METAL, FREE OF SHARP PROJECTIONS, EDGES, OR ROUGH SURFACES.
B. GUARDS SHALL BE CONSTRUCTED AS TO REJECT THE PASSAGE OF A SOLID FIVE(5) INCH SPHERE AT EVERY SPACE AND INTERVAL.
C. GUARDS SHALL BEAR A ONE HUNDRED AND FIFTY POUND (150 LB.) LOAD AT CENTER SPAN WHEN EXTENDED TO MAXIMUM WIDTH. A TEST WITH THE GUARD ATTACHED IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS FOR INSTALLATION MUST BE PERFORMED, AND THE RESULTS, INCLUDING INFORMATION AS TO TEMPORARY OR PERMANENT DISTORTION, CERTIFIED BY A PROFESSIONAL ENGINEER, OR INDEPENDENT TESTING LABORATORY.
D. 1. ON GUARDS UTILIZING NON-TELESCOPING BARS, THERE SHALL BE A PERMANENT SPOT WELD ON AT LEAST TWO OF THE HORIZONTAL BARS SO AS TO PROVIDE A MINIMUM OF TWO (2) INCHES OVERLAP WHEN THE GUARD IS FULLY EXTENDED.
2. ON TELESCOPING BARS, WHEN THE GUARD IS EXTENDED TO THE MAXIMUM ALLOWABLE WIDTH, THERE SHALL BE A MINIMUM OVERLAP OF FIVE (5) INCHES OR 1/3 OF THE LENGTH OF THE BAR, WHICHEVER IS GREATER.
3. A PERMANENT LABEL SHALL BE AFFIXED ON AT LEAST ONE HORIZONTAL BAR, ONEACH FACING SURFACE. SAID LABEL SHALL READ: **WARNING! EXTENSION OF THIS GUARD BEYOND ___ INCHES IS DANGEROUS AND ILLEGAL.** *INSERT THE NUMBER OF INCHES APPROPRIATE TO THE PARTICULAR MODEL IN THE SPACE.
4. ON TELESCOPING GUARDS, THERE SHALL BE AN ADDITIONAL STILE OR OTHER APPROVED SUPPORT(S), AT THE TELESCOPIC OPENING OF THE OUTER TUBING OF THE BARS, THAT SHALL PREVENT ANY SPREADING OF THE BARS.
E. GUARDS SHALL BE A MINIMUM OF FIFTEEN (15) INCHES HIGH MEASURED ALONG THE VERTICAL STILES.
F. THE CHANNEL STILES SHALL EACH HAVE AT LEAST TWO (2) HOLES FOR PERMANENT WINDOW MOUNTING. IF GUARDS ARE MORE THAN FIFTEEN INCHES (15")IN HEIGHT, ADDITIONAL MOUNTING HOLES ARE REQUIRED TO PROVIDE A MAXIMUM INTERVAL OF EIGHTEEN INCHES (18") BETWEEN MOUNTING HOLES.
G. STOPS.
1. RIGID METAL "L" SHAPED STOPS, TO BE A MINIMUM OF ONE HALF THE WIDTH OF THE WINDOW TRACK AND EACH LEG OF WHICH SHALL MEASURE AT LEAST TWO INCHES, SHALL BE INSTALLED SECURELY WITH TWO (2) SCREWS IN THE UPPER TRACKS OF EACH SIDE OF THE BOTTOM WINDOW TO PREVENT THE LOWER WINDOW FROM BEING RAISED MORE THAN 4 ½ INCHES ABOVE THE LOWEST SECTION OF THE TOPHORIZONTAL BAR OF THE WINDOW GUARD.
2. WHERE "L" SHAPED STOPS CANNOT BE PLACED IN THE WINDOW TRACK WITHOUT INTERFERING WITH THE NORMAL OPERATION OF THE WINDOW, A RIGID METAL STRIP MAY BE SECURELY FASTENED ACROSS THE TRACK OF THE BOTTOM WINDOW TO PREVENT THE LOWER WINDOW FROM BEING RAISED MORE THAN 4 ½ INCHES ABOVE THE LOWEST SECTION OF THE TOP HORIZONTAL BAR OF THE WINDOW GUARD. STRIPS SHALL BE MOUNTED ON EACH OF THE WINDOWS AND SHALL BE SECURED BY TWO (2)SCREWS ON EACH SIDE OF THE WINDOW TRACK.
3. IN SITUATIONS WHERE THE STOPS DESCRIBED IN (1) AND (2) ABOVE CANNOT BE USED, SUCH AS IN BALLAST WINDOWS, RIGID METAL "L" SHAPED STOPS MAYBE SECURELY FASTENED TO THE FRAME OF THE WINDOW TO PREVENT THE LOWER WINDOW FROM BEING RAISED MORE THAN 4 ½ INCHES ABOVE THE LOWEST SECTION OF THE TOP HORIZONTAL BAR OF THE WINDOW GUARD. A STOP SHALL BE SECURELY MOUNTED ONE EACH SIDE OF THE EXTERIOR LOWER WINDOW FRAME AND SHALL BE SECURED BY TWO (2)SCREWS IN EACH STOP.
4. IN SPECIAL SITUATIONS WHERE THE STOPS DESCRIBED IN (1), (2), AND (3)ABOVE CANNOT BE USED, AN APPLICATION MAY BE MADE TO THE WINDOW GUARD POLICY AND ACCEPTANCE BOARD FOR APPROVAL OF AN ALTERNATIVE STOPPING DEVICE.
5. STOPS ARE NOT REQUIRED WHERE APPROVED WINDOW GUARDS ARE INSTALLED THAT ARE OF SUFFICIENT HEIGHT TO PREVENT AN OPENING OF MORE THAN 4 ½ INCHES ABOVE THE LOWEST SECTION OF THE TOP HORIZONTAL BAR OF THE WINDOW GUARD WHEN THE LOWER WINDOW IS RAISED TO IT'S MAXIMUM OPEN POSITION.
H. SCREWS. SCREWS USED TO MOUNT WINDOW GUARDS AND STOPPING DEVICES SHALL BE ONE WAY SHEET METAL SCREWS OR TAMPER RESISTANT SCREWS. TAMPER RESISTANT SCREWS ARE DEFINED AS SCREWS REQUIRING SPECIAL TOOLS FOR THEIR INSTALLATION AND/OR REMOVAL, WHICH TOOLS ARE NOT READILY AVAILABLE IN RETAIL HARDWARE STORES. ALL TAMPER RESISTANT SCREWS MUST BE COUNTER-SUNK FLUSH WITH THE STILE OR STOPPING DEVICE. APPROPRIATE SCREWS SHALL BE:
   1. MINIMUM SIZE #10 AND LONG ENOUGH TO PENETRATE ONE (1) INCH INTO A WOODEN WINDOW FRAME, OR
   2. OF AN ADEQUATE TYPE, SIZE, AND LENGTH TO BE SECURELY FASTENED TO A METAL WINDOW FRAME. MANUFACTURER SHALL SUPPLY ALL REQUIRED SCREWS WITH GUARDS.
1. THE COATING OF GUARDS SHALL BE UNLEADED. THE STATEMENT FROM THE PAINT MANUFACTURER ATTESTING TO THIS FACT MUST ACCOMPANY APPLICATIONS FOR WINDOW GUARD APPROVAL.
2. CODED MANUFACTURER'S IDENTIFICATION SYMBOL (GUARD MODEL), HEALTH DEPARTMENT APPROVAL NUMBER, AND FABRICATION DATE SYMBOLS (MONTH AND YEAR) SHALL BE IMPRINTED INDELIBLY (DIE STAMPED), ON ONE OF THE END STILES, SO LOCATED AS TO BE READILY VISIBLE WHEN VIEWED FROM WITHIN THE ROOM WHERE THEGUARD HAS BEEN INSTALLED.
3. EACH GUARD SOLD BY A MANUFACTURER SHALL BE SOLD WITH A SELF-CONTAINED ENVELOPE OR PLASTIC BAG CONTAINING:
   1. APPROVED INSTALLATION INSTRUCTIONS,
   2. "L" SHAPED OR OTHER APPROVED STOPS, AND
   3. SPECIFIED SCREWS FOR INSTALLATION OF GUARD AND STOPS. IF WOOD SCREWS ARE SUPPLIED BY THE MANUFACTURER, A WARNING LABEL SHOULD BE INCLUDED STATING THAT FOR METAL INSTALLATIONS, APPROPRIATE TYPE, SIZE, AND LENGTH SCREWS MUSTBE SUBSTITUTED. THE WARNING SHALL BE IMPRINTED ON THE PACKAGING CONTAINER.
L. INSTRUCTIONS FOR SAFE INSTALLATION SHOULD BE PROVIDED WITH EACH GUARD BY MANUFACTURER.
1. INSTRUCTIONS SHALL SPECIFY MAXIMUM WINDOW WIDTH FOR WHICH THE GUARD IS INTENDED, AND SHALL CONTAIN THE FOLLOWING PROMINENTLY PRINTED WARNING: **WARNING: USE OF THIS GUARD BEYOND SPECIFIED MAXIMUM WIDTH IS DANGEROUS AND ILLEGAL.**
2. INSTRUCTIONS SHALL PROMINENTLY WARN THAT GUARDS AND STOPS MUST BE INSTALLED ONLY IN SOUND (NON-ROTTING) WINDOW TRACKS.
INSTRUCTIONS SHALL PROMINENTLY SPECIFY: **WINDOW GUARDS MAY NOT BE INSTALLED IN WINDOWS PROVIDING ACCESS TO FIRE ESCAPES.**
3. INSTRUCTIONS SHALL SPECIFY THAT GUARDS BE INSTALLED SO THAT THE BOTTOM HORIZONTAL MEMBERS ARE MOUNTED A MAXIMUM OF 4 ½ INCHES ABOVE THE WINDOWSILL.
INSTRUCTIONS SHALL SPECIFY THE USE OF SUPPLIED "L" SHAPED STOPS TO BE INSTALLED WITH SCREWS PROVIDED, OR ALTERNATIVE APPROVED STOPPING DEVICES ALSO PROVIDED WITH PRESCRIBED SCREWS, TO LIMIT THE OPENING ABOVE THE LOWEST SECTION OF THE TOP HORIZONTAL BAR TO 4 ½ INCHES WHEN THE BOTTOM SASH IS RAISED.

§12-11: SPECIFICATIONS FOR WINDOW GUARDS FOR OTHER THAN DOUBLE HUNG WINDOWS.

A. APPLICATIONS FOR APPROVAL OF WINDOW GUARDS FOR USE IN OTHER THAN DOUBLE HUNG WINDOWS SHALL SPECIFY THE WINDOW TYPE(S) FOR WHICH THE GUARD SUBMITTED IS INTENDED. MOUNTING MATERIALS AND INSTRUCTIONS FOR INSTALLATION FOR EACH SPECIFIC TYPE OF WINDOW MUST BE INCLUDED WITH THE APPLICATION AND MUST BE PROVIDED TO THE CONSUMER WITH THE GUARDS.
B. GUARDS SHALL BE CONSTRUCTED SO AS TO REJECT THE PASSAGE OF A SOLID FIVE (5) INCH SPHERE AT EVERY SPACE AND INTERVAL.
C. GUARDS INTENDED FOR ENCASEMENTS, SLIDERS, AND OTHER TYPES OR COMBINATIONS WINDOWS IN WHICH THE HEIGHT OF THE OPENINGS ARE NOT SUBJECT TO LIMITATION, MUST BE OF SUCH SIZE AS TO FILL THE ENTIRE APERTURE, AND MUST REJECT PASSAGE OF A SOLID FIVE (5) INCH SPHERE AT EVERY SPACE AND INTERVAL.
   1. WHEN APPROVED LIMITING DEVICES ARE UTILIZED IN LIEU OF WINDOW GUARDS, THE SIZE OF ANY UNGUARDED OPENING MAY NOT EXCEED 4 ½ INCHES SO AS TO REJECT PASSAGE OF A SOLID FIVE (5) INCH SPHERE AT EVERY SPACE AND INTERVAL.
   2. ON GUARDS UTILIZING NON-TELESCOPING BARS, THERE SHALL BE A PERMANENT SPOT WELD ON AT LEAST TWO (2) OF THE HORIZONTAL BARS SO AS TO PROVIDE A MINIMUM OF TWO (2) INCHES OVERLAP WHEN FULLY EXTENDED.
   3. ON TELESCOPING BARS, WHEN THE GUARD IS EXTENDED TO THE MAXIMUM ALLOWABLE WIDTH, THERE SHALL BE A MINIMUM OVERLAP OF FIVE (5) INCHES OR 1/3 OF THE LENGTH OF THE BAR, WHICHEVER IS GREATER.
   4. A PERMANENT LABEL SHALL BE AFFIXED ON AT LEAST ONE HORIZONTAL BAR ONE EACH FACING SURFACE. SAID LABEL SHALL READ: **WARNING! EXTENSION OF THIS GUARD BEYOND ___ INCHES IS DANGEROUS AND ILLEGAL.** *INSERT THE NUMBER OF INCHES APPROPRIATE TO THE PARTICULAR MODEL IN THIS SPACE.
   5. ON TELESCOPING GUARDS, THERE SHALL BE AN ADDITIONAL STILE OR OTHER APPROVED SUPPORT(S), AT THE TELESCOPING OPENING OF THE OUTER TUBING OF THE BARS, THAT SHALL PREVENT THE SPREADING OF THE BARS.
D. GUARDS SHALL BEAR A ONE HUNDRED AND FIFTY POUND (150 LB.) LOAD AT IT'S CENTER SPAN WHEN EXTENDED TO IT'S MAXIMUM WIDTH. A TEST WITH GUARDS ATTACHED IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS FOR INSTALLATION MUST BE PERFORMED AND RESULTS CERTIFIED BY A PROFESSIONAL ENGINEER OR INDEPENDENT TESTING LABORATORY. THE INFORMATION SHALL INCLUDE ANY FINDING OF A PERMANENT OR TEMPORARY DISTORTION.
E. EACH CHANNEL STILE SHALL HAVE AT LEAST TWO (2) MOUNTING HOLES. IF GUARD IS MORE THAN 15 INCHES HIGH, ADDITIONAL MOUNTING HOLES ARE REQUIRED TO PROVIDE A MAXIMUM OF 18 INCHES BETWEEN MOUNTING HOLES.
F. COATING OF GUARDS SHALL BE UNLEADED. STATEMENT FROM THE PAINT MANUFACTURER ATTESTING TO THIS FACT SHALL ACCOMPANY THE APPLICATION FOR WINDOW GUARD APPROVAL.
G. CODED MANUFACTURER'S IDENTIFICATION SYMBOL (GUARD MODEL), HEALTH DEPARTMENT APPROVAL NUMBER, AND FABRICATION DATE SYMBOLS (MONTH AND YEAR),SHALL BE IMPRINTED ON ONE OF THE END STILES SO LOCATED AS TO BE READILY VISIBLE WHEN VIEWED FROM WITHIN THE ROOM WHERE THE GUARD HAS BEEN INSTALLED.
H. SLIDING WINDOWS AND VERTICAL PIVOTING WINDOWS MAY USE STOPPING DEVICES IN LIEU OF WINDOW GUARDS AS FOLLOWS:
   1. SLIDING WINDOWS. A SOLID METAL BLOCK, MEASURING AT LEAST ONE HALF THE DEPTH OF THE WINDOW TRACK AND ONE HALF THE WIDTH, SHALL BE SECURELY FASTENED BY TWO (2) SCREWS IN THE BOTTOM WINDOW TRACK, AND A SOLID METAL BLOCK OR AN "L" SHAPED METAL STOP SHALL BE SECURELY FASTENED BY TWO (2) SCREWS IN THE UPPER WINDOW TRACK, TO PREVENT THE WINDOW FROM OPENING MORE THAN 4 ½ INCHES.
   2. VERTICAL PIVOTING WINDOWS. METAL STOPPING DEVICES SHALL BE SECURELY FASTENED TO THE UPPER AND LOWER WINDOW FRAMES BY TWO (2) SCREWS SO AS TOPREVENT THE WINDOW FROM TILTING OPEN MORE THAN 4 ½ INCHES. THE HEIGHT OF THE STOPPING DEVICES SHALL EXTEND NO LESS THAN ONE INCH, NO LESS THAN TWO INCHES BEYOND THE WINDOW FRAME AS NEEDED TO STOP THE WINDOW.
I. FOR TYPES OF NON-DOUBLE HUNG WINDOWS, OTHER THAN THOSE DESCRIBED IN SUBDIVISION (H) AND IN SPECIAL SITUATIONS WHERE THE STOPS DESCRIBED IN SUBDIVISIONS (H) (1) AND (H) (2) CANNOT BE USED, APPLICATION MAY BE MADE TO THE WINDOW GUARD POLICY AND ACCEPTANCE BOARD FOR APPROVAL OF AN ALTERNATE STOPPING DEVICE.
J. SCREWS USED TO MOUNT WINDOW GUARDS AND STOPPING DEVICES SHALL BE ONE WAY METAL, SCREWS OR TAMPER RESISTANT SCREWS. TAMPER RESISTANT SCREWS ARE DEFINED AS SCREWS REQUIRING SPECIAL TOOLS FOR INSTALLATION AND/OR REMOVAL, WHICH TOOLS ARE NOT READILY AVAILABLE IN RETAIL HARDWARE STORES. ALL TAMPER RESISTANT SCREWS SHALL BE COUNTER-SUNK FLUSH WITH THE STILE OR STOPPING DEVICE.
   1. APPROPRIATE SCREWS SHALL BE A MINIMUM SIZE #10 AND SHALL BE LONG ENOUGH TO PENETRATE ONE INCH INTO A WOODEN FRAME, OR
   2. SHALL BE OF ADEQUATE TYPE, SIZE, AND LENGTH TO BE SECURELY FASTENED TO A METAL WINDOW FRAME. MANUFACTURERS SHALL SUPPLY ALL REQUIRED SCREWS.
K. EACH GUARD SOLD SHALL BE SOLD WITH A SELF-CONTAINED ENVELOPE OR PLASTIC BAG CONTAINING:
   1. APPROVED INSTALLATION INSTRUCTIONS,
   2. APPROVED STOPPING DEVICES, AND
   3. SPECIFIED SCREWS NEEDED FOR INSTALLATION OF THE WINDOW GUARD AND/OR STOPPING DEVICES. IF WOOD SCREWS ARE SUPPLIED BY A MANUFACTURER, A WARNING LABEL OR MESSAGE IMPRINTED ON THE PACKAGING SHALL WARN THAT FOR METAL INSTALLATIONS, APPROPRIATE TYPE, SIZE, AND LENGTH SCREWS MUST BE SUBSTITUTED. THIS WARNING SHALL BE IMPRINTED ON THE PACKAGING CONTAINER.
L. INSTRUCTIONS FOR SAFE INSTALLATION OF WINDOW GUARDS SHALL BE PROVIDED BY THE MANUFACTURER FOR EACH SPECIFIC TYPE OF WINDOW FOR WHICH THEY ARE INTENDED.
   1. INSTRUCTIONS SHALL SPECIFY THAT WINDOW GUARDS MAY NOT BE INSTALLED ON WINDOWS PROVIDING ACCESS TO FIRE ESCAPES.
   2. INSTRUCTIONS SHALL SPECIFY MAXIMUM WINDOW WIDTH AND HEIGHT FOR WHICH GUARD IS INTENDED, AND SHALL CONTAIN THE FOLLOWING PROMINENTLY PRINTED WORDING: **WARNING! USE OF THIS GUARD BEYOND SPECIFIED MAXIMUM WIDTH IS DANGEROUS AND ILLEGAL!**
   3. INSTRUCTIONS SHALL PROMINENTLY WARN THAT GUARDS MUST BE INSTALLED ONLY IN SOUND (NON-ROTTING) MOUNTINGS OR TRACKS.

KEY PLAN



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1		15/08/03	ISSUED TO D.O.B.
issue	rev	date	description

ISSUES/REVISIONS

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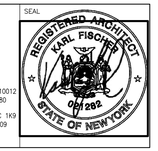
SEAL



project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
GENERAL NOTES

dob no

scale: NTS	project no.: 15-23
date:	sheet no.: x OF
drawn:	drawing no.: G-003.00
checked: KF	

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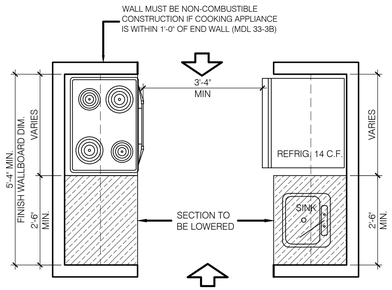
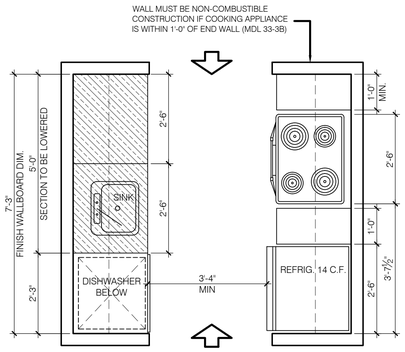
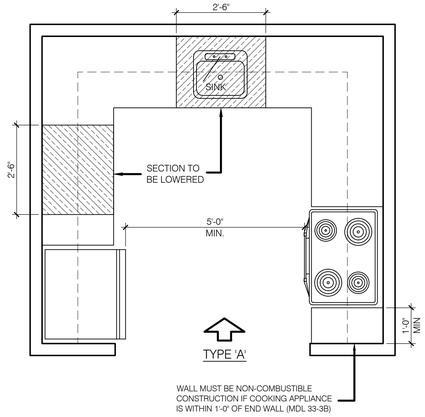
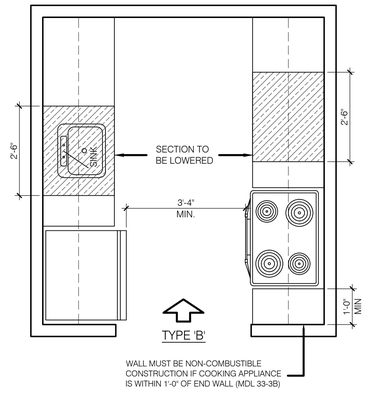


MIN. PERMISSIBLE KITCHEN SIZE

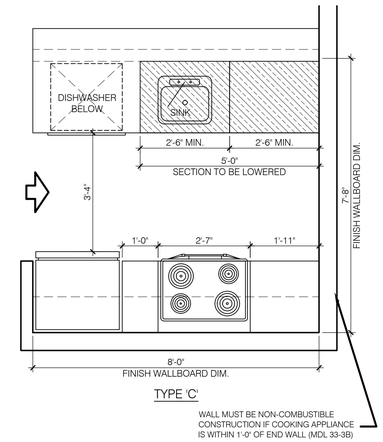


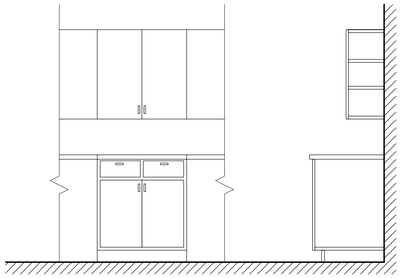
PASS-THROUGH KITCHEN CLEARANCE



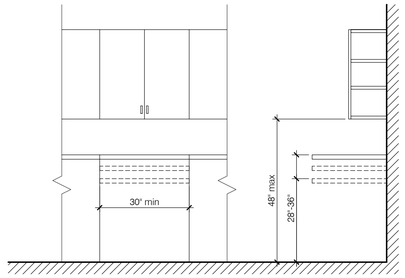


"U" SHAPED KITCHEN CLEARANCE

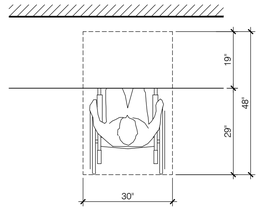




(A) BEFORE REMOVAL OF CABINETS AND BASE

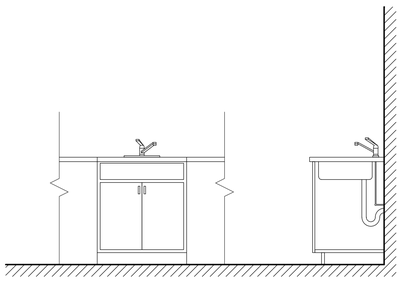


(B) CABINETS AND BASE REMOVED AND HEIGHT ALTERNATIVES

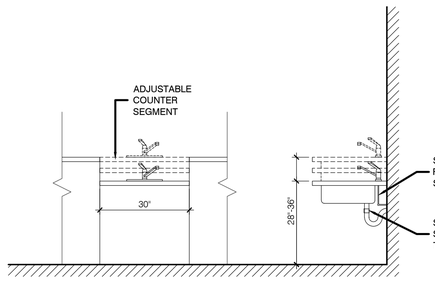


(C) CLEAR FLOOR SPACE UNDER WORK SURFACE

COUNTER WORK SERVICE

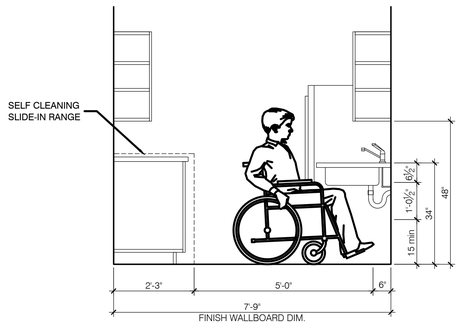


(A) BEFORE REMOVAL OF CABINETS AND BASE

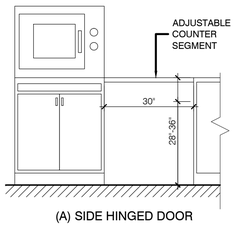


(B) CABINETS AND BASE REMOVED AND HEIGHT ALTERNATIVES

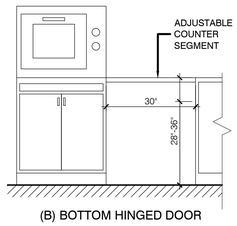
KITCHEN SINK



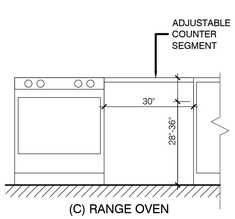
KITCHEN CLEARANCE DIMENSIONS



(A) SIDE HINGED DOOR

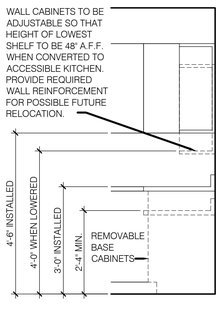


(B) BOTTOM HINGED DOOR

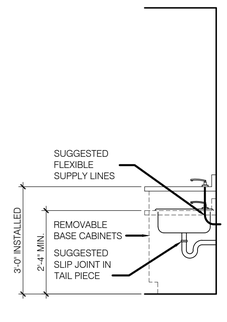


(C) RANGE OVEN

OVENS WITHOUT SELF CLEANING FEATURE



ADAPTABLE KITCHEN LOWERABLE WORK SURFACE
LOWERABLE WALL CABINETS



ADAPTABLE KITCHEN
LOWERABLE SINK COUNTER

ADAPTABLE KITCHENS (CAPABLE OF POSSIBLE FUTURE CONVERSION TO ACCESSIBLE KITCHENS)

GENERAL NOTES:

1. ONE LOWERABLE WORK SURFACE, 30" WIDE, IS REQUIRED, WITH REMOVABLE BASE CABINETS. HEIGHT TO BE ADJUSTABLE BETWEEN 28" AND 36" AFF TO COUNTERTOP.
2. ONE LOWERABLE SINK SURFACE, 30" WIDE, IS REQUIRED, WITH REMOVABLE BASE CABINETS. HEIGHT TO BE ADJUSTABLE BETWEEN 28" AND 36" AFF TO COUNTERTOP.
3. OVENS ARE ASSUMED TO BE SELF-CLEANING TYPE. IF OTHERWISE, PROVIDE A MINIMUM 30" ADJUSTABLE COUNTER SPACE WITH REMOVABLE BASE CABINETS NEXT TO OVEN.
4. A MINIMUM 36" TURNAROUND SPACE UNDER THE COUNTER WITH REMOVABLE BASE CABINETS SHALL BE PROVIDED IN DEEP CLOSED ENDED GALLEY KITCHENS AND OTHER U-SHAPED KITCHENS WHERE THE CLEARANCE BETWEEN CABINETS IS LESS THAN 5'-0". THE MINIMUM CLEARANCE BETWEEN CABINETS SHALL BE 40".
5. 48" A.F.F. WHEN CONVERTED TO ACCESSIBLE KITCHEN. PROVIDE REQUIRED WALL REINFORCEMENT FOR POSSIBLE FUTURE RELOCATION.

GENERAL NOTES:

ACCESSIBLE ROUTE:
A CONTINUOUS UNOBSTRUCTED PATH CONNECTING ALL ACCESSIBLE SPACES AND ROOMS IN A BUILDING THAT CAN BE NEGOTIATED BY ALL CATEGORIES OF PEOPLE HAVING PHYSICAL DISABILITIES.

PORTIONS OF ACCESSIBLE ROUTES WITH SLOPES OF MORE THAN 1:20 ARE RAMPS AND SHALL COMPLY WITH REQUIREMENTS FOR RAMPS.

AN INTERIOR ACCESSIBLE ROUTE SHALL BE PROVIDED FROM THE ENTRANCE OF THE BUILDING TO ALL DWELLING UNITS IN THE BUILDING. ALL DWELLING UNITS ARE TO BE ADAPTABLE.

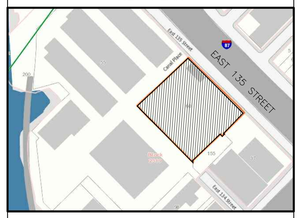
ADAPTABLE DWELLING UNITS:
DWELLING UNITS WHICH ARE CONSTRUCTED ON AN ACCESSIBLE ROUTE AND EQUIPPED AS SET FORTH IN REFERENCE STANDARD RS 4-6 OF THE NYC BUILDING CODE SO THAT THEY CAN BE CONVERTED TO BE USED, WITH A MINIMUM OF STRUCTURAL CHANGE, BY ALL CATEGORIES OF PERSONS HAVING PHYSICAL DISABILITIES.

ALL DOORS TO BE PROVIDED WITH HANDICAP COMPLIANT HARDWARE AND SADDLES AS PER SEC. 4.13, ANSI A117.1. ADAPTABLE DWELLING UNITS SHALL BE EQUIPPED WITH DOOR WIDTHS AND CLEAR FLOOR SPACES FOR POSSIBLE OCCUPANTS WITH PHYSICAL DISABILITIES. ADAPTABLE SPACES WITHIN DWELLING UNITS SHALL INCLUDE KITCHENS AND BATHROOMS AND THEIR RESPECTIVE DOORWAYS.

THE INFORMATION SHOWN ON THIS DRAWING IS FOR GUIDANCE PURPOSES ONLY AND OUTLINE THE MOST COMMON ACCESSIBILITY CRITERIA APPLICABLE TO THIS JOB. THEY DO NOT CONSTITUTE A COMPREHENSIVE DESCRIPTION OF ALL POSSIBLE CRITERIA WHICH ARE GIVEN IN RS 4-6 OF THE NYC BUILDING CODE AND ANSI A1117.1 - 1986 AS MODIFIED BY RS 4-6.

THE GENERAL CONTRACTOR MUST DO ALL WORK IN ACCORDANCE WITH THESE REGULATIONS.

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

ISSUES/REVISIONS

MEP ENGINEER:
TSF ENGINEERING, P.C.
200 PARK AVENUE SOUTH, SUITE 916
NEW YORK, NY 10003.
(212) 253 7303 (TEL) – (212) 253 6512 (FAX)

SRTRUCTURAL ENGINEER:
WEXLER & ASSOCIATES
12 WEST 32ND STREET, 8TH FLOOR NEW YORK, NY 10001
TEL: (212) 643 1500
FAX: (212) 643 2277
www.nwexler.com

INTERIOR DESIGNER:
DURUKAN DESIGN
16 WEST 37TH STREET, 3RD FLOOR NEW YORK, NY 10018
TEL: (212) 596 4041
FAX: (212) 596 4042
email: info@durukandesign.com

CLIENT:
CHESS BUILDERS, LLC
TEL: (718) 522 5512

KARL FISCHER ARCHITECT
OAQ RAIC AIA
530 BROADWAY, 9th FLOOR, NEW YORK, NY 10012
TEL: (212) 219-9733 FAX: (212) 219-8980
1420 NOTRE-DAME WEST, MONTREAL, QC H3C 1K9
TEL: (514) 933-4137 FAX: (514) 933-0409
WEB SITE: WWW.KFARCHITECT.COM
E-MAIL:KARL@KFARCHITECT.COM

SEAL

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ADA NOTES

dob no

scale: NTS	project no.: 15-23
date:	sheet no.: x OF
drawn:	drawing no.: G-004.00
checked: KF	

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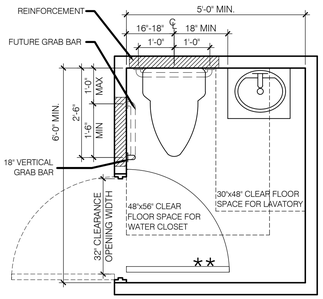
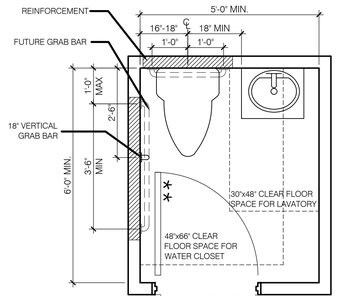


PARALLEL APPROACH



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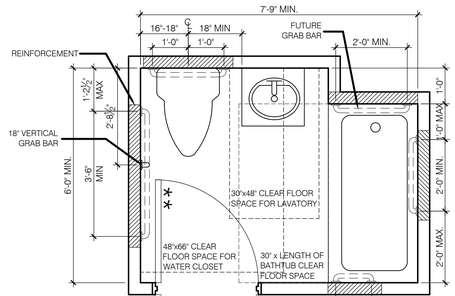

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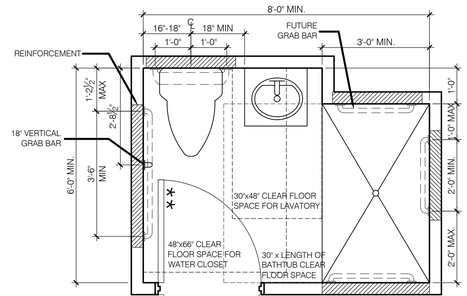
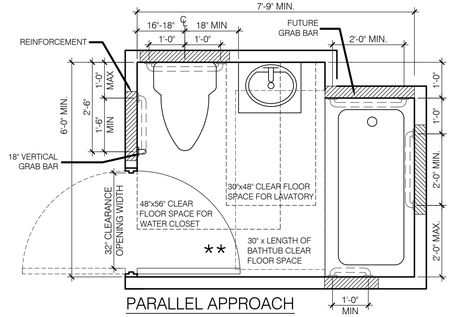


FORWARD APPROACH

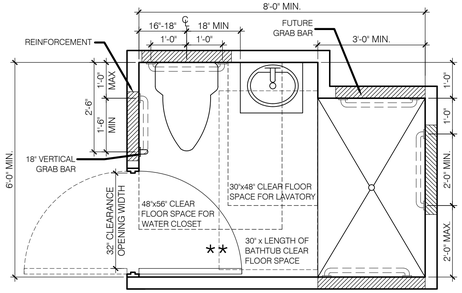
APPENDIX 'P' BATHROOM

** NOTE: DOOR SWING - APPENDIX 'P' TOILET & BATHING FACILITY

THE DOOR & FRAME ARE PROVIDED WITH MORTISED HINGE & LATCH BLANKS TO PERMIT FUTURE REVERSAL OF THE DOOR ON THE SAME FRAMES USING COMMON HAND TOOLS AND WITHOUT FURTHER ALTERATIONS TO THE DOOR & FRAMES. SUCH FUTURE SWING OF THE DOOR SHALL NOT OBSTRUCT THE MANEUVERING CLEARANCES REQUIRED AT THE DOOR OR DOORWAY.



PARALLEL APPROACH



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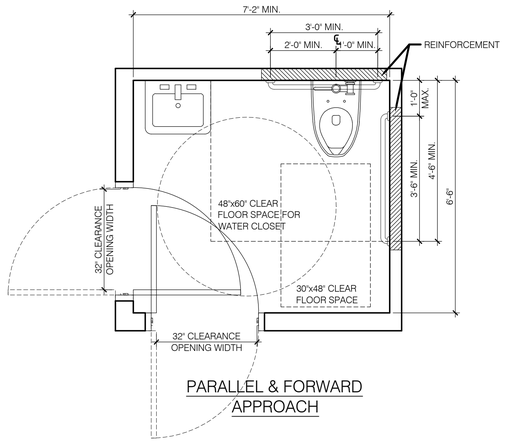
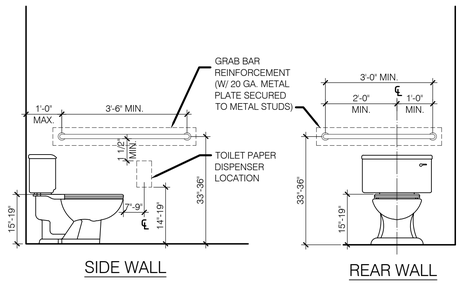


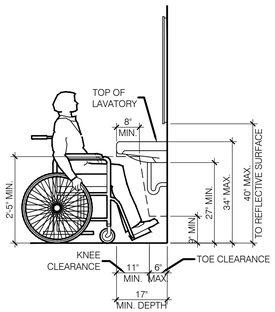
PARALLEL & FORWARD APPROACH



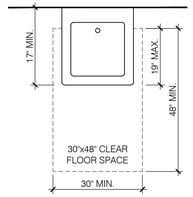
SIDE WALL

REAR WALL

ACCESSIBLE TOILET (INDIVIDUAL USE)

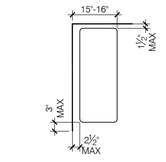


ACCESSIBLE LAVATORY

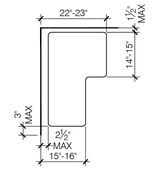


NOTE:GRAB BAR IN ACCESSIBLE TOILET FACILITY ALL REINFORCEMENT & GRAB BARS ARE REQUIRED FOR ACCESSIBLE TOILET FACILITY

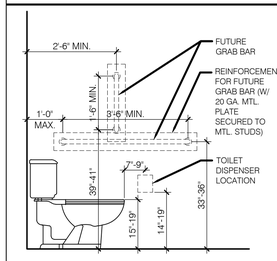
ACCESSIBLE BATHROOM



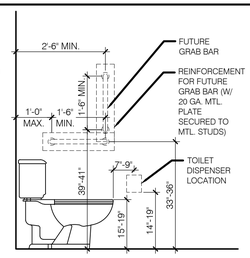
RECTANGULAR SHOWER COMPARTMENT SEAT



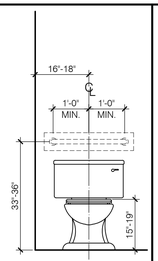
L-SHAPE SHOWER COMPARTMENT SEAT



SIDE WALL - TYPE 'A'

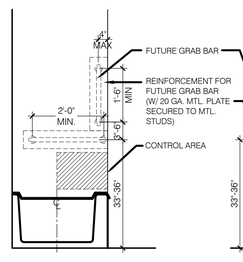


SIDE WALL - TYPE 'B'
(EXCEPTION FOR SIDE WALL THAT CANNOT ACCOMODATE A 42" GRAB BAR)

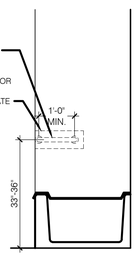


REAR WALL

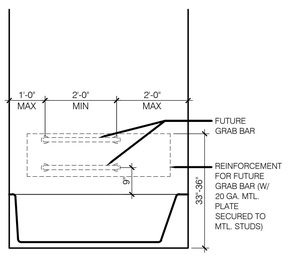
WATER CLOSET



CONTROL END WALL

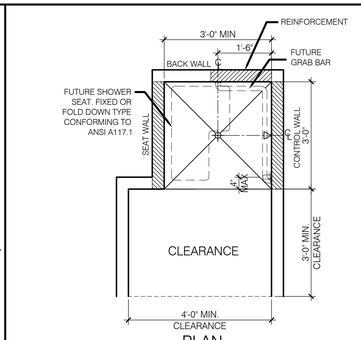


END WALL

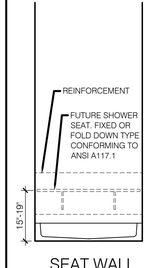


BACK WALL

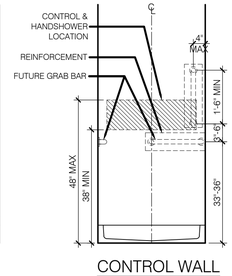
TRANSFER-TYPE SHOWER STALL



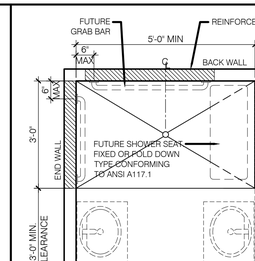
PLAN



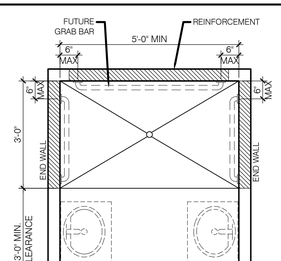
SEAT WALL



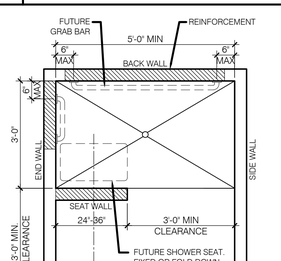
CONTROL WALL



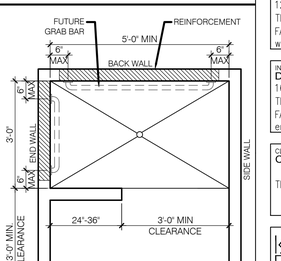
W/ SEAT



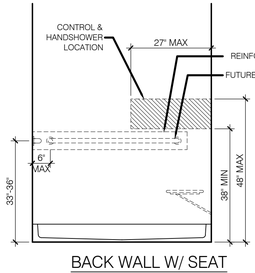
W/O SEAT



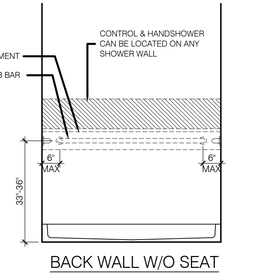
W/ SEAT



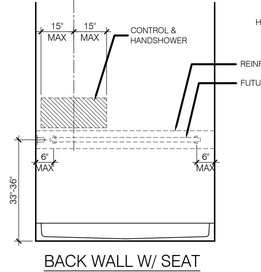
W/O SEAT



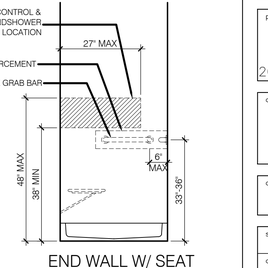
BACK WALL W/ SEAT



BACK WALL W/O SEAT



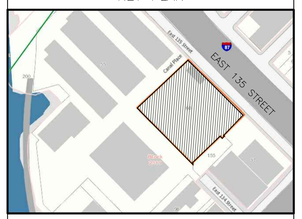
BACK WALL W/ SEAT

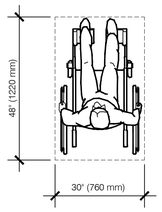


END WALL W/ SEAT

STANDARD ROLL IN TYPE SHOWER COMPARTMENT

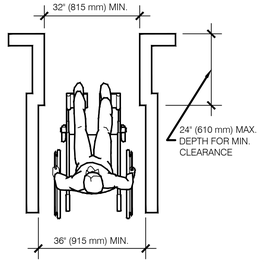
KEY PLAN


EAST 135 STREET
Cedar Point Park
Cedar Point Park
Cedar Point Park

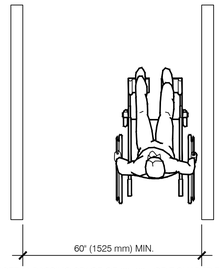


CLEAR FLOOR SPACE
FOR SINGLE WHEELCHAIR

NOTE:
32 in. clearance min. is allowed on the accessible route only at doorways.

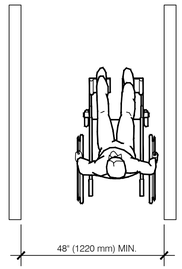


MIN. CLEAR WIDTH
FOR SINGLE WHEELCHAIR

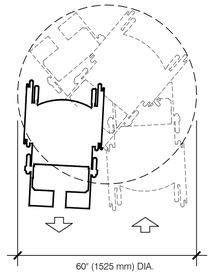


NOTE: A PASSING SPACE OF 60'x60' , OR T SHAPED TURING SPACE, SHALL BE PROVIDED AT INTERVALS OF 200'.

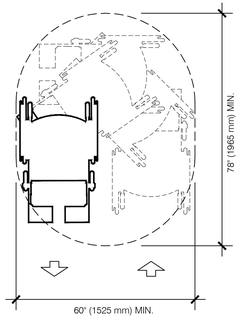
MIN. CLEAR WIDTH
FOR TWO WHEELCHAIRS



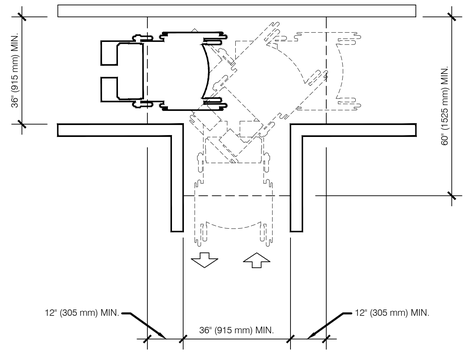
MIN. CLEAR WIDTH
FOR ONE WHEELCHAIR AND
ONE AMBULATORY PERSON



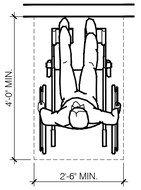
SPACE NEEDED TO
TURN A WHEELCHAIR



SPACE NEEDED
FOR SMOOTH U-TURN



T-SHAPED SPACE FOR 180° TURN



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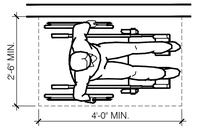
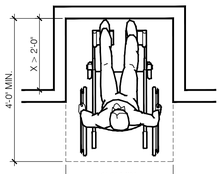
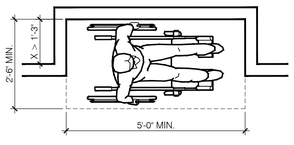


PARALLEL

POSITION OF CLEAR FLOOR SPACE



FORWARD APPROACH



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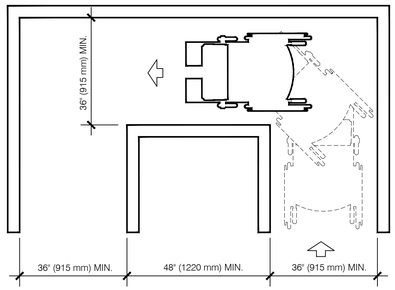
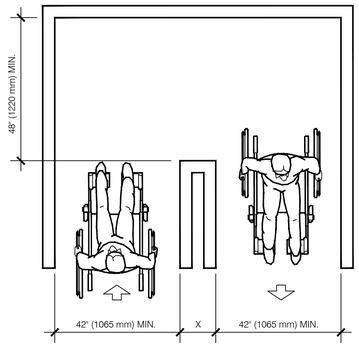
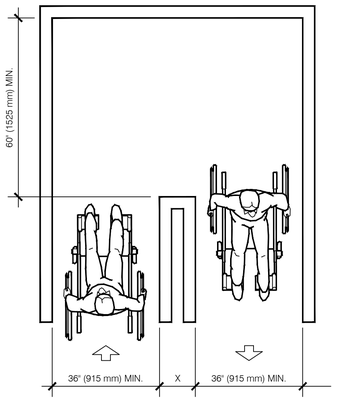


90° WHEELCHAIR TURN



NOTE: Dimensions shown apply when x < 48 in. (1220 mm).

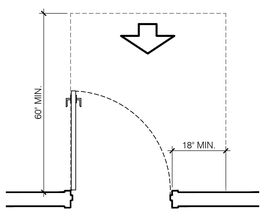
180 DEGREE TURN



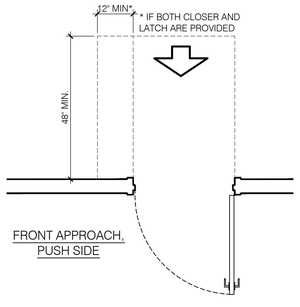
NOTE: Dimensions shown apply when x < 48 in. (1220 mm).

180 DEGREE TURN (Exception)

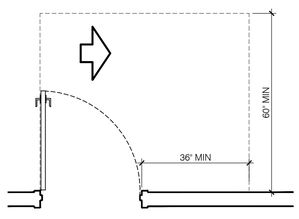
CLEAR WIDTH AT TURN



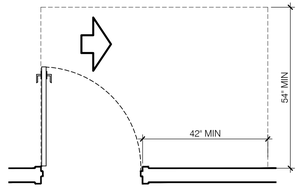
FRONT APPROACH,
PULL SIDE



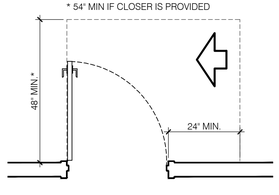
FRONT APPROACH,
PUSH SIDE



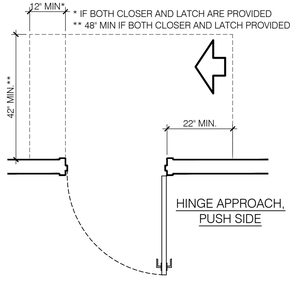
HINGE APPROACH,
PULL SIDE



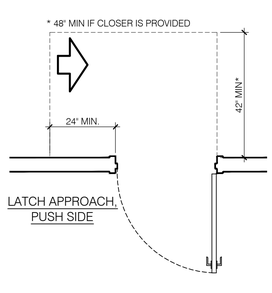
HINGE APPROACH,
PULL SIDE



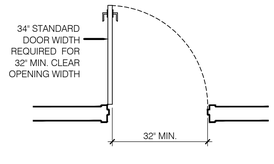
LATCH APPROACH,
PULL SIDE



HINGE APPROACH,
PUSH SIDE

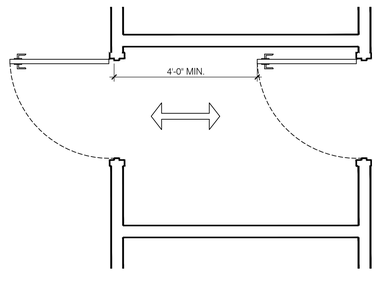


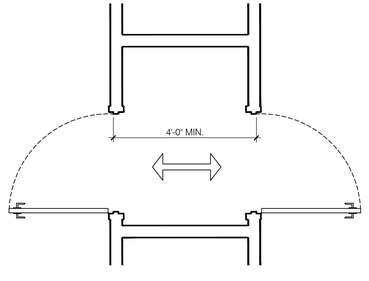
LATCH APPROACH,
PUSH SIDE

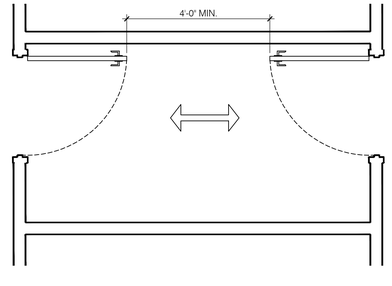


CLEAR OPENING WIDTH
SWINGING DOOR

MANEUVERING CLEARANCES AT MANUAL SWINGING DOORS AND GATES

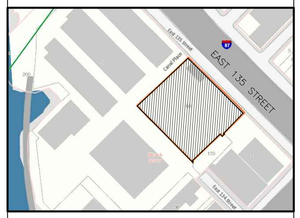






DOORS IN SERIES AND GATES IN SERIES

KEY PLAN



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1		15/08/03	ISSUED TO D.O.B.
issue	rev	date	description

ISSUES/REVISIONS

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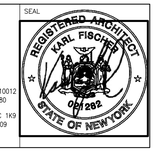
SEAL



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DEVELOPMENT
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drawing title
ADA NOTES

dob no

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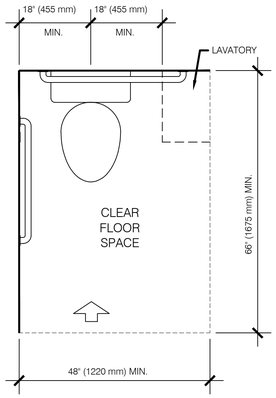
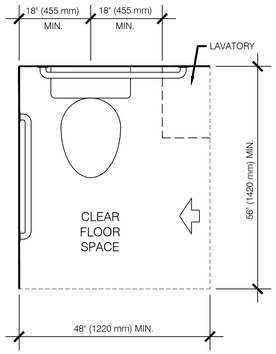
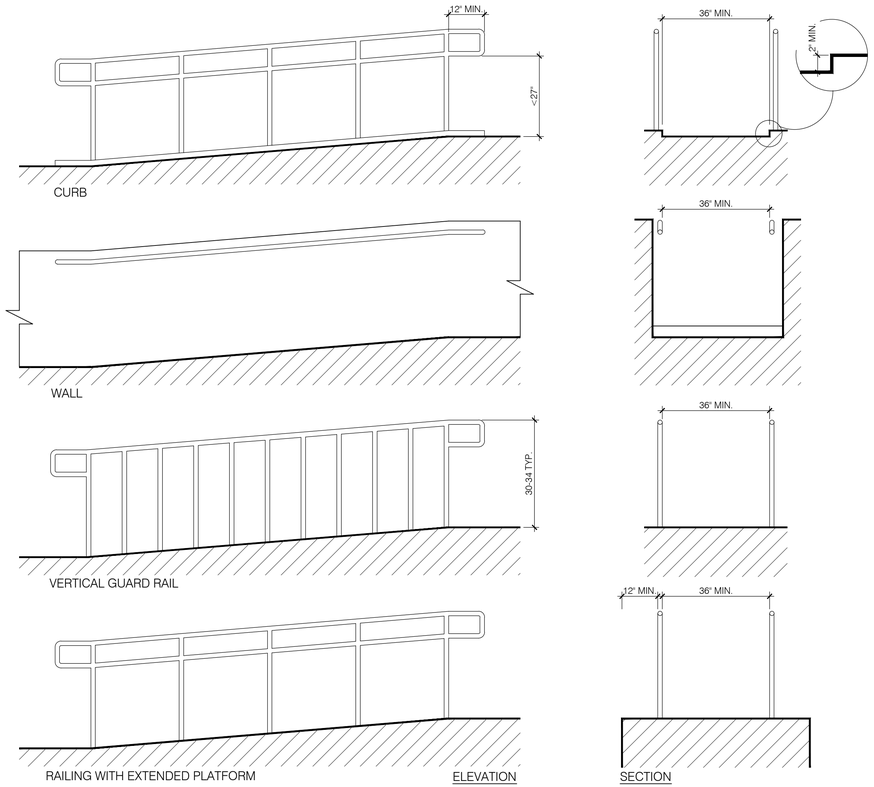
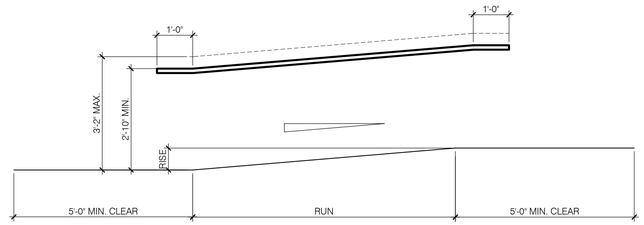




CLEAR FLOOR SPACE AT WATER CLOSETS

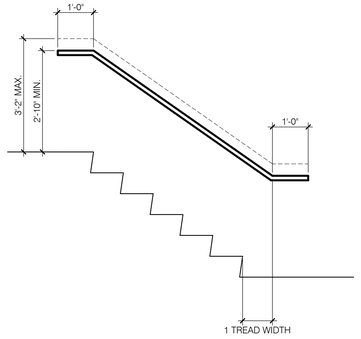


EXAMPLES OF EDGE PROTECTION & HANDRAIL EXTENSIONS

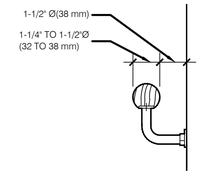


SLOPE	MAXIMUM RISE	MAXIMUM RUN
1:12 TO 1:15	30 INCHES	30 FEET
1:16 TO 1:19	30 INCHES	40 FEET
1:20	30 INCHES	50 FEET

RAMP REQUIREMENTS

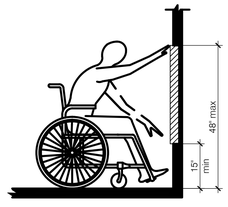


HANDRAIL REQUIREMENTS FOR STAIRS

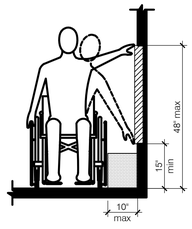


HANDRAIL REQUIREMENTS
(WALL MOUNTED)

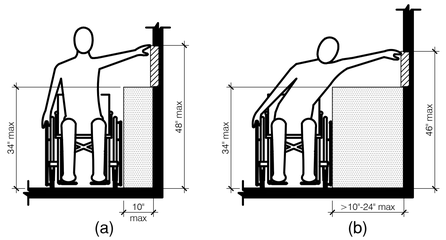
REACH RANGES



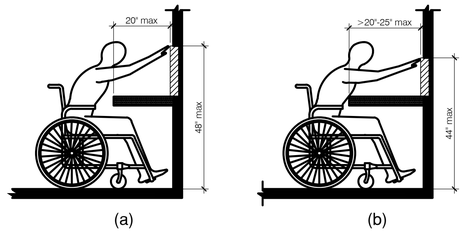
UNOBSTRUCTED FORWARD REACH



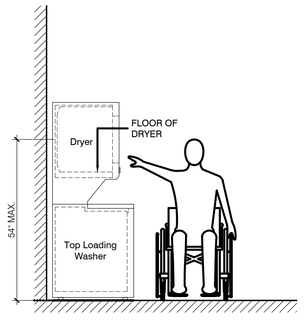
UNOBSTRUCTED SIDE REACH



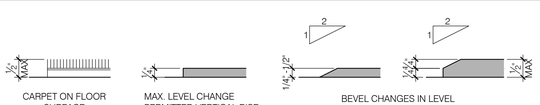
OBSTRUCTED HIGH SIDE REACH



OBSTRUCTED HIGH FORWARD REACH



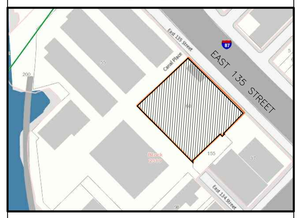
STACKED WASHER/DRYER UNIT WITH
DRYER AND ALL CONTROLS WITHIN REACH
RANGE OF SEATED USER



FOR VERTICAL RISE GREATER THAN 1", RAMP MUST BE PROVIDED.
MAX. SLOPE 1:20, ELSE REQUIRES HANDRAILS.

HEIGHT CHANGES AND FLOOR SADDLES

KEY PLAN



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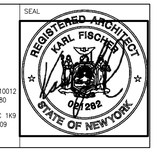

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200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ADA NOTES

dob no

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ICC/ANSI A117.1- 2003 & ASME/ANSI 17.1-2000 NOTES:

407 ELEVATORS

407.1 GENERAL. ELEVATORS SHALL COMPLY WITH SECTION 407 AND ASME A17.1 LISTED IN SECTION 105.2.5. ELEVATORS SHALL BE PASSENGER ELEVATORS AS CLASSIFIED BY ASME A17.1. ELEVATOR OPERATION SHALL BE AUTOMATIC.

407.2.1 CALL CONTROLS. CALL BUTTONS SHALL BE RAISED OR FLUSH. OBJECTS BENEATH HALL CALL BUTTONS SHALL PROTRUDE 1 INCH MAXIMUM. CALL BUTTONS AND KEYPADS SHALL BE LOCATED 15-48" ABOVE THE GROUND MEASURED TO THE CENTER LINE OF THE HIGHEST OPERABLE POINT. CALL BUTTONS SHALL BE .75" INCH MINIMUM IN THE SMALLEST DIMENSION. A CLEAR FLOOR SPACE OF 30" X 48" MINIMUM SHALL BE PROVIDED AT ALL CALL CONTROLS. THE CALL BUTTON THAT DESIGNATES THE UP DIRECTION SHALL BE LOCATED ABOVE THE CALL BUTTON THAT DESIGNATES THE DOWN DIRECTION. CALL BUTTONS SHALL HAVE VISIBLE SIGNALS TO INDICATE WHEN EACH CALL IS REGISTERED AND WHEN EACH CALL IS ANSWERED.

407.2.2 HALL SIGNALS. A VISUAL AND AUDIBLE SIGNAL SHALL BE PROVIDED AT EACH HOISTWAY ENTRANCE TO INDICATE WHICH CAR IS ANSWERING A CALL AND THE CARS' DIRECTION OF TRAVEL. WHERE IN-CAR SIGNALS ARE PROVIDED THEY SHALL BE VISIBLE FROM THE FLOOR AREA ADJACENT TO THE HALL CALL BUTTONS. VISIBLE SIGNAL FIXTURES SHALL BE CENTERED AT 72" MINIMUM ABOVE THE FLOOR. THE VISUAL SIGNAL ELEMENTS SHALL BE 2.5 INCHES MINIMUM MEASURED ALONG THE VERTICAL CENTERLINE OF THE ELEMENT. SIGNALS SHALL BE VISIBLE FROM THE FLOOR AREA ADJACENT TO THE HALL CALL BUTTON. AUDIBLE SIGNALS SHALL SOUND ONCE FOR THE UP DIRECTION AND TWICE FOR THE DOWN DIRECTION AT MAXIMUM FREQUENCY OF 1500 HZ, OR SHALL HAVE VERBAL ANNUNCIATORS THAT STATE THE WORD "UP" OR "DOWN" BETWEEN A FREQUENCY OF 300 AND 3,000 HZ. THE AUDIBLE SIGNAL OR VERBAL ANNUNCIATOR SHALL BE 10 DBA MINIMUM ABOVE AMBIENT BUT SHALL NOT EXCEED 80 DBA, MEASURED AT THE HALL CALL BUTTON.

407.2.3 HOISTWAY SIGNS. FLOOR DESIGNATIONS SHALL BE PROVIDED IN TACTILE CHARACTERS LOCATED ON BOTH JAMBS OF THE ELEVATOR HOISTWAY ENTRANCES. TACTILE CHARACTERS SHALL BE 2" MINIMUM IN HEIGHT. A TACTILE STAR SHALL BE PROVIDED ON BOTH JAMBS AT THE MAIN ENTRY LEVEL.

407.3.2 ELEVATOR DOORS SHALL BE HORIZONTAL SLIDING TYPE. CAR GATES SHALL BE PROHIBITED. ELEVATOR HOISTWAY AND CAR DOORS SHALL OPEN AND CLOSE AUTOMATICALLY.

407.3.3 REOPENING DEVICE. ELEVATOR DOORS SHALL BE PROVIDED WITH A REOPENING DEVICE COMPLYING WITH SECTION 703.3 OF ANSI A117.1 THAT SHALL STOP AND REOPEN A CAR DOOR AND HOISTWAY DOOR AUTOMATICALLY IF THE DOOR BECOMES OBSTRUCTED BY AN OBJECT OR PERSON. THE REOPENING DEVICE SHALL REMAIN EFFECTIVE FOR 20 SECONDS MINIMUM.

407.3.4 DOOR AND SIGNAL TIMING. THE MINIMUM ACCEPTABLE TIME FROM THE NOTIFICATION THAT A CAR IS ANSWERING A CALL UNTIL THE DOORS OF THAT CAR START TO CLOSE SHALL BE CALCULATED FROM THE FOLLOWING EQUATION:

T = D/(1.5 FT/S) OR T = D/ (455MM/S) = 5 SECONDS MINIMUM.

WHERE T = THE TOTAL TIME IN SECONDS AND D = THE DISTANCE (IN FEET OR MILLIMETERS) FROM THE POINT IN THE LOBBY OR CORRIDOR 60 INCHES DIRECTLY IN FRONT OF THE FARTHEST CALL BUTTON CONTROLLING THAT CAR TO THE CENTERLINE OF THE DOOR.

407.3.5 DOOR DELAY. ELEVATOR DOORS SHALL REMAIN FULLY OPEN IN RESPONSE TO A CAR CALL FOR 3 SECONDS MINIMUM.

407.4.1 CAR DIMENSIONS. INSIDE OF CAR DIMENSIONS SHALL COMPLY WITH TABLE 407.4.1 AS MODIFIED BY BC 3002.4 STATING THE MINIMUM INSIDE DIMENSIONS OF ELEVATOR CARS SHALL ACCOMMODATE A 24" BY 76" HOSPITAL STRETCHER.

407.4.2 FLOOR SURFACES IN ELEVATORS SHALL BE STABLE, FIRM, AND SLIP RESISTANT AND SHALL COMPLY WITH SECTION 302 OF ICC/ANSI A117.1.

407.4.5 ILLUMINATION. THE LEVEL OF ILLUMINATION AT THE CAR CONTROLS, PLATFORM, CAR THRESHOLD AND CAR LANDING SILL SHALL BE A 5 FOOT-CANDLES (54 LUX) MINIMUM.

407.4.6 ELEVATOR CAR CONTROLS. CONTROLS SHALL BE LOCATED 15-48" ABOVE THE GROUND MEASURED TO THE CENTER LINE OF THE HIGHEST OPERABLE POINT. EXCEPTION WHERE THE ELEVATOR SERVES MORE THAN 16 OPENINGS AND A PARALLEL APPROACH TO THE CONTROLS IS PROVIDED, IN WHICH CASE BUTTONS WITH FLOOR DESIGNATIONS SHALL BE PERMITTED TO BE 54 INCHES MAXIMUM ABOVE THE FLOOR.

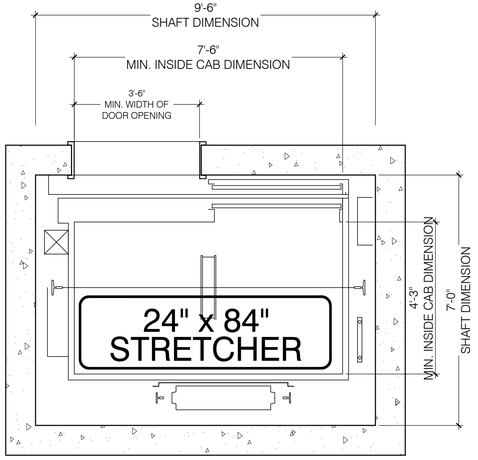
407.4.6.2 CAR CONTROL BUTTONS WITH FLOOR DESIGNATIONS SHALL BE RAISED OR FLUSH, AND 3/4 INCH MINIMUM IN THEIR SMALLEST DIMENSION. BUTTONS SHALL BE ARRANGED IN ASCENDING ORDER. WHEN TWO OR MORE COLUMNS OF BUTTONS ARE PROVIDED THEY SHALL BE READ FROM LEFT TO RIGHT.

407.4.6.4 EMERGENCY CONTROLS. EMERGENCY CONTROL BUTTONS SHALL HAVE THEIR CENTERLINES 35 INCHES MINIMUM ABOVE THE FLOOR. EMERGENCY CONTROLS, INCLUDING THE EMERGENCY ALARM SHALL BE GROUPED AT THE BOTTOM OF THE PANEL.

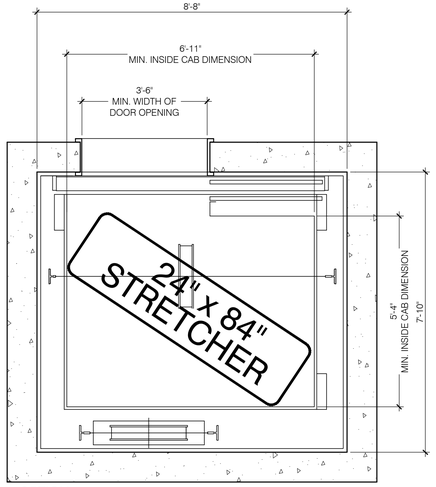
407.4.7 DESIGNATIONS AND INDICATORS OF CAR CONTROLS. CONTROL BUTTONS SHALL BE IDENTIFIED BY TACTILE CHARACTERS COMPLYING WITH SECTION 703.3. TACTILE CHARACTER AND BRAILLE DESIGNATIONS SHALL BE PLACED IMMEDIATELY TO THE LEFT OF THE CONTROL BUTTON TO WHICH THE DESIGNATIONS APPLY. BUTTONS WITH FLOOR DESTINATIONS SHALL BE PROVIDED WITH VISIBLE INDICATORS TO SHOW THAT A CALL HAS BEEN REGISTERED. THE VISIBLE INDICATION SHALL EXTINGUISH WHEN THE CAR ARRIVES AT THE DESIGNATED FLOOR.

407.4.9 CAR POSITION INDICATORS. AUDIBLE AND VISIBLE CAR POSITION INDICATORS SHALL BE PROVIDED IN ELEVATOR CARS. VISIBLE INDICATORS SHALL BE LOCATED ABOVE THE CAR CONTROL PANELS OR ABOVE THE DOOR; CHARACTERS SHALL BE 1/2 INCH HIGH MINIMUM IN HEIGHT. AS THE CAR PASSES A FLOOR AND WHEN A CAR STOPS AT A FLOOR SERVED BY THE ELEVATOR, THE CORRESPONDING CHARACTER SHALL ILLUMINATE. AUDIBLE INDICATORS SHALL SIGNAL AS AN AUTOMATIC VERBAL ANNUNCIATOR THE ANNOUNCES THE FLOOR AT WHICH THE CAR IS ABOUT TO STOP; THE VERBAL ANNOUNCEMENT INDICATING THE FLOOR SHALL BE COMPLETED PRIOR TO THE INITIATION OF THE DOOR OPENING. THE VERBAL ANNUNCIATOR SHALL BE 10 DBA MINIMUM ABOVE AMBIENT BUT SHALL NOT EXCEED 80 DBA, MEASURED AT THE ANNUNCIATOR.

407.4.10 EMERGENCY COMMUNICATIONS. EMERGENCY TWO WAY COMMUNICATION SYSTEMS BETWEEN THE ELEVATOR CAR AND A POINT OUTSIDE THE HOISTWAY SHALL COMPLY WITH SECTION 407.4.10 AND ASME/ANSI A17.1 LISTED IN SECTION 105.2.5. THE MIDPOINT OF THE HIGHEST OPERABLE PART OF A TWO WAY COMMUNICATION SYSTEM SHALL NOT EXCEED 48 INCHES; TACTILE CHARACTERS AND SYMBOLS SHALL BE PROVIDED ADJACENT TO THE DEVICE IN COMPLIANCE WITH SECTIONS 703.3 AND 407.4.7.1.3 OF ICC/ANSI A117.1-2003.



OPTION 1

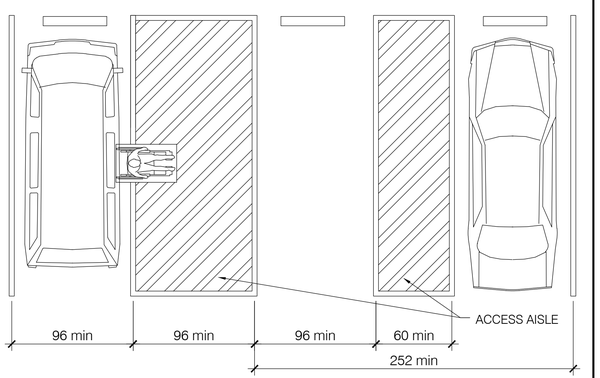


OPTION 2

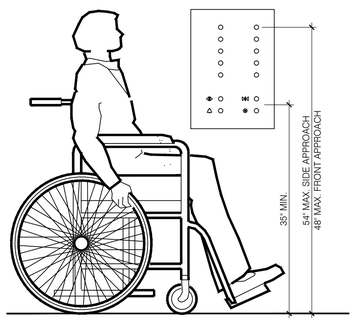
TYPICAL ADA ELEVATOR PLAN

NOTE

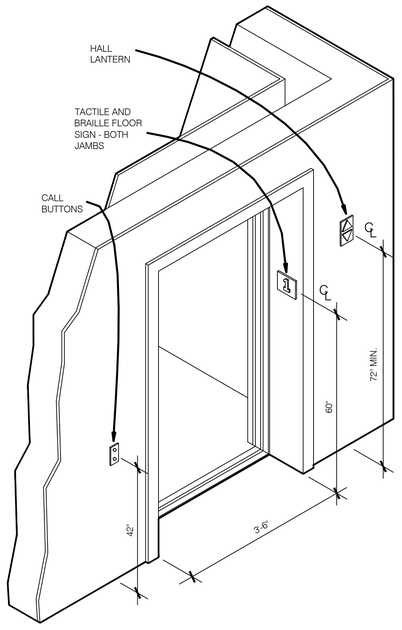
AT LEAST ONE ELEVATOR IN EACH BANK TO BE STRETCHER ACCESSIBLE WITH 24 X 84 CLEAR SPACE AND CLEAR OF HANDRAIL AND 3500 LB. CAPACITY TO MEET 2014 NYC BUILDING CODE



DIMENSIONS OF PARKING SPACES



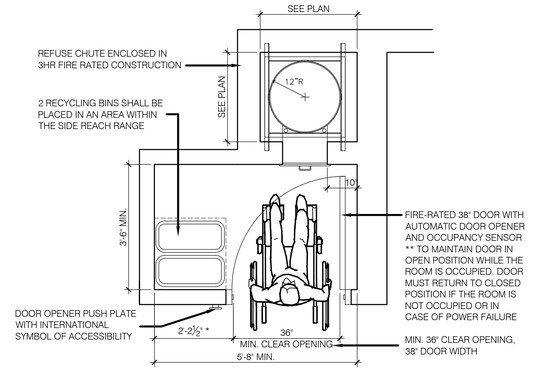
ELEVATOR REQUIREMENTS



ACCESSIBLE COMMON-USE REFUSE DISPOSAL/STORAGE ROOM NOTES:

COMMON-USE REFUSE DISPOSAL/STORAGE ROOM THAT ARE REQUIRED TO BE ACCESSIBLE PURSUANT TO NYC B.C. CHAPTER 11 SECTION 1107 AND ICC/ANSI117.1., BUT NOT LIMITED TO, WHEELCHAIR TURNING SPACE, CLEAR FLOOR OR GROUND SPACE FOR WHEELCHAIRS, AND MANEUVERING CLEARANCES AT THE DOOR PROVIDED THE FOLLOWING:

1. THE REFUSE DISPOSAL/STORAGE ROOM SHALL BE DESIGNED SO THAT THE WHEELCHAIR USER CAN ENTER THE ROOM HEAD ON, AND BACK OUT WITHOUT TURNING OR CHANGING DIRECTION, NYC DEPARTMENT OF BUILDINGS MEMO DATED JULY 3, 2007
2. THE REFUSE DISPOSAL/STORAGE ROOM SHALL BE PROVIDED WITH MANEUVERING CLEARANCE INCLUDING A MINIMUM OF 36" CLEAR WIDTH AT THE DOORWAY FOR A FORWARD APPROACH AS PER ICC/ANSI117.1. SUCH CLEAR WIDTH AT THE DOOR SHALL BE MEASURED BETWEEN THE FACE OF THE DOOR AND STOP, WITH THE DOOR OPEN 90 DEGREES. THIS WILL TYPICALLY REQUIRE A 38" WIDE DOOR.
3. THE DOOR OF THE REFUSE DISPOSAL/STORAGE ROOM SHALL COMPLY WITH ICC/ANSI117.1 (MANEUVERING CLEARANCES AT DOORS) EXCEPT SUCH CLEARANCE IS NOT REQUIRED INSIDE THE REFUSE DISPOSAL/STORAGE ROOM. THRESHOLDS AT THE DOORWAY SHALL COMPLY WITH ICC/ANSI117.1.
4. THE DOOR OF THE REFUSE DISPOSAL/STORAGE ROOM SHALL BE A FULL POWERED AUTOMATIC DOOR COMPLYING WITH ICC/ANSI117.1. CONTROLS FOR THE AUTOMATIC DOOR SHALL BE PROVIDED WITHIN THE REACH RANGE PERMITTED IN ICC/ANSI117.1 AND SHALL BE LOCATED ALONGSIDE THE DOOR AT THE LATCH SIDE. ROOM IDENTIFICATION AND SYMBOL OF ACCESSIBILITY SHALL BE PROVIDED NEAR THE CONTROL AND SHALL COMPLY WITH ICC/ANSI117.1.
5. AN OCCUPANCY SENSOR SHALL BE PROVIDED IN THE REFUSE DISPOSAL/STORAGE ROOM TO DETECT THE PRESENCE AND THE ABSENCE OF OCCUPANTS. UPON THE DETECTION OF AN OCCUPANT IN THE ROOM, THE DOOR SHALL BE MAINTAINED IN THE OPEN POSITION DURING THE ENTIRE PERIOD OF OCCUPANCY OF THE ROOM. UPON THE ABSENCE OF AN OCCUPANT IN THE ROOM, THE DOOR SHALL AUTOMATICALLY RETURN TO THE CLOSED POSITION.
6. THE AUTOMATIC DOOR OF THE REFUSE DISPOSAL/STORAGE ROOM SHALL RETURN TO THE CLOSED POSITION IN THE CASE OF POWER FAILURE, UPON THE ACTIVATION OF THE FIRE ALARM SYSTEMS (IF A FIRE ALARM SYSTEM IS PROVIDED IN THE BUILDING), OR UPON THE ACTIVATION OF SMOKE DETECTORS.
7. THE REFUSE DISPOSAL/STORAGE ROOM SHALL BE PROVIDED WITH A FIRE-RATED DOOR THAT REMAINS CLOSED DURING PERIODS OF NON USE. THE PLACEMENT OF THE STORAGE BINS AND/OR SHELVES AND THE LOCATION OF THE REFUSE CHUTE ACCESS OPENING SHALL COMPLY WITH THE REACH RANGES OF ICC/ANSI117.1.
8. ALL CONTROLS AND OPERATING MECHANISMS SHALL COMPLY WITH ICC/ANSI117.1.



** THE OCCUPANCY SENSOR MAY BE:
1. WEIGHT-SENSITIVE FLOOR MAT
2. INFRARED SENSOR
3. OTHER EQUIVALENT TECHNOLOGY

* VARIABLE DIMENSION. MUST BE OF SUFFICIENT SIZE TO ACCOMMODATE 2 DIFFERENT RECYCLING BINS AND BE WITHIN THE SIDE REACH RANGE

TYPICAL REFUSE DISPOSAL ROOM PLAN

ICC/ANSI A117.1- 2003 COMMON LAUNDRY ROOM NOTES:

CHAPTER 6. PLUMBING ELEMENTS AND FACILITIES

611 WASHING MACHINES AND CLOTHES DRYERS

611.1 GENERAL. ACCESSIBLE WASHING MACHINES AND CLOTHES DRYERS SHALL COMPLY WITH SECTION 611.

611.2 CLEAR FLOOR SPACE. A CLEAR FLOOR SPACE COMPLYING WITH SECTION 305, POSITIONED FOR PARALLEL APPROACH, SHALL BE PROVIDED. THE CLEAR FLOOR SPACE SHALL BE CENTERED ON THE APPLIANCE.

611.3 OPERABLE PARTS. OPERABLE PARTS, INCLUDING DOORS, LINT SCREENS, DETERGENT AND BLEACH COMPARTMENTS, SHALL COMPLY WITH SECTION 309.

611.4 HEIGHT. TOP LOADING MACHINES SHALL HAVE THE DOOR TO THE LAUNDRY COMPARTMENT 36 INCHES (915 mm) MAXIMUM ABOVE THE FLOOR. FRONT LOADING MACHINES SHALL HAVE THE BOTTOM OF THE OPENING TO THE LAUNDRY COMPARTMENT 15 INCHES (380 mm) MINIMUM AND 34 INCHES (865 mm) MAXIMUM ABOVE THE FLOOR.

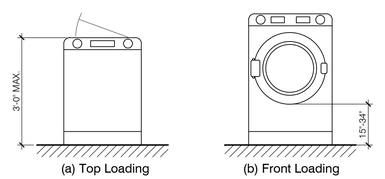


Fig. 611.4

HEIGHT OF LAUNDRY EQUIPMENT

CHAPTER 9. BUILT-IN FURNISHINGS AND EQUIPMENT

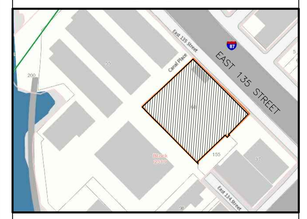
902 DINING SURFACES AND WORK SURFACES

902.1 GENERAL. ACCESSIBLE DINING SURFACES AND WORK SURFACES SHALL COMPLY WITH SECTION 902.

902.2 CLEAR FLOOR SPACE. CLEAR FLOOR SPACE COMPLYING WITH SECTION 305, POSITIONED FOR A FORWARD APPROACH, SHALL BE PROVIDED. KNEE AND TOE CLEARANCE COMPLYING WITH SECTION 306 SHALL BE PROVIDED.

902.3 HEIGHT. THE TOPS OF DINING SURFACES AND WORK SURFACES SHALL BE 28 INCHES (710 mm) MINIMUM AND 34 INCHES (865 mm) MAXIMUM IN HEIGHT ABOVE THE FLOOR.

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

ISSUES/REVISIONS

MEP ENGINEER:
TSF ENGINEERING, P.C.
200 PARK AVENUE SOUTH, SUITE 916
NEW YORK, NY 10003.
(212) 253 7303 (TEL) – (212) 253 6512 (FAX)

STRUCTURAL ENGINEER:
WEXLER & ASSOCIATES
12 WEST 32ND STREET, 8TH FLOOR NEW YORK, NY 10001
TEL: (212) 643 1500
FAX: (212) 643 2277
www.nwexler.com

INTERIOR DESIGNER:
DURUKAN DESIGN
16 WEST 37TH STREET, 3RD FLOOR NEW YORK, NY 10018
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CHESS BUILDERS, LLC
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KARL FISCHER ARCHITECT
OAQ RAIC AIA
530 BROADWAY, 9th FLOOR, NEW YORK, NY 10012
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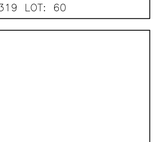
SEAL



project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ADA NOTES

dob no

scale	NTS	project no.	15-23
date		sheet no.	x OF
drawn		drawing no.	G-008.00
checked	KF		

COMcheck Software Version 4.0.0

Envelope Compliance Certificate

Project Information

Energy Code:	90.1 (2007) Standard
Project Title:	New Residential Development
Location:	Queens County, New York
Climate Zone:	4a
Project Type:	New Construction
Vertical Glazing / Wall Area:	43%

Construction Site:
1326 Ocean avenue
Brooklyn, NY 11230

Owner/Agent:

Designer/Contractor:
Karl Fischer
Karl Fischer Architect
530 Broadway, 9th Floor
New York, NY 10012
212 219 9733

Building Area	Floor Area
1-Multifamily : Nonresidential	407664
2-commercial (Retail) : Nonresidential	6210

Envelope Assemblies

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor[a]
MainRoof: Insulation Entirely Above Deck, [Bldg. Use 1 - Multifamily]	6251	---	20.0	0.048	0.048
Roof - Terrace 25th floor: Insulation Entirely Above Deck, [Bldg. Use 1 - Multifamily]	1292	---	20.0	0.048	0.048
Roof - Terrace 24th floor: Insulation Entirely Above Deck, [Bldg. Use 1 - Multifamily]	2006	---	20.0	0.048	0.048
Roof - Terrace 23th floor: Insulation Entirely Above Deck, [Bldg. Use 1 - Multifamily]	2199	---	20.0	0.048	0.048
Roof - Terrace 22th floor: Insulation Entirely Above Deck, [Bldg. Use 1 - Multifamily]	3028	---	20.0	0.048	0.048
Roof - Terrace 13th floor: Insulation Entirely Above Deck, [Bldg. Use 1 - Multifamily]	1793	---	20.0	0.048	0.048
Roof - Terrace 3rd floor: Insulation Entirely Above Deck, [Bldg. Use 1 - Multifamily]	13422	---	20.0	0.048	0.048
NORTH					
Exterior Wall - BRICK - NORTH: Steel-Framed, 16" o.c., [Bldg. Use 1 - Multifamily]	33820	15.0	10.0	0.054	0.064
Window 1: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	2320	---	---	0.420	0.550
Window 2: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	89	---	---	0.420	0.550
Window 3: Metal Frame with Thermal Break, Perf. Specs.: Product ID	310	---	---	0.420	0.550

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor[a]
NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)					
Window 4: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	684	---	---	0.420	0.550
Window 5: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	66	---	---	0.420	0.550
Window 6: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	14	---	---	0.420	0.550
Window 7: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	124	---	---	0.420	0.550
Window 8: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	51	---	---	0.420	0.550
Window 9: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	30	---	---	0.420	0.550
Window 10: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	36	---	---	0.420	0.550
Window 11: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	35	---	---	0.420	0.550
Window 12 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.65, [Bldg. Use 1 - Multifamily] (b)	888	---	---	0.420	0.550
Window 12a - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.59, [Bldg. Use 1 - Multifamily] (b)	242	---	---	0.420	0.550
Window 13: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	81	---	---	0.420	0.550
Window 14 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.53, [Bldg. Use 1 - Multifamily] (b)	6	---	---	0.420	0.550
Window 15 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.53, [Bldg. Use 1 - Multifamily] (b)	14	---	---	0.420	0.550
Door 1: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	364	---	---	0.420	0.550
Door 2 - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.55, [Bldg. Use 1 - Multifamily] (b)	729	---	---	0.420	0.550
Door 2a - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.50, [Bldg. Use 1 - Multifamily] (b)	182	---	---	0.420	0.550
Door 3 - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.62, [Bldg. Use 1 - Multifamily] (b)	486	---	---	0.420	0.550
Door 3a - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.58, [Bldg. Use 1 - Multifamily] (b)	61	---	---	0.420	0.550
Door 3b - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.57, [Bldg. Use 1 - Multifamily] (b)	30	---	---	0.420	0.550
Exterior Wall - BRICK COMMERCIAL - NORTH: Steel-Framed, 16" o.c., [Bldg. Use 2 - commercial]	846	15.0	10.0	0.054	0.064
Exterior Wall - STONE - NORTH: Steel-Framed, 16" o.c., [Bldg. Use 1 - Multifamily]	527	15.0	10.0	0.054	0.064
Exterior Wall - METAL - NORTH: Steel-Framed, 16" o.c., [Bldg. Use 1 - Multifamily]	629	15.0	10.0	0.054	0.064
Cellar Wall North: Solid Concrete:12" Thickness, Normal Density, Furring: Metal, Wall Ht 10.0, Depth B.G. 10.0, [Bldg. Use 1 - Multifamily]	1051	0.0	0.0	0.410	0.579
EAST					
Exterior Wall - BRICK - EAST: Steel-Framed, 16" o.c., [Bldg. Use 1 - Multifamily]	41432	15.0	10.0	0.054	0.064
Window 1: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	7410	---	---	0.420	0.550
Window 2 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product	3006	---	---	0.420	0.550

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor[a]
ID NA, SHGC 0.55, PF 0.67, [Bldg. Use 1 - Multifamily] (b)					
Window 3 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.74, [Bldg. Use 1 - Multifamily] (b)	2343	---	---	0.420	0.550
Window 4 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.61, [Bldg. Use 1 - Multifamily] (b)	1677	---	---	0.420	0.550
Window 5 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.65, [Bldg. Use 1 - Multifamily] (b)	535	---	---	0.420	0.550
Window 6 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.59, [Bldg. Use 1 - Multifamily] (b)	590	---	---	0.420	0.550
Window 7 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.56, [Bldg. Use 1 - Multifamily] (b)	178	---	---	0.420	0.550
Window 8 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 5.00, [Bldg. Use 1 - Multifamily] (b)	45	---	---	0.420	0.550
Door 1: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	392	---	---	0.420	0.550
Door 2 - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.55, [Bldg. Use 1 - Multifamily] (b)	2187	---	---	0.420	0.550
Door 3 - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.50, [Bldg. Use 1 - Multifamily] (b)	395	---	---	0.420	0.550
Door 4 - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.62, [Bldg. Use 1 - Multifamily] (b)	1944	---	---	0.420	0.550
Door 5 - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.57, [Bldg. Use 1 - Multifamily] (b)	425	---	---	0.420	0.550
Door 6 - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 5.00, [Bldg. Use 1 - Multifamily] (b)	103	---	---	0.420	0.850
Door 26: Insulated Metal, Non-Swinging, [Bldg. Use 1 - Multifamily]	158	---	---	0.420	1.500
Cellar Wall East: Solid Concrete:12" Thickness, Normal Density, Furring: Metal, Wall Ht 10.0, Depth B.G. 10.0, [Bldg. Use 1 - Multifamily]	1055	0.0	0.0	0.410	0.579
SOUTH					
Exterior Wall - BRICK-SOUTH: Steel-Framed, 16" o.c., [Bldg. Use 1 - Multifamily]	31363	15.0	10.0	0.054	0.064
Window 1: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	6156	---	---	0.420	0.550
Window 2: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	51	---	---	0.420	0.550
Window 3: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	177	---	---	0.420	0.550
Window 4: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	1301	---	---	0.420	0.550
Window 5: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	64	---	---	0.420	0.550
Window 6: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	68	---	---	0.420	0.550
Window 7: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	89	---	---	0.420	0.550
Window 8: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	15	---	---	0.420	0.550
Window 9: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	167	---	---	0.420	0.550
Window 10 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.65, [Bldg. Use 1 - Multifamily] (b)	2257	---	---	0.420	0.550
Window 10a - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.58, [Bldg. Use 1 - Multifamily] (b)	460	---	---	0.420	0.550

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor[a]
Window 11 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.60, [Bldg. Use 1 - Multifamily] (b)	35	---	---	0.420	0.550
Window 11a - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.68, [Bldg. Use 1 - Multifamily] (b)	567	---	---	0.420	0.550
Window 11b - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.61, [Bldg. Use 1 - Multifamily] (b)	71	---	---	0.420	0.550
Window 12 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.53, [Bldg. Use 1 - Multifamily] (b)	15	---	---	0.420	0.550
Window 13 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.53, [Bldg. Use 1 - Multifamily] (b)	28	---	---	0.420	0.550
Window 14 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.65, [Bldg. Use 1 - Multifamily] (b)	85	---	---	0.420	0.550
Door 1: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	364	---	---	0.420	0.550
Door 2 - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.55, [Bldg. Use 1 - Multifamily] (b)	1701	---	---	0.420	0.550
Door 2a - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.50, [Bldg. Use 1 - Multifamily] (b)	304	---	---	0.420	0.550
Door 3: Uninsulated Single-Layer Metal, Non-Swinging, [Bldg. Use 1 - Multifamily]	48	---	---	0.420	1.500
Exterior Wall - METAL - SOUTH: Steel-Framed, 16" o.c., [Bldg. Use 1 - Multifamily]	673	15.0	10.0	0.054	0.064
Exterior Wall - STONE - SOUTH: Steel-Framed, 16" o.c., [Bldg. Use 1 - Multifamily]	220	15.0	10.0	0.054	0.064
Exterior Wall - BRICK COMMERCIAL- SOUTH: Steel-Framed, 16" o.c., [Bldg. Use 2 - commercial]	837	15.0	10.0	0.054	0.064
Window 15: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 2 - commercial] (b)	204	---	---	0.420	0.550
Cellar Wall South: Solid Concrete:12" Thickness, Normal Density, Furring: Metal, Wall Ht 10.0, Depth B.G. 10.0, [Bldg. Use 1 - Multifamily]	1051	0.0	0.0	0.410	0.579
WEST					
Exterior Wall - BRICK - WEST: Steel-Framed, 16" o.c., [Bldg. Use 1 - Multifamily]	32629	15.0	10.0	0.054	0.064
Window 1: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	11267	---	---	0.420	0.550
Window 2 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.62, [Bldg. Use 1 - Multifamily] (b)	211	---	---	0.420	0.550
Window 3 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.68, [Bldg. Use 1 - Multifamily] (b)	141	---	---	0.420	0.550
Window 4 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.44, [Bldg. Use 1 - Multifamily] (b)	141	---	---	0.420	0.550
Window 5 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.49, [Bldg. Use 1 - Multifamily] (b)	151	---	---	0.420	0.550
Window 6 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.86, [Bldg. Use 1 - Multifamily] (b)	75	---	---	0.420	0.550
Window 7 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.61, [Bldg. Use 1 - Multifamily] (b)	75	---	---	0.420	0.550
Window 8 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.74, [Bldg. Use 1 - Multifamily] (b)	2253	---	---	0.420	0.550
Window 9 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.70, [Bldg. Use 1 - Multifamily] (b)	157	---	---	0.420	0.550
Window 10 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.74, [Bldg. Use 1 - Multifamily] (b)	1126	---	---	0.420	0.550
Window 11 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.70, [Bldg. Use 1 - Multifamily] (b)	78	---	---	0.420	0.550
Window 12 - PF: Metal Frame with Thermal Break, Perf. Specs.:	73	---	---	0.420	0.550

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor[a]
Product ID NA, SHGC 0.55, PF 0.65, [Bldg. Use 1 - Multifamily] (b)					
Window 13 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.48, [Bldg. Use 1 - Multifamily] (b)	1170	---	---	0.420	0.550
Window 14 - PF: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.39, [Bldg. Use 1 - Multifamily] (b)	73	---	---	0.420	0.550
Door 1: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	243	---	---	0.420	0.550
Door 2 - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.57, [Bldg. Use 1 - Multifamily] (b)	184	---	---	0.420	0.550
Door 3 - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.88, [Bldg. Use 1 - Multifamily] (b)	182	---	---	0.420	0.550
Door 4 - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.62, [Bldg. Use 1 - Multifamily] (b)	3282	---	---	0.420	0.550
Door 5 - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.40, [Bldg. Use 1 - Multifamily] (b)	185	---	---	0.420	0.550
Door 6 - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.34, [Bldg. Use 1 - Multifamily] (b)	58	---	---	0.420	0.550
Door 7 - PF: Glass (> 50% glazing):Metal Frame, Non-Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.40, [Bldg. Use 1 - Multifamily] (b)	1040	---	---	0.420	0.550
Exterior Wall - METAL - WEST: Steel-Framed, 16" o.c., [Bldg. Use 1 - Multifamily]	3968	15.0	10.0	0.054	0.064
Exterior Wall - STONE - WEST: Steel-Framed, 16" o.c., [Bldg. Use 1 - Multifamily]	1506	15.0	10.0	0.054	0.064
Window 1 - Lobby: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 1 - Multifamily] (b)	623	---	---	0.420	0.550
Door 1 - Lobby: Glass (> 50% glazing):Metal Frame, Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.23, [Bldg. Use 1 - Multifamily] (b)	54	---	---	0.420	0.850
Exterior Wall - METAL COMMERCIAL - WEST: Steel-Framed, 16" o.c., [Bldg. Use 2 - commercial]	461	15.0	10.0	0.054	0.064
Exterior Wall - BRICK COMMERCIAL - WEST: Steel-Framed, 16" o.c., [Bldg. Use 2 - commercial]	2323	15.0	10.0	0.054	0.064
Window 1 - Commercial: Metal Frame with Thermal Break, Perf. Specs.: Product ID NA, SHGC 0.55, [Bldg. Use 2 - commercial] (b)	1014	---	---	0.420	0.550
Door 1 - Commercial: Glass (> 50% glazing):Metal Frame, Entrance Door, Perf. Specs.: Product ID NA, SHGC 0.55, PF 0.58, [Bldg. Use 2 - commercial] (b)	106	---	---	0.420	0.850
Cellar Wall West: Solid Concrete:12" Thickness, Normal Density, Furring: Metal, Wall Ht 10.0, Depth B.G. 10.0, [Bldg. Use 1 - Multifamily]	1055	0.0	0.0	0.410	0.579

(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.
(b) Fenestration product performance must be certified in accordance with NFRC and requires supporting documentation.

Envelope PASSES: Design 2% better than code

Envelope Compliance Statement

Compliance Statement: The proposed envelope design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed envelope systems have been designed to meet the 90.1 (2007) Standard requirements in COM*check* Version 4.0.0 and to comply with the mandatory requirements listed in the Inspection Checklist.

Name - Title Signature Date

COMcheck Software Version 4.0.0

Inspection Checklist

Energy Code: 90.1 (2007) Standard

Requirements: 0.0% were addressed directly in the COM*check* software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

90.1 (2007) Standard	Plan Review	Complies?	Comments/Assumptions
4.2.2 [PR1][1]	Plans and/or specifications provide all information with which compliance can be determined for the building envelope and document where exceptions to the standard are claimed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

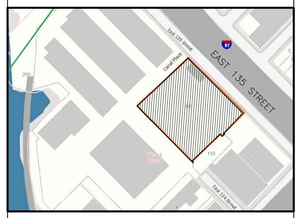
1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Footing / Foundation Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
5.5.3.3 [FO1][1]	Below-grade wall insulation R-value.	R-____	R-____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
5.8.1.2 [FO2][1]	Below-grade wall insulation installed per manufacturer's instructions.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
5.5.3.5 [FO3][1]	Slab edge insulation R-value.	R-____ ☐ Unheated ☐ Heated	R-____ ☐ Unheated ☐ Heated	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
5.5.3.5 [FO5][1]	Slab edge insulation depth/length.	____ ft	____ ft	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
5.8.1.7.3 [FO7][1]	Insulation in contact with the ground has <=0.3% water absorption rate per ASTM C272.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

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SEAL

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ENERGY COMPLIANCE

dob no

scale: NTS	project no.: 15-23
date:	sheet no.: 27 OF
drawn:	drawing no.: EN-001.00
checked: KF	

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Section # & Req.ID	Framing / Rough-In Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
5.4.3.2 [FR1][1]	Factory-built fenestration and doors are labeled as meeting air leakage requirements.	Fenestration___ _ cfm/ft² Doors ____ cfm/ft²	Fenestration___ _ cfm/ft² Doors ____ cfm/ft²	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
5.4.3.4 [FR4][1]	Vestibules are installed where building entrances separate conditioned space from the exterior, and meet exterior envelope requirements. Doors have self-closing devices, and are >=7 ft apart.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
5.5.4.3a [FR8][1]	Vertical fenestration U-Factor.	U-____	U-____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
5.5.4.3b [FR9][1]	Skylight fenestration U-Factor.	U-____	U-____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
5.5.4.4.1 [FR10][1]	Vertical fenestration SHGC value.	SHGC:____	SHGC:____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
5.5.4.4.2 [FR11][1]	Skylight SHGC value.	SHGC:____	SHGC:____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
5.8.2.1, 5.8.2.4 [FR12][2]	Fenestration products rated in accordance with NFRC.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
5.8.2.2 [FR13][1]	Fenestration products are certified as to performance labels or certificates provided.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
5.8.2.3, 5.5.3.6 [FR14][2]	U-factor of opaque doors associated with the building thermal envelope meets requirements.	U-____ ☐ Swinging ☐ Nonswinging	U-____ ☐ Swinging ☐ Nonswinging	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*

Additional Comments/Assumptions:

1 High Impact (Tier 1) | 2 Medium Impact (Tier 2) | 3 Low Impact (Tier 3)

Section # & Req.ID	Insulation Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
5.4.3.1 [IN1][1]	All sources of air leakage in the building thermal envelope are sealed, caulked, gasketed, weather stripped or wrapped with moisture vapor-permeable wrapping material to minimize air leakage.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
5.5.3.1 [IN2][1]	Roof R-value. For some ceiling systems, verification may need to occur during Framing Inspection.	R-____ ☐ Above deck ☐ Metal ☐ Attic	R-____ ☐ Above deck ☐ Metal ☐ Attic	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
5.8.1.2, 5.8.1.3 [IN3][1]	Roof insulation installed per manufacturer's instructions. Blown or poured loose-fill insulation is installed only where the roof slope is <=3 in 12.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
5.5.3.1.1 [IN5][3]	High-albedo roofs meet solar reflectance of 0.70 and thermal emittance of 0.75 or SRI of 82.	SR:____ SRI:____	SR:____ SRI:____	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
5.5.3.2 [IN6][1]	Above-grade wall insulation R-value.	R-____ ☐ Mass ☐ Metal ☐ Steel ☐ Wood	R-____ ☐ Mass ☐ Metal ☐ Steel ☐ Wood	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
5.8.1.2 [IN7][1]	Above-grade wall insulation installed per manufacturer's instructions.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
5.5.3.4 [IN8][1]	Floor insulation R-value.	R-____ ☐ Mass ☐ Steel ☐ Wood	R-____ ☐ Mass ☐ Steel ☐ Wood	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Envelope Assemblies table for values.*
5.8.1.1 [IN10][2]	Building envelope insulation is labeled with R-value or insulation certificate providing R-value and other relevant data.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
5.8.1.4 [IN11][2]	Eaves are baffled to deflect air to above the insulation.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
5.8.1.5 [IN12][2]	Insulation is installed in substantial contact with the inside surface separating conditioned space from unconditional space.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
5.8.1.6 [IN13][2]	Recessed equipment installed in building envelope assemblies does not compress the adjacent insulation.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

1 High Impact (Tier 1) | 2 Medium Impact (Tier 2) | 3 Low Impact (Tier 3)

Section # & Req.ID	Insulation Inspection	Plans Verified Value	Field Verified Value	Complies?	Comments/Assumptions
5.8.1.7 [IN14][2]	Exterior insulation is protected from damage with a protective material. Verification for exposed foundation insulation may need to occur during Foundation Inspection.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
5.8.1.7.1 [IN15][2]	Attics and mechanical rooms have insulation protected where adjacent to attic or equipment access.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
5.8.1.7.2 [IN16][2]	Foundation vents do not interfere with insulation.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
5.8.1.8 [IN17][3]	Insulation intended to meet the roof insulation requirements cannot be installed on top of a suspended ceiling. Mark this requirement compliant if insulation is installed accordingly.			☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

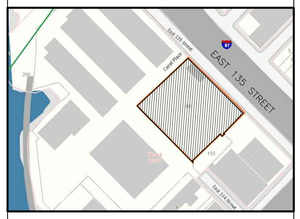
1 High Impact (Tier 1) | 2 Medium Impact (Tier 2) | 3 Low Impact (Tier 3)

90.1 (2007) Standard	Final Inspection	Complies?	Comments/Assumptions
5.4.3.3 [F1][1]	Weatherseals installed on all loading dock cargo doors in Climate Zones 4-8.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) | 2 Medium Impact (Tier 2) | 3 Low Impact (Tier 3)

KEY PLAN



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drawing title
ENERGY COMPLIANCE

dob no

scale: NTS	project no.: 15-23
date:	sheet no.: 28 OF
drawn:	drawing no.: EN-002.00
checked: KF	

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TABULAR ENERGY ANALYSIS (1RCNY §5000-01)
MIX USE
NEW BUILDING
CLIMATE ZONE 4a
ASHRAE 90.1-2007

ITEM	INSPECTION / TEST	FREQUESNCY (MIN)	REFERENCE STANDARD (SEE ECC CHAPTER 6) OR OTHER CRITERIA	ECC OR OTHER CITATION
IIA	ENVELOPE INSPECTIONS			
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 LABELED, 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
IIA7	PROJECTION FACTORS: WHERE THE ENERGY ANALYSIS UTILIZED A PROJECTION FACTOR > 0, THE PROJECTION DIMENSIONS OF OVERHANGS, EAVES OR PERMANENTLY ATTACHED SHADING DEVICES SHALL BE VERIFIED FOR CONFORMANCE WITH APPROVED PLANS BY VISUAL INSPECTION. A	PRIOR TO FINAL CONSTRUCTION INSPECTION	APPROVED CONSTRUCTION DOCUMENTS, INCLUDING ENERGY ANALYSIS	502.3; ASHRAE 90.1 - 5.5.4, 5.6 OR 11
IIA9	BUILDING ENTRANCE VESTIBULES: REQUIRED ENTRANCE VESTIBULES SHALL BE VISUALLY INSPECTED FOR PROPER OPERATION.	PRIOR TO FINAL CONSTRUCTION INSPECTION	APPROVED CONSTRUCTION DOCUMENTS	502.4.6; ASHRAE 90.1 - 5.4.3.4

TABULAR ENERGY ANALYSIS (1RCNY §5000-01)
MIX USE
NEW BUILDING
CLIMATE ZONE 4a
ASHRAE 90.1-2007

ITEM	INSPECTION / TEST	FREQUESNCY (MIN)	REFERENCE STANDARD (SEE ECC CHAPTER 6) OR OTHER CRITERIA	ECC OR OTHER CITATION
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. POOL HEATERS AND COVERS SHALL BE VERIFIED BY VISUAL INSPECTION.	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 INSPECTOR'S REQUEST FOR SUCH ACCESS TO PERFORM THE PROGRESS 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

TABULAR ENERGY ANALYSIS (1RCNY §5000-01)
MIX USE
NEW BUILDING
CLIMATE ZONE 4a
ASHRAE 90.1-2007

ITEM	INSPECTION / TEST	FREQUESNCY (MIN)	REFERENCE STANDARD (SEE ECC CHAPTER 6) OR OTHER CRITERIA	ECC OR OTHER CITATION
IIC	ELECTRICAL POWER AND LIGHTING SYSTEMS			
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; 1RCNY §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; 1RCNY §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
IIC8	ELECTRIC MOTORS (INCLUDING BUT NOT LIMITED TO FAN MOTORS): WHERE REQUIRED BY THE CONSTRUCTION DOCUMENTS FOR ENERGY CODE COMPLIANCE, MOTOR LISTING OR LABELS SHALL BE VISUALLY INSPECTED TO VERIFY THAT THEY COMPLY WITH THE RESPECTIVE ENERGY REQUIREMENTS IN THE CONSTRUCTION DOCUMENTS.	PRIOR TO FINAL ELECTRICAL AND CONSTRUCTION INSPECTION	APPROVED CONSTRUCTION DOCUMENTS	503.2.10; ASHRAE 90.1 - 10.4

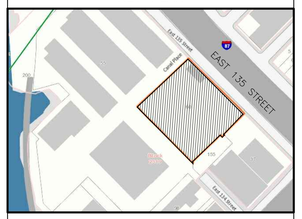
TABULAR ENERGY ANALYSIS (1RCNY §5000-01)
MIX USE
NEW BUILDING
CLIMATE ZONE 4a
ASHRAE 90.1-2007

ITEM	INSPECTION / TEST	FREQUESNCY (MIN)	REFERENCE STANDARD (SEE ECC CHAPTER 6) OR OTHER CRITERIA	ECC OR OTHER CITATION
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	303.3, 503.2.9.3; ASHRAE 90.1 - 4.2.2.3, 6.7.2.2, 8.7.2

NYCECC 2011 COMPLIANCE NOTE

1. " TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGMENT, THIS APPLICATION IS IN COMPLIANCE WITH THE NYCECC 2011

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

ISSUES/REVISIONS

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SEAL

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project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ENERGY COMPLIANCE

dob no

scale: NTS	project no.: 15-23
date:	sheet no.: 29 OF
drawn:	drawing no.: EN-003.00
checked: KF	

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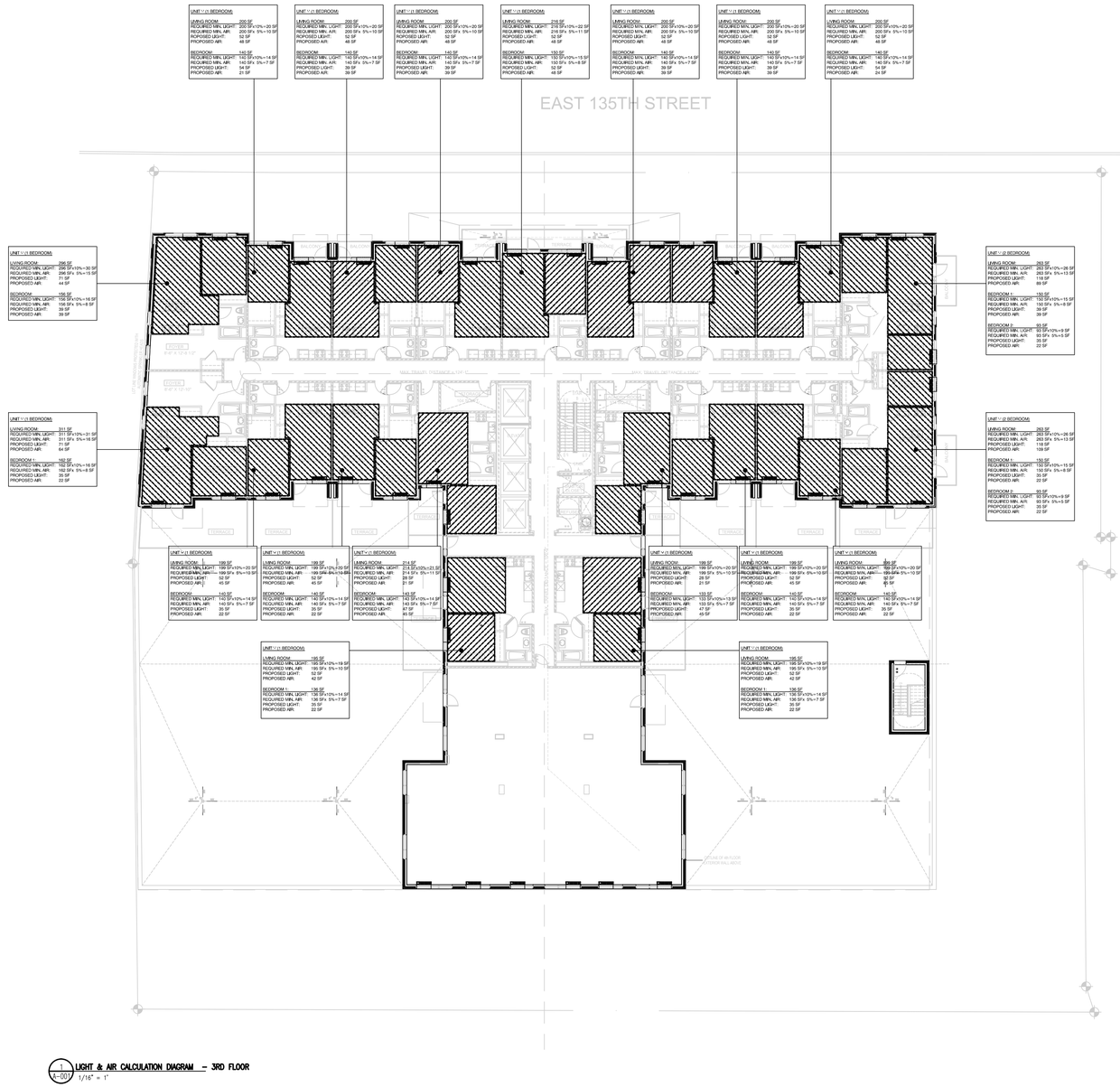
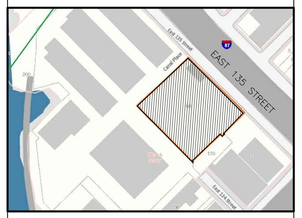


1 A-001 LIGHT & AIR CALCULATION DIAGRAM – 3RD FLOOR
1/16" = 1'

KEY PLAN



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SEAL
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project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
LIGHT & AIR CALCULATION DIAGRAM

dob no

scale: AS INDICATED	project no.: 15-23
date: 2015-07-09	sheet no.: 10OF
drawn: VV	drawing no.: A-001.00
checked: KF	

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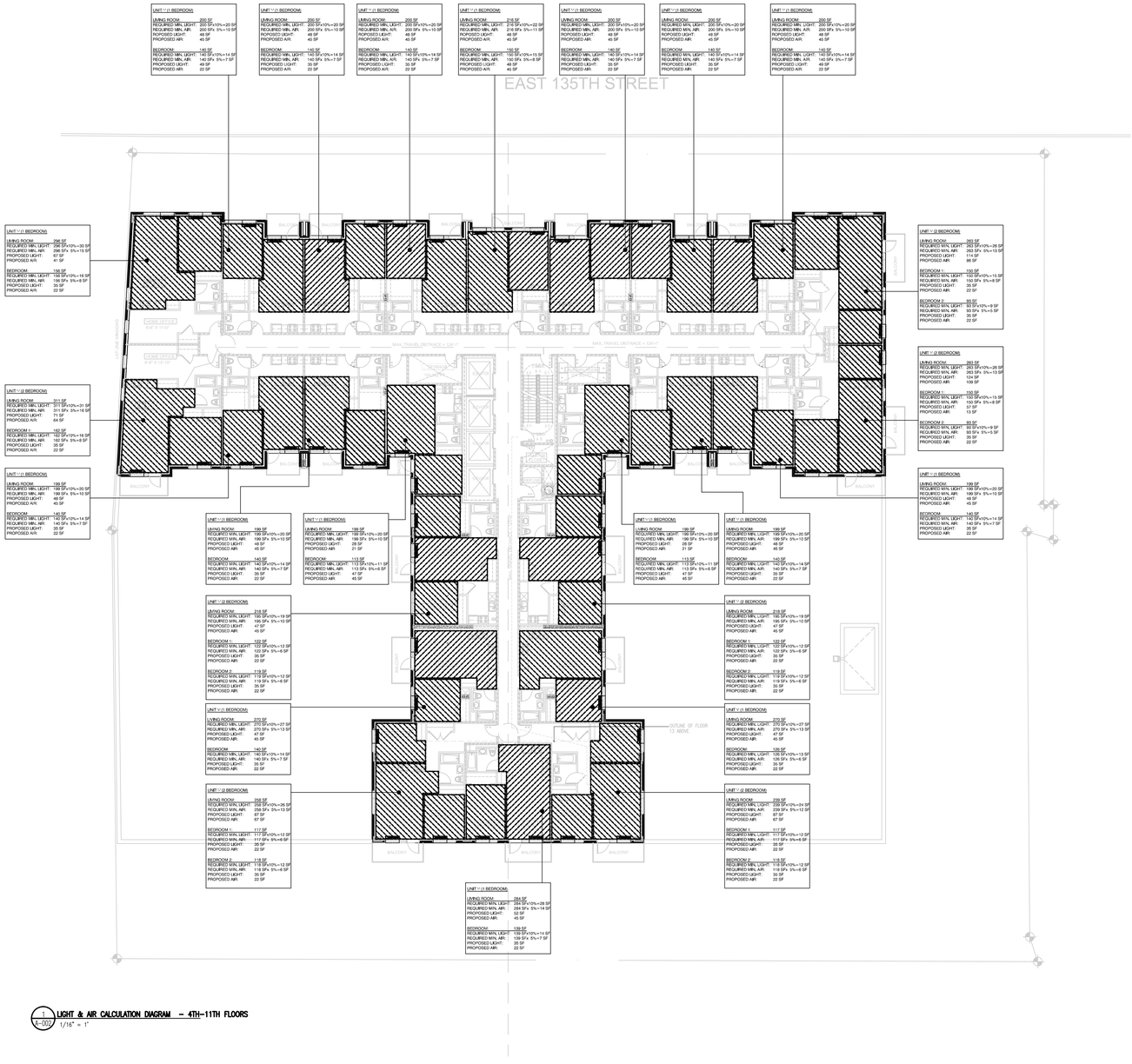
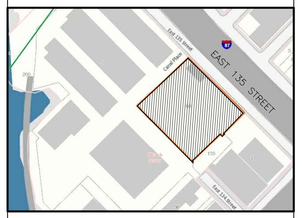


1 A-002 **LIGHT & AIR CALCULATION DIAGRAM - 4TH-11TH FLOORS**
1/16" = 1'

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
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RESIDENTIAL DEVELOPMENT
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LIGHT & AIR CALCULATION DIAGRAM

dob no

scale: AS INDICATED	project no.: 15-23
date: 2015-07-09	sheet no.: 10OF
drawn: VV	drawing no.: A-002.00
checked: KF	

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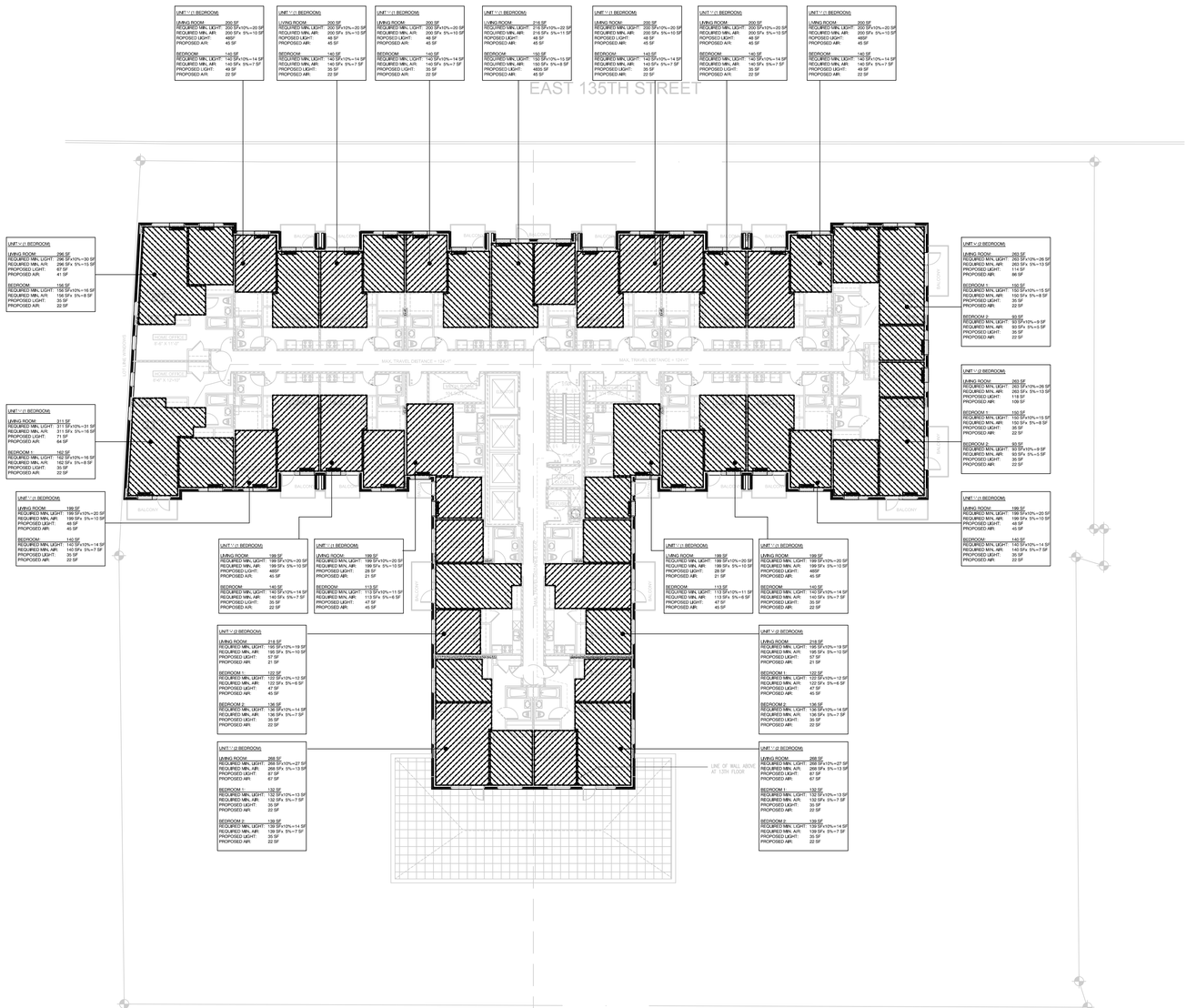
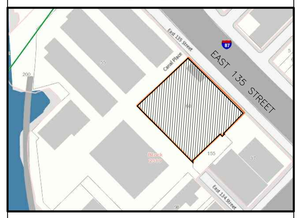


1/A-003 LIGHT & AIR CALCULATION DIAGRAM – 12TH FLOOR
1/16" = 1'

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

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SEAL
REGISTERED ARCHITECT KARL FISCHER 001282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
LIGHT & AIR CALCULATION DIAGRAM

dob no

scale: AS INDICATED	project no.: 15-23
date: 2015-07-09	sheet no.: 10 OF
drawn: VV	drawing no.: A-003.00
checked: KF	

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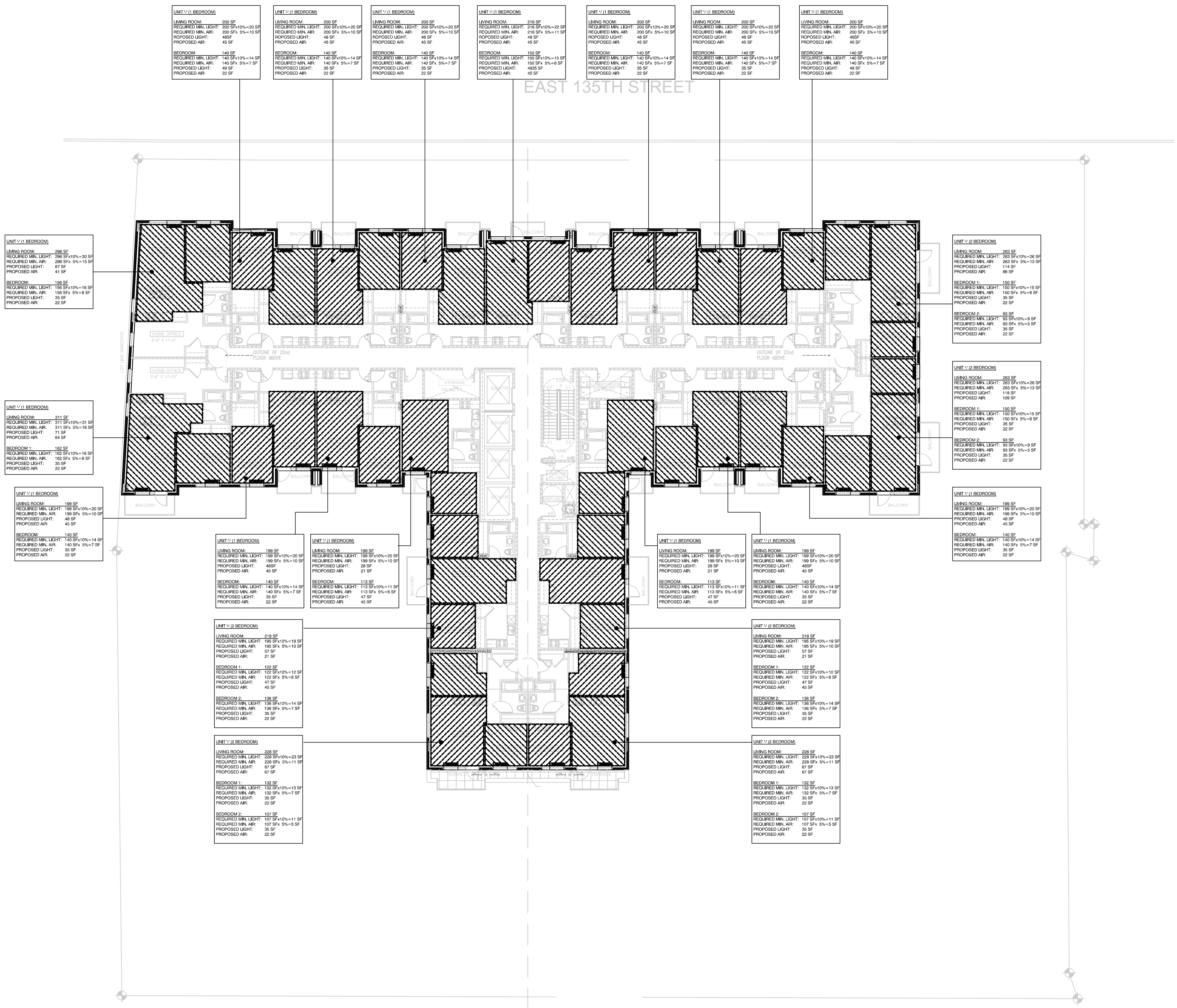


UNIT '-' (1 BEDROOM)

LIVING ROOM: 200 SF
REQUIRED MIN. LIGHT: 200 SFx10%=20 SF
REQUIRED MIN. AIR: 200 SFx 5%=10 SF
ROPOSED LIGHT: 48SF
PROPOSED AIR: 45 SF

BEDROOM: 140 SF
REQUIRED MIN. LIGHT: 140 SFx10%=14 SF
REQUIRED MIN. AIR: 140 SFx 5%=7 SF
PROPOSED LIGHT: 49 SF
PROPOSED AIR: 22 SF

UNIT '-' (1 BEDROOM)

LIVING ROOM: 200 SF
REQUIRED MIN. LIGHT: 200 SFx10%=20 SF
REQUIRED MIN. AIR: 200 SFx 5%=10 SF
ROPOSED LIGHT: 48 SF
PROPOSED AIR: 45 SF

BEDROOM: 140 SF
REQUIRED MIN. LIGHT: 140 SFx10%=14 SF
REQUIRED MIN. AIR: 140 SFx 5%=7 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

UNIT '-' (1 BEDROOM)

LIVING ROOM: 200 SF
REQUIRED MIN. LIGHT: 200 SFx10%=20 SF
REQUIRED MIN. AIR: 200 SFx 5%=10 SF
ROPOSED LIGHT: 48 SF
PROPOSED AIR: 45 SF

BEDROOM: 140 SF
REQUIRED MIN. LIGHT: 140 SFx10%=14 SF
REQUIRED MIN. AIR: 140 SFx 5%=7 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

UNIT '-' (1 BEDROOM)

LIVING ROOM: 216 SF
REQUIRED MIN. LIGHT: 216 SFx10%=22 SF
REQUIRED MIN. AIR: 216 SFx 5%=11 SF
ROPOSED LIGHT: 48 SF
PROPOSED AIR: 45 SF

BEDROOM: 150 SF
REQUIRED MIN. LIGHT: 150 SFx10%=15 SF
REQUIRED MIN. AIR: 150 SFx 5%=8 SF
PROPOSED LIGHT: 4835 SF
PROPOSED AIR: 45 SF

UNIT '-' (1 BEDROOM)

LIVING ROOM: 200 SF
REQUIRED MIN. LIGHT: 200 SFx10%=20 SF
REQUIRED MIN. AIR: 200 SFx 5%=10 SF
ROPOSED LIGHT: 48 SF
PROPOSED AIR: 45 SF

BEDROOM: 140 SF
REQUIRED MIN. LIGHT: 140 SFx10%=14 SF
REQUIRED MIN. AIR: 140 SFx 5%=7 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

UNIT '-' (1 BEDROOM)

LIVING ROOM: 200 SF
REQUIRED MIN. LIGHT: 200 SFx10%=20 SF
REQUIRED MIN. AIR: 200 SFx 5%=10 SF
ROPOSED LIGHT: 48 SF
PROPOSED AIR: 45 SF

BEDROOM: 140 SF
REQUIRED MIN. LIGHT: 140 SFx10%=14 SF
REQUIRED MIN. AIR: 140 SFx 5%=7 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

UNIT '-' (1 BEDROOM)

LIVING ROOM: 200 SF
REQUIRED MIN. LIGHT: 200 SFx10%=20 SF
REQUIRED MIN. AIR: 200 SFx 5%=10 SF
ROPOSED LIGHT: 48SF
PROPOSED AIR: 45 SF

BEDROOM: 140 SF
REQUIRED MIN. LIGHT: 140 SFx10%=14 SF
REQUIRED MIN. AIR: 140 SFx 5%=7 SF
PROPOSED LIGHT: 49 SF
PROPOSED AIR: 22 SF

UNIT '-' (1 BEDROOM)

LIVING ROOM: 296 SF
REQUIRED MIN. LIGHT: 296 SFx10%=30 SF
REQUIRED MIN. AIR: 296 SFx 5%=15 SF
PROPOSED LIGHT: 67 SF
PROPOSED AIR: 41 SF

BEDROOM: 156 SF
REQUIRED MIN. LIGHT: 156 SFx10%=16 SF
REQUIRED MIN. AIR: 156 SFx 5%=8 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

UNIT '-' (1 BEDROOM)

LIVING ROOM: 311 SF
REQUIRED MIN. LIGHT: 311 SFx10%=31 SF
REQUIRED MIN. AIR: 311 SFx 5%=16 SF
PROPOSED LIGHT: 71 SF
PROPOSED AIR: 64 SF

BEDROOM 1: 162 SF
REQUIRED MIN. LIGHT: 162 SFx10%=16 SF
REQUIRED MIN. AIR: 162 SFx 5%=8 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

UNIT '-' (1 BEDROOM)

LIVING ROOM: 199 SF
REQUIRED MIN. LIGHT: 199 SFx10%=20 SF
REQUIRED MIN. AIR: 199 SFx 5%=10 SF
PROPOSED LIGHT: 48 SF
PROPOSED AIR: 45 SF

BEDROOM: 140 SF
REQUIRED MIN. LIGHT: 140 SFx10%=14 SF
REQUIRED MIN. AIR: 140 SFx 5%=7 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

UNIT '-' (2 BEDROOM)

LIVING ROOM: 263 SF
REQUIRED MIN. LIGHT: 263 SFx10%=26 SF
REQUIRED MIN. AIR: 263 SFx 5%=13 SF
PROPOSED LIGHT: 114 SF
PROPOSED AIR: 86 SF

BEDROOM 1: 150 SF
REQUIRED MIN. LIGHT: 150 SFx10%=15 SF
REQUIRED MIN. AIR: 150 SFx 5%=8 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

BEDROOM 2: 93 SF
REQUIRED MIN. LIGHT: 93 SFx10%=9 SF
REQUIRED MIN. AIR: 93 SFx 5%=5 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

UNIT '-' (2 BEDROOM)

LIVING ROOM: 263 SF
REQUIRED MIN. LIGHT: 263 SFx10%=26 SF
REQUIRED MIN. AIR: 263 SFx 5%=13 SF
PROPOSED LIGHT: 118 SF
PROPOSED AIR: 109 SF

BEDROOM 1: 150 SF
REQUIRED MIN. LIGHT: 150 SFx10%=15 SF
REQUIRED MIN. AIR: 150 SFx 5%=8 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

BEDROOM 2: 93 SF
REQUIRED MIN. LIGHT: 93 SFx10%=9 SF
REQUIRED MIN. AIR: 93 SFx 5%=5 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

UNIT '-' (1 BEDROOM)

LIVING ROOM: 199 SF
REQUIRED MIN. LIGHT: 199 SFx10%=20 SF
REQUIRED MIN. AIR: 199 SFx 5%=10 SF
PROPOSED LIGHT: 48 SF
PROPOSED AIR: 45 SF

BEDROOM: 140 SF
REQUIRED MIN. LIGHT: 140 SFx10%=14 SF
REQUIRED MIN. AIR: 140 SFx 5%=7 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

UNIT '-' (1 BEDROOM)

LIVING ROOM: 199 SF
REQUIRED MIN. LIGHT: 199 SFx10%=20 SF
REQUIRED MIN. AIR: 199 SFx 5%=10 SF
PROPOSED LIGHT: 48SF
PROPOSED AIR: 45 SF

BEDROOM: 140 SF
REQUIRED MIN. LIGHT: 140 SFx10%=14 SF
REQUIRED MIN. AIR: 140 SFx 5%=7 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

UNIT '-' (1 BEDROOM)

LIVING ROOM: 199 SF
REQUIRED MIN. LIGHT: 199 SFx10%=20 SF
REQUIRED MIN. AIR: 199 SFx 5%=10 SF
PROPOSED LIGHT: 28 SF
PROPOSED AIR: 21 SF

BEDROOM: 113 SF
REQUIRED MIN. LIGHT: 113 SFx10%=11 SF
REQUIRED MIN. AIR: 113 SFx 5%=6 SF
PROPOSED LIGHT: 47 SF
PROPOSED AIR: 45 SF

UNIT '-' (2 BEDROOM)

LIVING ROOM: 218 SF
REQUIRED MIN. LIGHT: 195 SFx10%=19 SF
REQUIRED MIN. AIR: 195 SFx 5%=10 SF
PROPOSED LIGHT: 57 SF
PROPOSED AIR: 21 SF

BEDROOM 1: 122 SF
REQUIRED MIN. LIGHT: 122 SFx10%=12 SF
REQUIRED MIN. AIR: 122 SFx 5%=6 SF
PROPOSED LIGHT: 47 SF
PROPOSED AIR: 45 SF

BEDROOM 2: 136 SF
REQUIRED MIN. LIGHT: 136 SFx10%=14 SF
REQUIRED MIN. AIR: 136 SFx 5%=7 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

UNIT '-' (2 BEDROOM)

LIVING ROOM: 228 SF
REQUIRED MIN. LIGHT: 228 SFx10%=23 SF
REQUIRED MIN. AIR: 228 SFx 5%=11 SF
PROPOSED LIGHT: 87 SF
PROPOSED AIR: 67 SF

BEDROOM 1: 132 SF
REQUIRED MIN. LIGHT: 132 SFx10%=13 SF
REQUIRED MIN. AIR: 132 SFx 5%=7 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

BEDROOM 2: 107 SF
REQUIRED MIN. LIGHT: 107 SFx10%=11 SF
REQUIRED MIN. AIR: 107 SFx 5%=5 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

UNIT '-' (1 BEDROOM)

LIVING ROOM: 199 SF
REQUIRED MIN. LIGHT: 199 SFx10%=20 SF
REQUIRED MIN. AIR: 199 SFx 5%=10 SF
PROPOSED LIGHT: 28 SF
PROPOSED AIR: 21 SF

BEDROOM: 113 SF
REQUIRED MIN. LIGHT: 113 SFx10%=11 SF
REQUIRED MIN. AIR: 113 SFx 5%=6 SF
PROPOSED LIGHT: 47 SF
PROPOSED AIR: 45 SF

UNIT '-' (1 BEDROOM)

LIVING ROOM: 199 SF
REQUIRED MIN. LIGHT: 199 SFx10%=20 SF
REQUIRED MIN. AIR: 199 SFx 5%=10 SF
PROPOSED LIGHT: 48SF
PROPOSED AIR: 45 SF

BEDROOM: 140 SF
REQUIRED MIN. LIGHT: 140 SFx10%=14 SF
REQUIRED MIN. AIR: 140 SFx 5%=7 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

UNIT '-' (2 BEDROOM)

LIVING ROOM: 218 SF
REQUIRED MIN. LIGHT: 195 SFx10%=19 SF
REQUIRED MIN. AIR: 195 SFx 5%=10 SF
PROPOSED LIGHT: 57 SF
PROPOSED AIR: 21 SF

BEDROOM 1: 122 SF
REQUIRED MIN. LIGHT: 122 SFx10%=12 SF
REQUIRED MIN. AIR: 122 SFx 5%=6 SF
PROPOSED LIGHT: 47 SF
PROPOSED AIR: 45 SF

BEDROOM 2: 136 SF
REQUIRED MIN. LIGHT: 136 SFx10%=14 SF
REQUIRED MIN. AIR: 136 SFx 5%=7 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

UNIT '-' (2 BEDROOM)

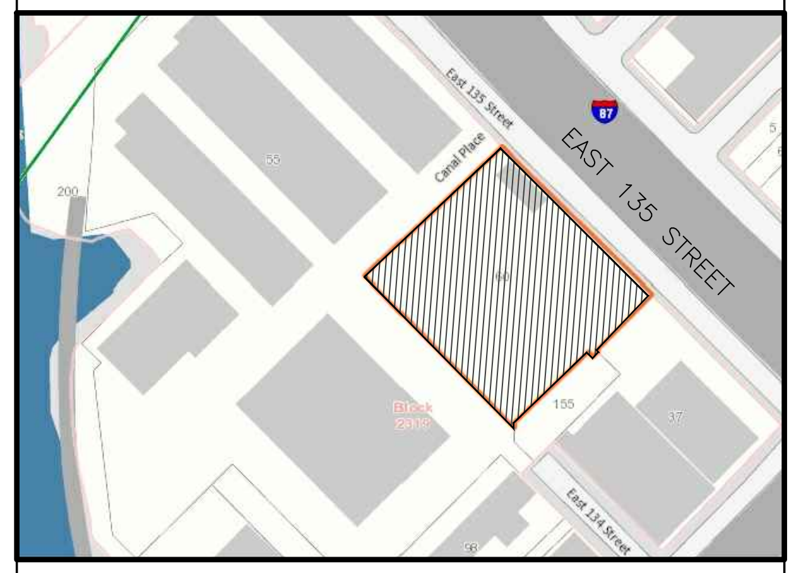
LIVING ROOM: 228 SF
REQUIRED MIN. LIGHT: 228 SFx10%=23 SF
REQUIRED MIN. AIR: 228 SFx 5%=11 SF
PROPOSED LIGHT: 87 SF
PROPOSED AIR: 67 SF

BEDROOM 1: 132 SF
REQUIRED MIN. LIGHT: 132 SFx10%=13 SF
REQUIRED MIN. AIR: 132 SFx 5%=7 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

BEDROOM 2: 107 SF
REQUIRED MIN. LIGHT: 107 SFx10%=11 SF
REQUIRED MIN. AIR: 107 SFx 5%=5 SF
PROPOSED LIGHT: 35 SF
PROPOSED AIR: 22 SF

1
A-004
LIGHT & AIR CALCULATION DIAGRAM - 13TH FLOOR
1/16" = 1'

KEY PLAN



BLOCK: 2319 LOT: 60

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SEAL
KARL FISCHER
021282

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
LIGHT & AIR CALCULATION DIAGRAM

dob no

scale	project no.
AS INDICATED	15-23
date	sheet no.
2015-07-09	10 OF
drawn	drawing no.
VV	A-004.00
checked	
KF	

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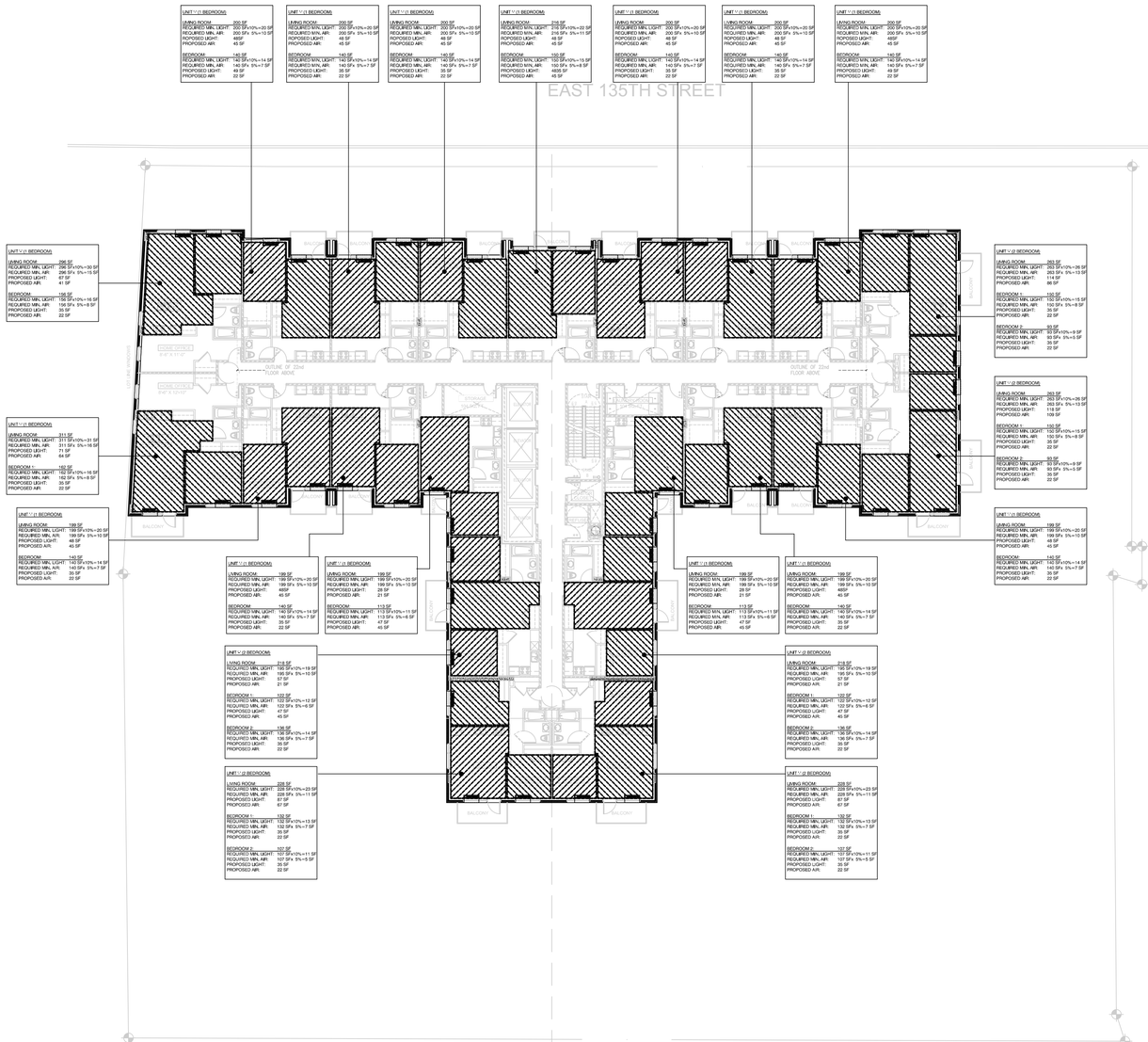

1 A-005 LIGHT & AIR CALCULATION DIAGRAM – 14TH – 20TH FLOOR
1/16" = 1'

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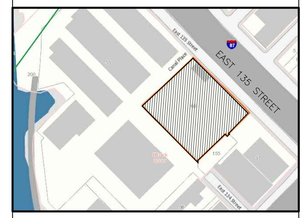
KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

ISSUES/REVISIONS

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project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
LIGHT & AIR CALCULATION DIAGRAM

dob no

scale: AS INDICATED	project no.: 15-23
date: 2015-07-09	sheet no.: 10 OF
drawn: VV	drawing no.: A-005.00
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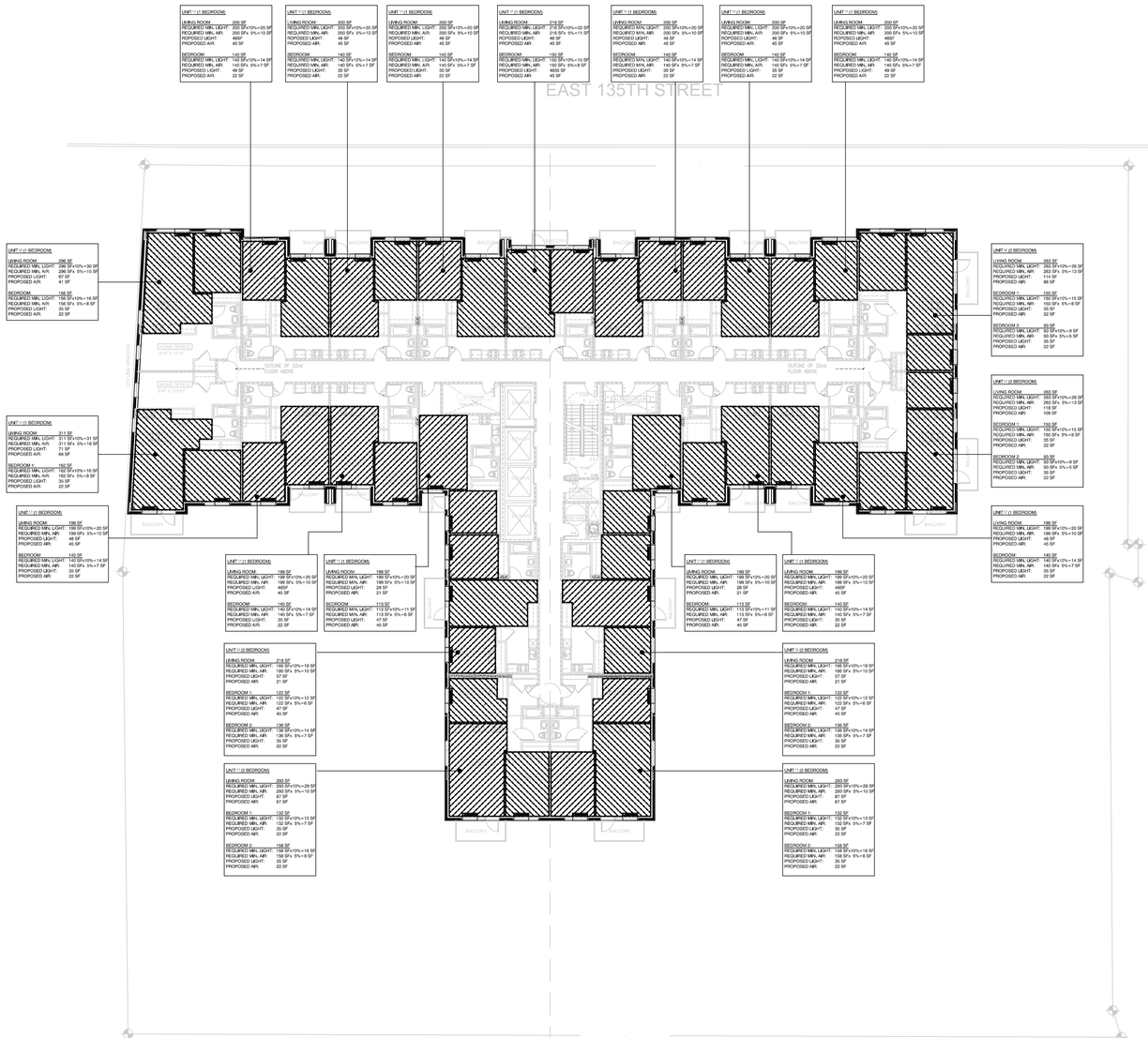
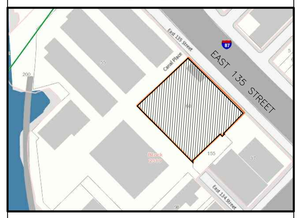


1 A-006 LIGHT & AIR CALCULATION DIAGRAM – 21TH FLOOR
1/16" = 1'

KEY PLAN



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REGISTERED ARCHITECT KARL FISCHER 087282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
LIGHT & AIR CALCULATION DIAGRAM

dob no

scale: AS INDICATED	project no.: 15-23
date: 2015-07-09	sheet no.: 10 OF
drawn: VV	drawing no.: A-006.00
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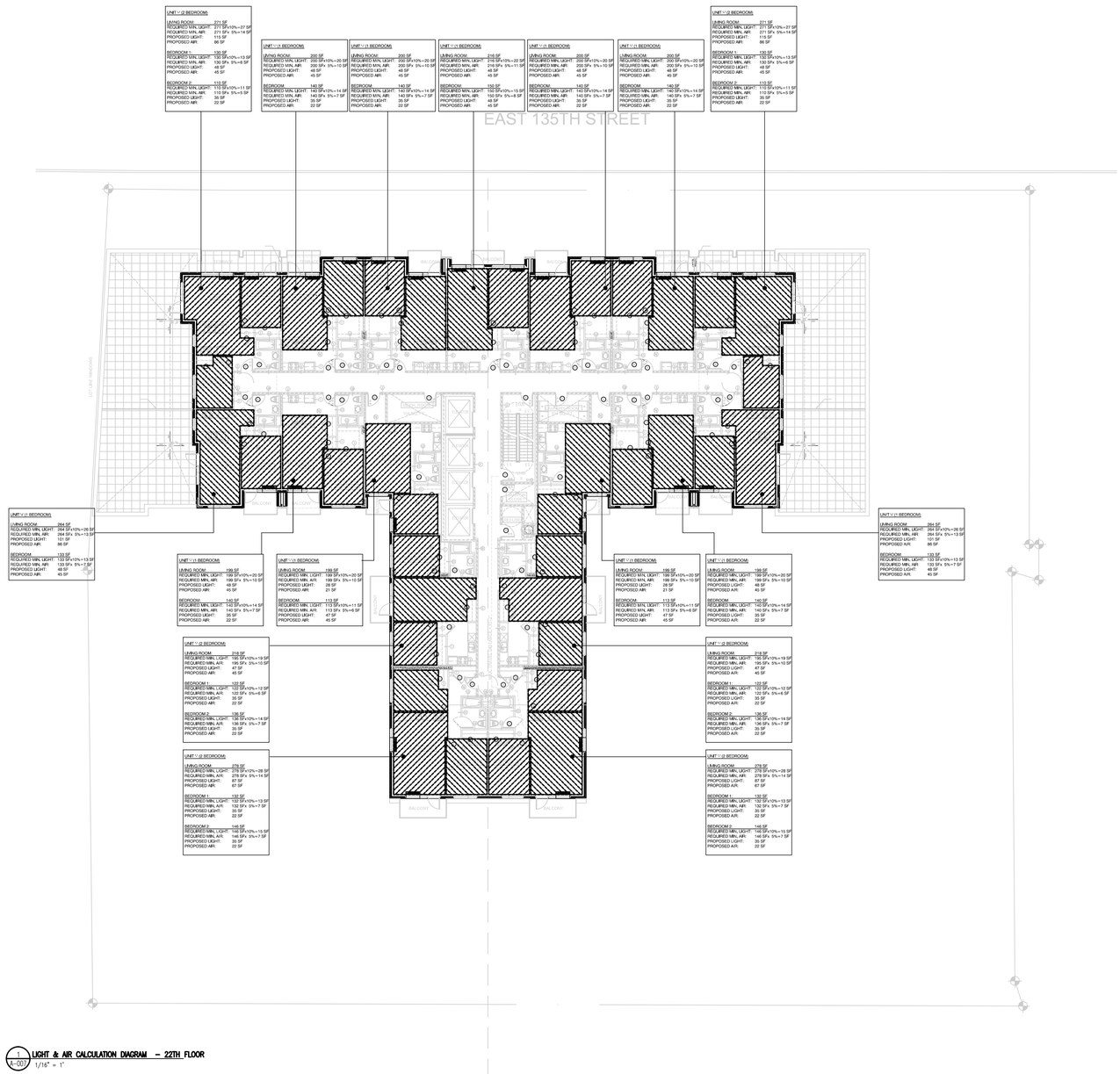
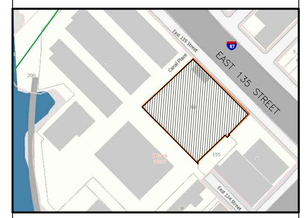


1/A-007 LIGHT & AIR CALCULATION DIAGRAM – 22TH FLOOR
1/16" = 1'

KEY PLAN



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SEAL

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
LIGHT & AIR CALCULATION DIAGRAM

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date 2015-07-09	sheet no. 10 OF
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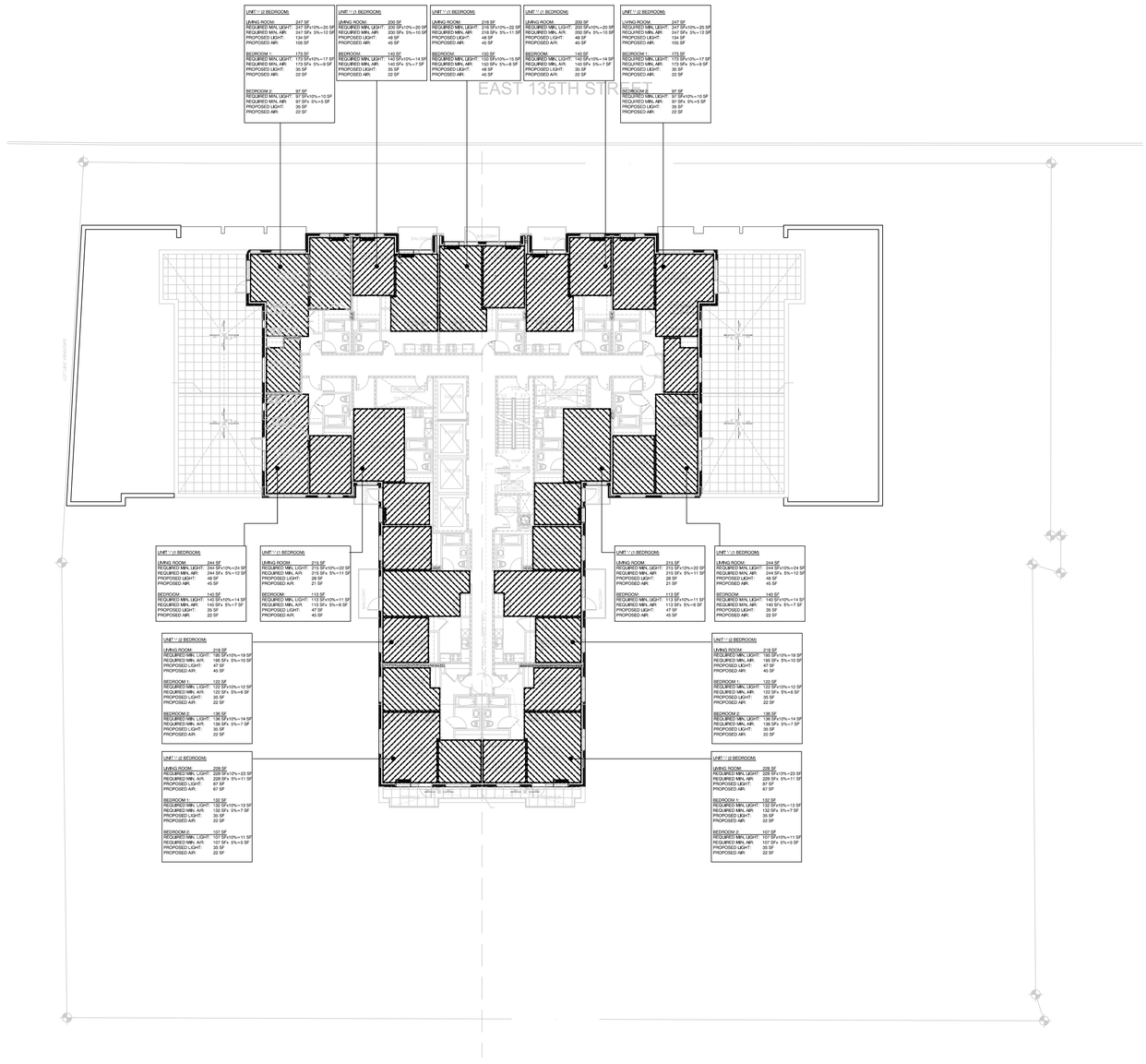
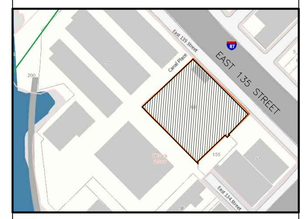


A-008 LIGHT & AIR CALCULATION DIAGRAM – 23RD FLOOR
1/16" = 1'

KEY PLAN



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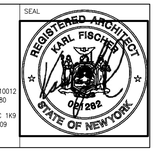

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
LIGHT & AIR CALCULATION DIAGRAM

dob no

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date: 2015–07–09	sheet no.: 10 OF
drawn: VV	drawing no.: A-008.00
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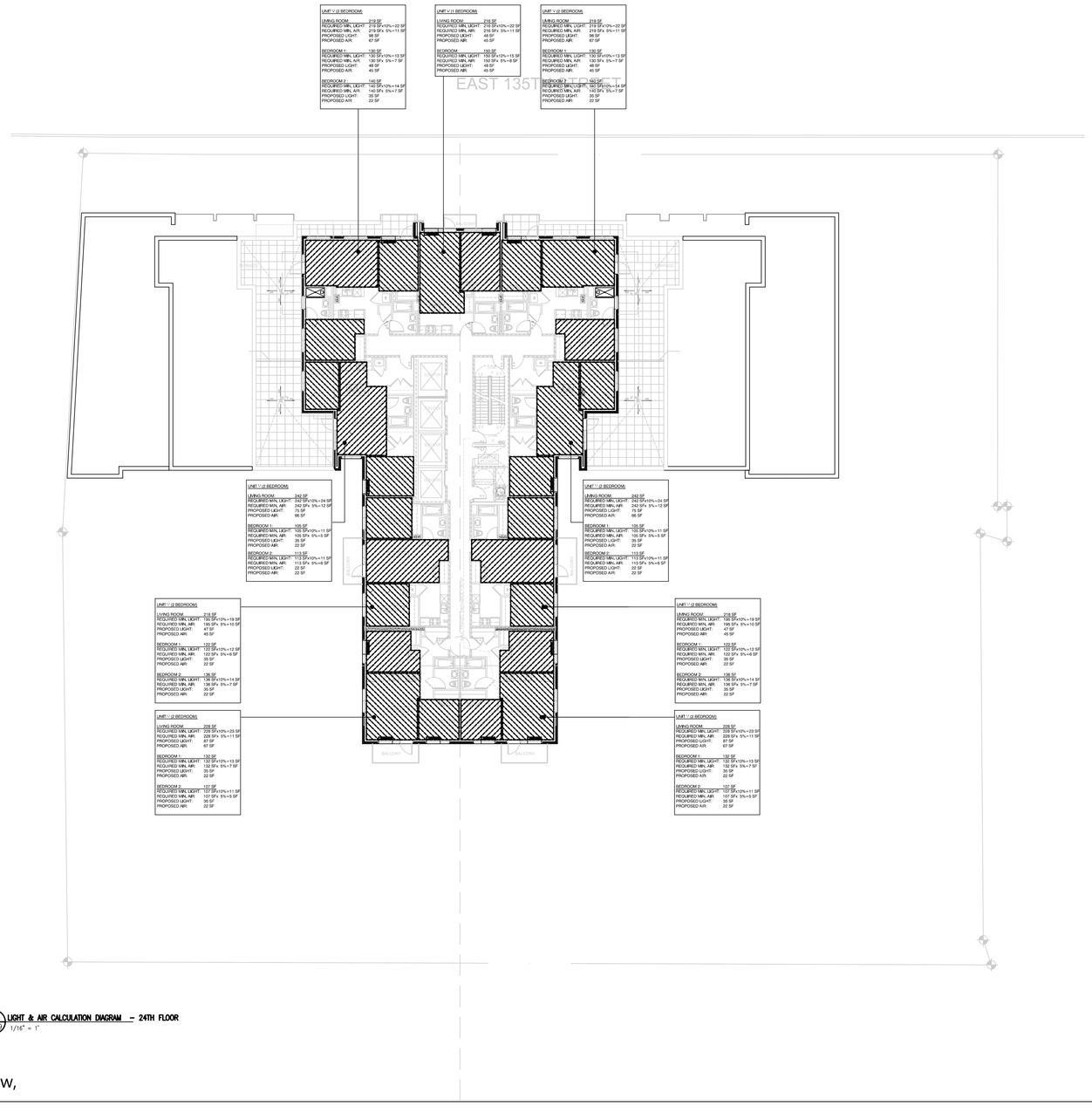
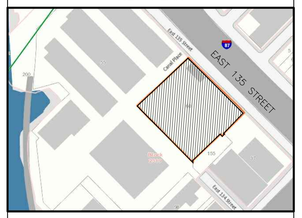


1 A-002 LIGHT & AIR CALCULATION DIAGRAM – 24TH FLOOR
1/16" = 1'

KEY PLAN



BLOCK: 2319 LOT: 60

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REGISTERED ARCHITECT KARL FISCHER 031282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
LIGHT & AIR CALCULATION DIAGRAM

dob no

scale: AS INDICATED	project no.: 15-23
date: 2015-07-09	sheet no.: 10 OF
drawn: VV	drawing no.: A-009.00
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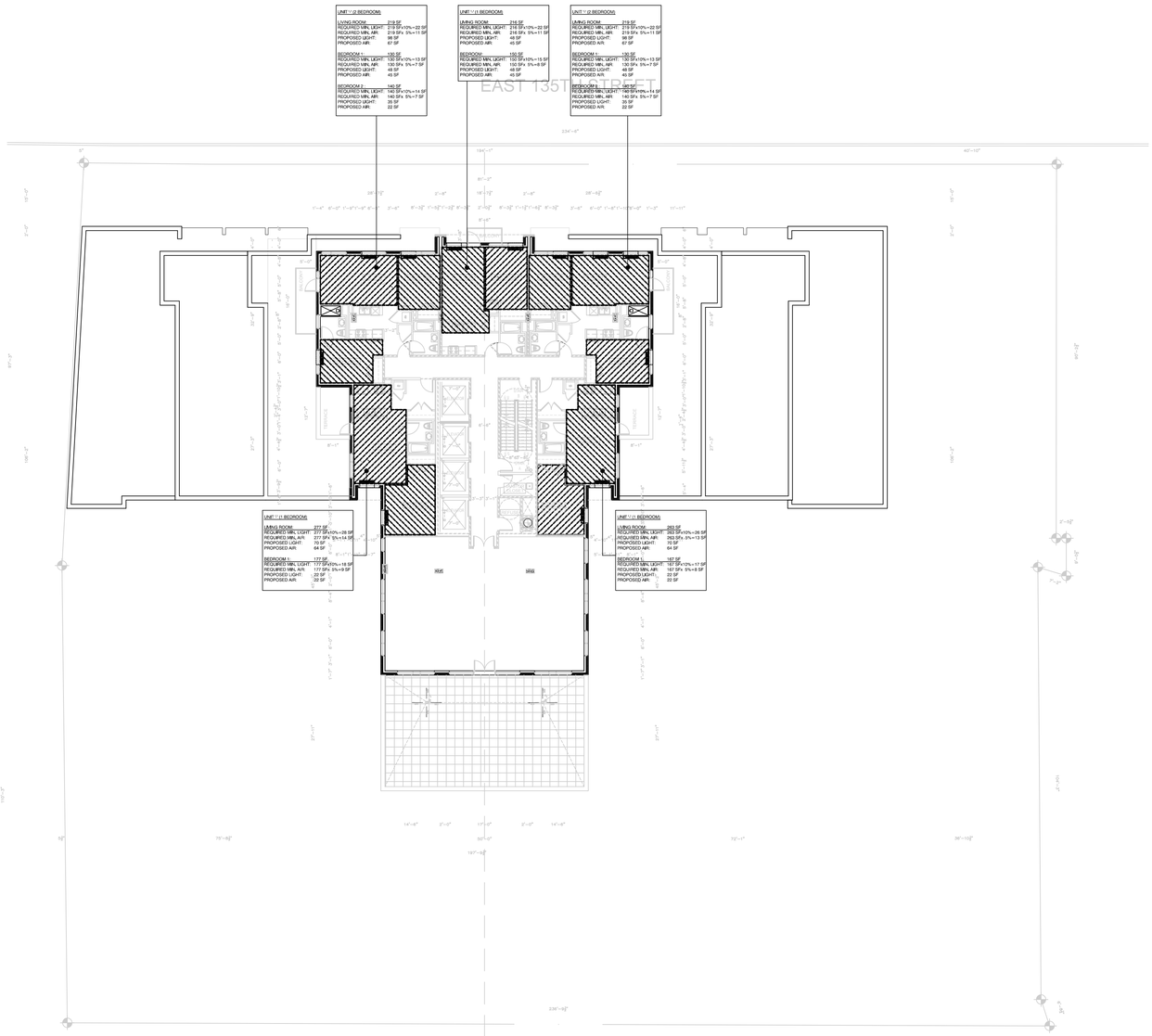

1 A-010 LIGHT & AIR CALCULATION DIAGRAM – 25TH FLOOR
1/16" = 1'

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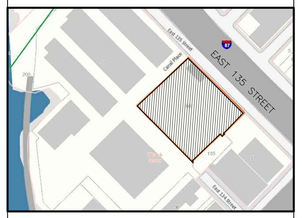
KEY PLAN



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project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

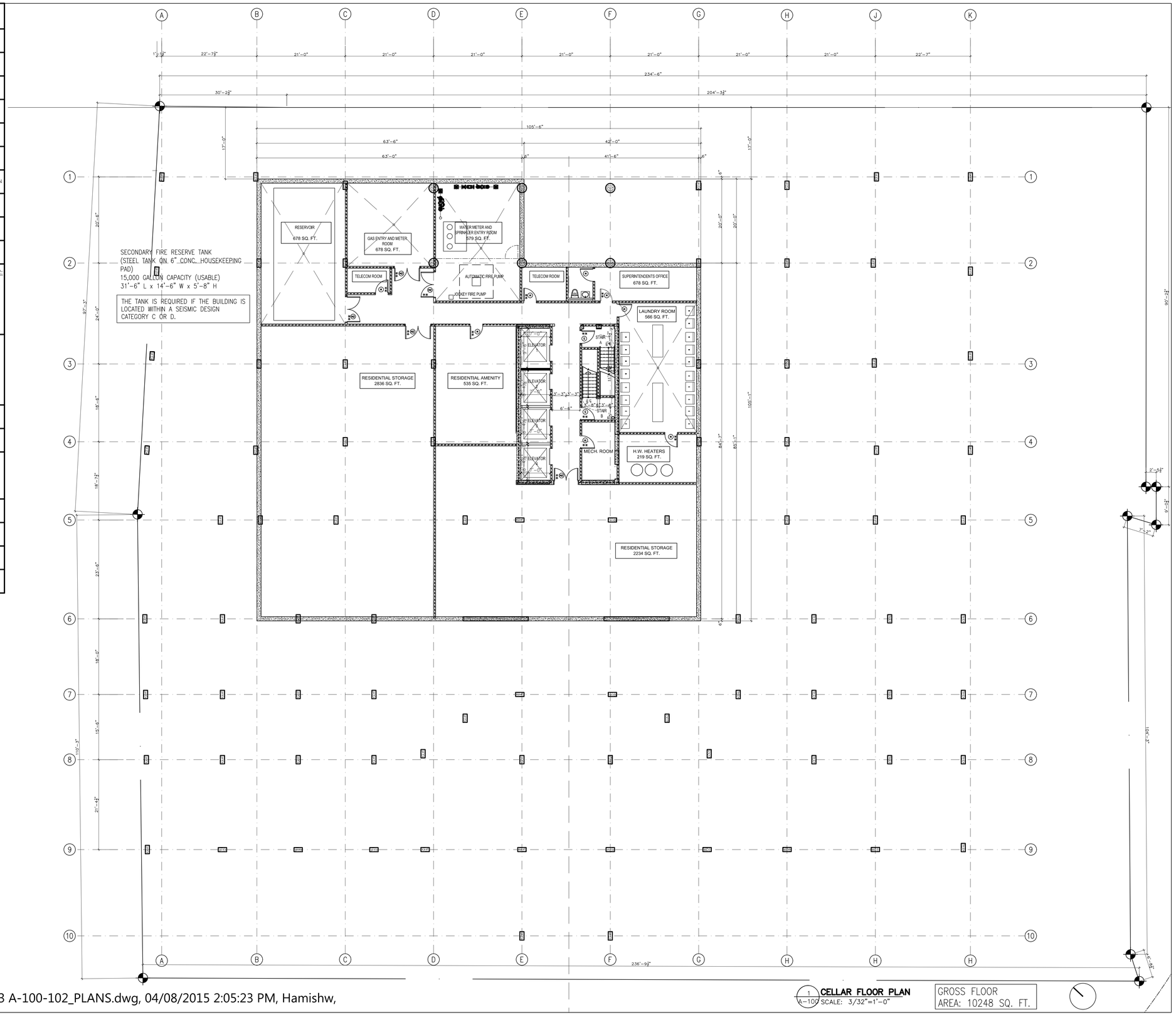
drawing title
LIGHT & AIR CALCULATION DIAGRAM

dob no

scale: AS INDICATED	project no.: 15–23
date: 2015–07–09	sheet no.: 10 OF
drawn: VV	drawing no.: A-010.00
checked: KF	

PLAN SYMBOLS - LEGEND

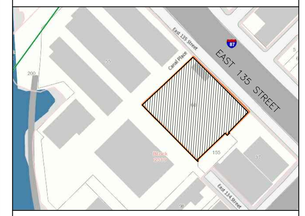
- GYPSUM BOARD WALL (GWB) NOT FIRE RATED SEE WALL TYPES
- 1 HR. FIRE RATED WALL SEE WALL TYPES
- 2 HR. FIRE RATED WALL SEE WALL TYPES
- 3 HR. FIRE RATED WALL SEE WALL TYPES
- C.M.U. WALL SEE WALL TYPES FOR FIRE RATING
- POURED IN PLACE CONCRETE WALL REFER TO STRUCTURAL DRAWINGS
- FUTURE OUTWARD DOOR SWING OF ADAPTABLE BATH ROOM ONCE THE DWELLING UNIT IS OCCUPIED BY PERSON W/ PHYSICAL DISABILITY.
- ** INDICATES 1 1/2 HR. FIRE RATED ULC LABELED DOOR AND PRESSED STEEL FRAME WITH DOOR CLOSER
- EXIT SIGN / EXIT SIGN W/ DIRECTION
- BATH ROOM MECH. VENTILATION
- REVISED AREA & REVISION NUMBER.
- NON-FREEZE WALL HOSE BIB "RECESSED"
- COMBINATION SMOKE & CARBON MONOXIDE DETECTOR: HARDWIRED SMOKE & CARBON MONOXIDE DETECTORS SHALL COMPLY WITH NYBC 907.2.9.1.3 & 908.7 AND SHALL BE PROVIDED ON THE CEILING OR WALL OUTSIDE OF EACH ROOM USED FOR SLEEPING PURPOSES WITHIN 15 FEET OF THE DOOR TO SUCH ROOM; IN EACH ROOM USED FOR SLEEPING PURPOSES; OR IN EACH STORY OF A DWELLING UNIT
- SMOKE DETECTOR: "e" DENOTES ELEVATOR RECALL
- T.D. = X-X" / MAX. = X-X" — ACTUAL T.D. (TRAVEL DISTANCE) / MAX. T.D. (TRAVEL DISTANCE) ALLOWED
- * INDICATES 3/4 HR. FIRE RATED ULC LABELED DOOR AND PRESSED STEEL FRAME WITH DOOR CLOSER
- WINDOW TAG — DETAIL NUMBER / ENLARGE DETAIL / SHEET NUMBER
- DOOR TAG — ELEVATION NUMBER / BUILDING ELEVATION / SHEET NUMBER
- WALL TAG — SECTION NUMBER / BUILDING SECTION / SHEET NUMBER
- RAP — FIRE ALARM REMOTE ANNUNCIATOR PANEL
- F — FIRE ALARM MANUAL PULL STATION — SECTION NUMBER / DETAIL SECTION / SHEET NUMBER
- FAP — FIRE ALARM PANEL — EP — ELECTRIC PANEL
- CO — CARBON MONOXIDE SENSOR — H — HEAT DETECTOR
- HERE — 'YOU ARE HERE' SIGN — BXX — BALCONY TYPE



1 CELLAR FLOOR PLAN
A-100 SCALE: 3/32"=1'-0"

GROSS FLOOR AREA: 10248 SQ. FT.

KEY PLAN



BLOCK: 2319 LOT: 60

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RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
CELLAR FLOOR PLAN

dob no

scale 3/32"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
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checked KF	

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- 1 HR. FIRE RATED WALL SEE WALL TYPES
- 2 HR. FIRE RATED WALL SEE WALL TYPES
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- EXIT SIGN / EXIT SIGN W/ DIRECTION
- BATH ROOM MECH. VENTILATION
- REVISED AREA & REVISION NUMBER.
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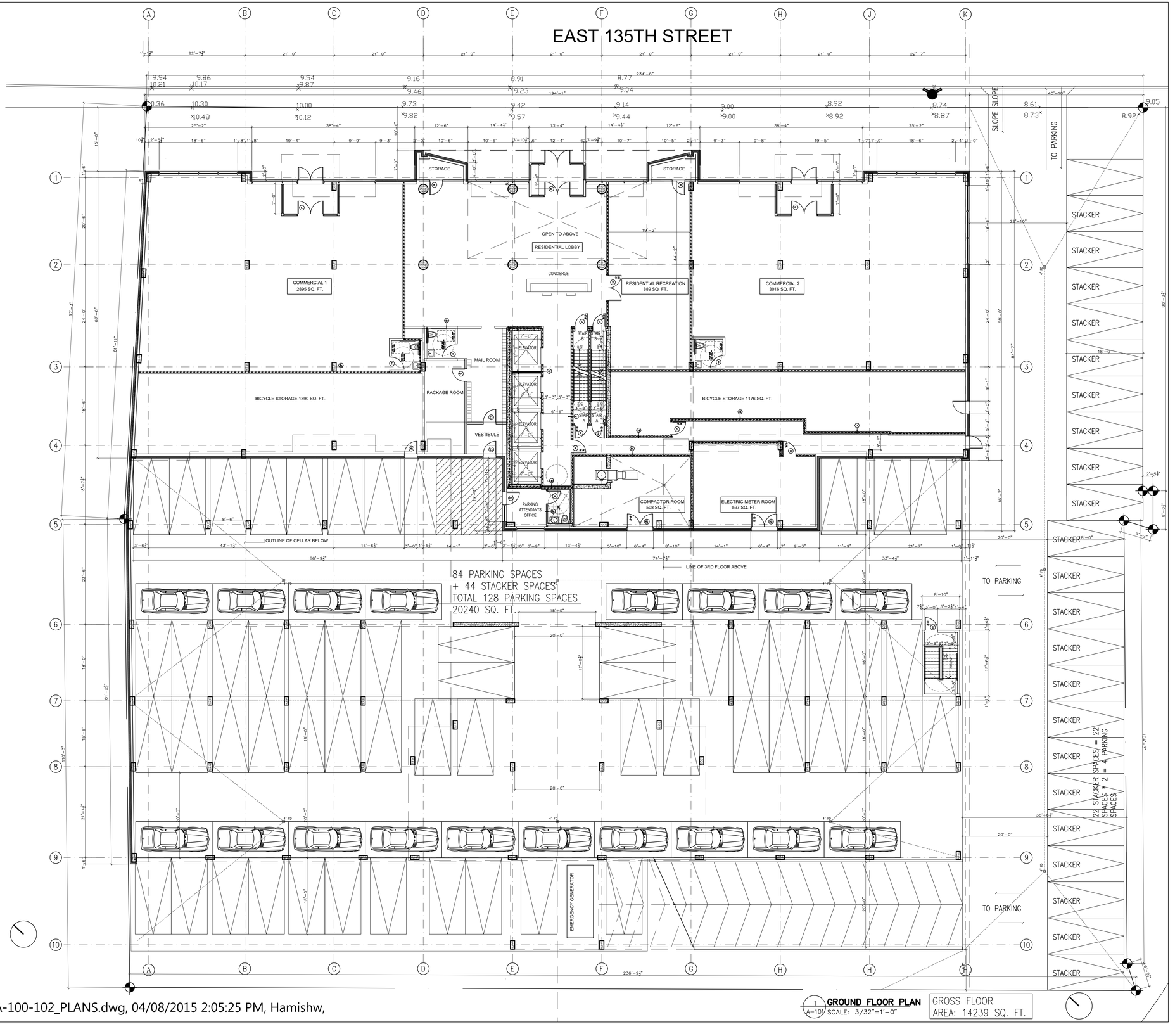
- SMOKE DETECTOR: "e" DENOTES ELEVATOR RECALL
- T.D. = X-X" / MAX. = X-X" — ACTUAL T.D. (TRAVEL DISTANCE) / MAX. T.D. (TRAVEL DISTANCE) ALLOWED

* INDICATES 3/4 HR. FIRE RATED ULC LABELED DOOR AND PRESSED STEEL FRAME WITH DOOR CLOSER

- WINDOW TAG — DETAIL NUMBER / ENLARGE DETAIL / SHEET NUMBER
- DOOR TAG — ELEVATION NUMBER / BUILDING ELEVATION / SHEET NUMBER
- WALL TAG — SECTION NUMBER / BUILDING SECTION / SHEET NUMBER
- RAP — FIRE ALARM REMOTE ANNUNCIATOR PANEL
- F — FIRE ALARM MANUAL PULL STATION — SECTION NUMBER / DETAIL SECTION / SHEET NUMBER
- FAP — FIRE ALARM PANEL — EP — ELECTRIC PANEL
- CO — CARBON MONOXIDE SENSOR — H — HEAT DETECTOR
- HERE — 'YOU ARE HERE' SIGN — BXX — BALCONY TYPE

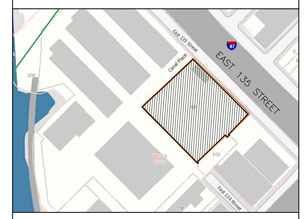
EAST 135TH STREET



1 GROUND FLOOR PLAN
A-101 SCALE: 3/32"=1'-0"

GROSS FLOOR AREA: 14239 SQ. FT.

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

ISSUES/REVISIONS

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SEAL

REGISTERED ARCHITECT KARL FISCHER 091282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
GROUND FLOOR PLAN

dob no

scale	3/32"=1'-0"	project no.	15-23
date	2014-04-02	sheet no.	OF
drawn		drawing no.	A-101.00
checked	KF		

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PLAN SYMBOLS - LEGEND

- GYPSUM BOARD WALL (GWB) NOT FIRE RATED SEE WALL TYPES
- 1 HR. FIRE RATED WALL SEE WALL TYPES
- 2 HR. FIRE RATED WALL SEE WALL TYPES
- 3 HR. FIRE RATED WALL SEE WALL TYPES
- C.M.U. WALL SEE WALL TYPES FOR FIRE RATING
- POURED IN PLACE CONCRETE WALL REFER TO STRUCTURAL DRAWINGS
- FUTURE OUTWARD DOOR SWING OF ADAPTABLE BATH ROOM ONCE THE DWELLING UNIT IS OCCUPIED BY PERSON W/ PHYSICAL DISABILITY.
- ** INDICATES 1 1/2 HR. FIRE RATED ULC LABELED DOOR AND PRESSED STEEL FRAME WITH DOOR CLOSER
- EXIT SIGN / EXIT SIGN W/ DIRECTION
- BATH ROOM MECH. VENTILATION
- REVISED AREA & REVISION NUMBER.
- NON-FREEZE WALL HOSE BIB "RECESSED"
- COMBINATION SMOKE & CARBON MONOXIDE DETECTOR: HARDWIRED SMOKE & CARBON MONOXIDE DETECTORS SHALL COMPLY WITH NYBC 907.2.9.1.3 & 908.7 AND SHALL BE PROVIDED ON THE CEILING OR WALL OUTSIDE OF EACH ROOM USED FOR SLEEPING PURPOSES WITHIN 15 FEET OF THE DOOR TO SUCH ROOM; IN EACH ROOM USED FOR SLEEPING PURPOSES; OR IN EACH STORY OF A DWELLING UNIT
- SMOKE DETECTOR: "e" DENOTES ELEVATOR RECALL
- T.D. = X-X" / MAX. = X-X" — ACTUAL T.D. (TRAVEL DISTANCE) / MAX. T.D. (TRAVEL DISTANCE) ALLOWED
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- RAP FIRE ALARM REMOTE ANNUNCIATOR PANEL
- F FIRE ALARM MANUAL PULL STATION — SECTION NUMBER / DETAIL SECTION / SHEET NUMBER
- FAP FIRE ALARM PANEL — EP ELECTRIC PANEL
- CO CARBON MONOXIDE SENSOR — H HEAT DETECTOR
- HERE 'YOU ARE HERE' SIGN — BXX BALCONY TYPE

EAST 135TH STREET

OPEN TO BELOW

BICYCLE STORAGE 485 SQ. FT.

BICYCLE STORAGE 518 SQ. FT.

ELEVATOR LOBBY

H.W. TANK ROOM

H.W. TANK

77 PARKING SPACES

LINE OF 3RD FLOOR ABOVE

TO PARKING

1 SECOND FLOOR PLAN
A-102 SCALE: 3/32"=1'-0"

GROSS FLOOR AREA: 31784 SQ. FT.

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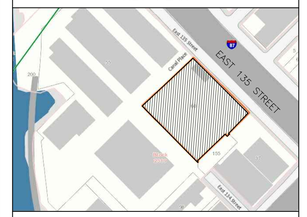
KEY PLAN



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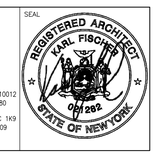
SEAL



project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
SECOND FLOOR PLAN

dob no

scale 3/32"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. A-102.00
checked KF	

PLAN SYMBOLS - LEGEND

GYPSUM BOARD WALL (GWB) NOT FIRE RATED SEE WALL TYPES

1 HR. FIRE RATED WALL SEE WALL TYPES

2 HR. FIRE RATED WALL SEE WALL TYPES

3 HR. FIRE RATED WALL SEE WALL TYPES

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FUTURE OUTWARD DOOR SWING OF ADAPTABLE BATH ROOM ONCE THE DWELLING UNIT IS OCCUPIED BY PERSON W/ PHYSICAL DISABILITY.

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EXIT SIGN
EXIT SIGN W/ DIRECTION

BATH ROOM MECH. VENTILATION

REVISED AREA & REVISION NUMBER.

HB NON-FREEZE WALL HOSE BIB "RECESSED"

S/C COMBINATION SMOKE & CARBON MONOXIDE DETECTOR: HARDWIRED SMOKE & CARBON MONOXIDE DETECTORS SHALL COMPLY WITH NYBC 907.2.9.1.3 & 908.7 AND SHALL BE PROVIDED ON THE CEILING OR WALL OUTSIDE OF EACH ROOM USED FOR SLEEPING PURPOSES WITHIN 15 FEET OF THE DOOR TO SUCH ROOM; IN EACH ROOM USED FOR SLEEPING PURPOSES; OR IN EACH STORY OF A DWELLING UNIT

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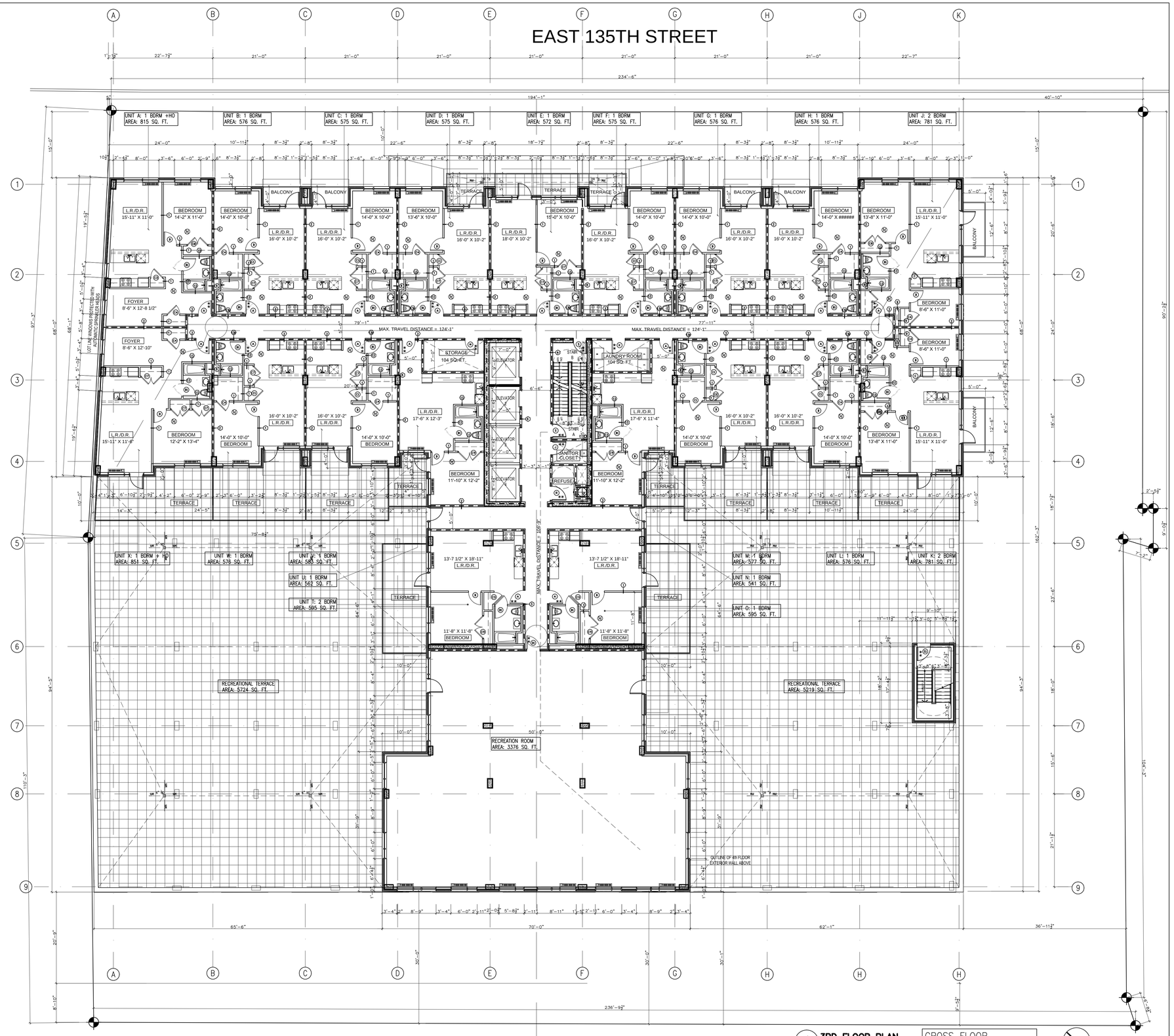
X WALL TAG	SECTION NUMBER BUILDING SECTION SHEET NUMBER
RAP FIRE ALARM REMOTE ANNUNCIATOR PANEL	
F FIRE ALARM MANUAL PULL STATION	SECTION NUMBER DETAIL SECTION SHEET NUMBER
FAP FIRE ALARM PANEL	EP ELECTRIC PANEL
CO CARBON MONOXIDE SENSOR	H HEAT DETECTOR
HERE 'YOU ARE HERE' SIGN	BXX BALCONY TYPE

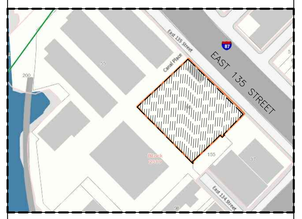
EAST 135TH STREET



1 A-103 **3RD FLOOR PLAN** SCALE: 3/32"=1'-0"

GROSS FLOOR AREA: 17702 SQ. FT.

KEY PLAN



BLOCK: 2319 LOT: 60

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ISSUES/REVISIONS

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SEAL
REGISTERED ARCHITECT KARL FISCHER 021282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
3RD FLOOR PLAN

dob no

scale 3/32"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. A103.00
checked KF	

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PLAN SYMBOLS - LEGEND

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- 1 HR. FIRE RATED WALL SEE WALL TYPES
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- BATH ROOM MECH. VENTILATION
- REVISED AREA & REVISION NUMBER
- HB NON-FREEZE WALL HOSE BIB "RECESSED"
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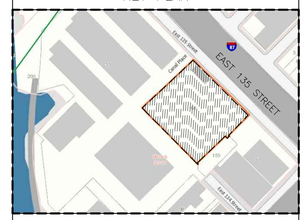
- FAP FIRE ALARM PANEL — EP ELECTRIC PANEL
- CO CARBON MONOXIDE SENSOR — H HEAT DETECTOR
- HERE 'YOU ARE HERE' SIGN — BXX BALCONY TYPE

EAST 135TH STREET

1 **4TH FLOOR PLAN** A-104 SCALE: 3/32"=1'-0"

GROSS FLOOR AREA: 17702 SQ. FT.

KEY PLAN



BLOCK: 2319 LOT: 60

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SEAL: REGISTERED ARCHITECT KARL FISCHER 031282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
FLOOR PLAN
FLOOR 4

dob no

scale 3/32"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. A104.00
checked KF	

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PLAN SYMBOLS - LEGEND

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- 1 HR. FIRE RATED WALL SEE WALL TYPES
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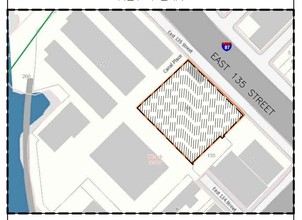
- FAP FIRE ALARM PANEL — EP ELECTRIC PANEL
- CO CARBON MONOXIDE SENSOR — H HEAT DETECTOR
- HERE 'YOU ARE HERE' SIGN — BXX BALCONY TYPE

EAST 135TH STREET

1 5TH TO 11TH FLOORS PLAN
A-105 SCALE: 3/32"=1'-0"

GROSS FLOOR AREA: 17702 SQ. FT.

KEY PLAN



BLOCK: 2319 LOT: 60

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SEAL: REGISTERED ARCHITECT KARL FISCHER 087282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
TYPICAL FLOOR PLAN
FLOORS 5-10

dob no

scale 3/32"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. A105.00
checked KF	

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- S SMOKE DETECTOR: "e" DENOTES ELEVATOR RECALL
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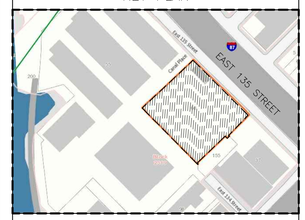
- * INDICATES 3/4 HR. FIRE RATED ULC LABELED DOOR AND PRESSED STEEL FRAME WITH DOOR CLOSER
- XXX WINDOW TAG — DETAIL NUMBER / ENLARGE DETAIL / SHEET NUMBER
- X DOOR TAG — ELEVATION NUMBER / BUILDING ELEVATION / SHEET NUMBER
- X WALL TAG — SECTION NUMBER / BUILDING SECTION / SHEET NUMBER
- RAP FIRE ALARM REMOTE ANNUNCIATOR PANEL
- F FIRE ALARM MANUAL PULL STATION — SECTION NUMBER – DETAIL SECTION / SHEET NUMBER
- FAP FIRE ALARM PANEL — EP ELECTRIC PANEL
- CO CARBON MONOXIDE SENSOR — H HEAT DETECTOR
- HERE 'YOU ARE HERE' SIGN — BXX BALCONY TYPE

EAST 135TH STREET

1 **12TH FLOOR PLAN** A-110 SCALE: 3/32"=1'-0"

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
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ISSUES/REVISIONS

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project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
TYPICAL FLOOR PLAN
FLOOR 11

dob no

scale 3/32"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. A110.00
checked KF	

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PLAN SYMBOLS - LEGEND

- GYPSUM BOARD WALL (GWB) NOT FIRE RATED SEE WALL TYPES
- 1 HR. FIRE RATED WALL SEE WALL TYPES
- 2 HR. FIRE RATED WALL SEE WALL TYPES
- 3 HR. FIRE RATED WALL SEE WALL TYPES
- C.M.U. WALL SEE WALL TYPES FOR FIRE RATING
- POURED IN PLACE CONCRETE WALL REFER TO STRUCTURAL DRAWINGS
- FUTURE OUTWARD DOOR SWING OF ADAPTABLE BATH ROOM ONCE THE DWELLING UNIT IS OCCUPIED BY PERSON W/ PHYSICAL DISABILITY.

** INDICATES 1 1/2 HR. FIRE RATED ULC LABELED DOOR AND PRESSED STEEL FRAME WITH DOOR CLOSER

- EXIT SIGN / EXIT SIGN W/ DIRECTION
- BATH ROOM MECH. VENTILATION
- REVISED AREA & REVISION NUMBER
- NON-FREEZE WALL HOSE BIB "RECESSED"

COMBINATION SMOKE & CARBON MONOXIDE DETECTOR: HARDWIRED SMOKE & CARBON MONOXIDE DETECTORS SHALL COMPLY WITH NYBC 907.2.9.1.3 & 908.7 AND SHALL BE PROVIDED ON THE CEILING OR WALL OUTSIDE OF EACH ROOM USED FOR SLEEPING PURPOSES WITHIN 15 FEET OF THE DOOR TO SUCH ROOM; IN EACH ROOM USED FOR SLEEPING PURPOSES; OR IN EACH STORY OF A DWELLING UNIT

- SMOKE DETECTOR: "e" DENOTES ELEVATOR RECALL
- T.D. = X'-X" / MAX. = X'-X" — ACTUAL T.D. (TRAVEL DISTANCE) / MAX. T.D. (TRAVEL DISTANCE) ALLOWED

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- X — DOOR TAG — ELEVATION NUMBER / BUILDING ELEVATION SHEET NUMBER
- X — WALL TAG — SECTION NUMBER / BUILDING SECTION SHEET NUMBER
- RAP — FIRE ALARM REMOTE ANNUNCIATOR PANEL
- F — FIRE ALARM MANUAL PULL STATION — SECTION NUMBER – DETAIL SECTION SHEET NUMBER
- FAP — FIRE ALARM PANEL — EP — ELECTRIC PANEL
- CO — CARBON MONOXIDE SENSOR — H — HEAT DETECTOR
- HERE — 'YOU ARE HERE' SIGN — BXX — BALCONY TYPE

EAST 135TH STREET

UNIT A: 1 BDRM +HO AREA: 815 SQ. FT.
UNIT B: 1 BDRM AREA: 576 SQ. FT.
UNIT C: 1 BDRM AREA: 575 SQ. FT.
UNIT D: 1 BDRM AREA: 575 SQ. FT.
UNIT E: 1 BDRM AREA: 572 SQ. FT.
UNIT F: 1 BDRM AREA: 575 SQ. FT.
UNIT G: 1 BDRM AREA: 576 SQ. FT.
UNIT H: 1 BDRM AREA: 576 SQ. FT.
UNIT J: 2 BDRM AREA: 781 SQ. FT.
UNIT X: 1 BDRM + HO AREA: 851 SQ. FT.
UNIT W: 1 BDRM AREA: 576 SQ. FT.
UNIT V: 1 BDRM AREA: 583 SQ. FT.
UNIT U: 1 BDRM AREA: 538 SQ. FT.
UNIT T: 2 BDRM AREA: 733 SQ. FT.
UNIT Q: 2 BDRM AREA: 797 SQ. FT.
UNIT M: 1 BDRM AREA: 577 SQ. FT.
UNIT N: 1 BDRM AREA: 518 SQ. FT.
UNIT O: 2 BDRM AREA: 732 SQ. FT.
UNIT P: 2 BDRM AREA: 797 SQ. FT.
UNIT L: 1 BDRM AREA: 576 SQ. FT.
UNIT K: 2 BDRM AREA: 781 SQ. FT.

MAX. TRAVEL DISTANCE = 124'-1"
MAX. TRAVEL DISTANCE = 124'-1"
MAX. TRAVEL DISTANCE = 130'-0"
LOT LINE WINDOWS
LINE OF WALL ABOVE AT 13TH FLOOR
GROSS FLOOR AREA: 15915 SQ. FT.

1 A-111 **12TH FLOOR PLAN** SCALE: 3/32"=1'-0"

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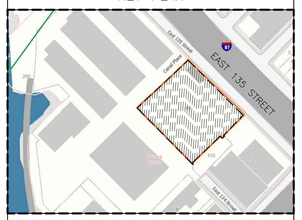
KEY PLAN



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SEAL: REGISTERED ARCHITECT KARL FISCHER 031282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
12TH FLOOR PLAN

dob no

scale 3/32"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. A111.00
checked KF	

PLAN SYMBOLS - LEGEND

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** INDICATES 1 1/2 HR. FIRE RATED ULC LABELED DOOR AND PRESSED STEEL FRAME WITH DOOR CLOSER

- EXIT SIGN / EXIT SIGN W/ DIRECTION
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- REVISED AREA & REVISION NUMBER
- HB NON-FREEZE WALL HOSE BIB "RECESSED"

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- S SMOKE DETECTOR
- Se "e" DENOTES ELEVATOR RECALL

T.D. = X-X" / MAX. = X-X" ACTUAL T.D. (TRAVEL DISTANCE) / MAX. T.D. (TRAVEL DISTANCE) ALLOWED

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- FAP FIRE ALARM PANEL — EP ELECTRIC PANEL
- CO CARBON MONOXIDE SENSOR — H HEAT DETECTOR
- HERE 'YOU ARE HERE' SIGN — BXX BALCONY TYPE

EAST 135TH STREET

UNIT A: 1 BDRM +HO AREA: 815 SQ. FT.
UNIT B: 1 BDRM AREA: 576 SQ. FT.
UNIT C: 1 BDRM AREA: 575 SQ. FT.
UNIT D: 1 BDRM AREA: 575 SQ. FT.
UNIT E: 1 BDRM AREA: 572 SQ. FT.
UNIT F: 1 BDRM AREA: 575 SQ. FT.
UNIT G: 1 BDRM AREA: 576 SQ. FT.
UNIT H: 1 BDRM AREA: 576 SQ. FT.
UNIT J: 2 BDRM AREA: 781 SQ. FT.
UNIT K: 2 BDRM AREA: 781 SQ. FT.
UNIT L: 1 BDRM AREA: 576 SQ. FT.
UNIT M: 1 BDRM AREA: 577 SQ. FT.
UNIT N: 1 BDRM AREA: 518 SQ. FT.
UNIT O: 2 BDRM AREA: 732 SQ. FT.
UNIT P: 2 BDRM AREA: 720 SQ. FT.
UNIT Q: 2 BDRM AREA: 720 SQ. FT.
UNIT R: 1 BDRM AREA: 538 SQ. FT.
UNIT S: 2 BDRM AREA: 733 SQ. FT.
UNIT V: 1 BDRM AREA: 583 SQ. FT.
UNIT W: 1 BDRM AREA: 576 SQ. FT.
UNIT X: 1 BDRM + HO AREA: 851 SQ. FT.

MECH. ROOM 104 SQ.FT.
LAUNDRY ROOM 104 SQ.FT.
JANITOR CLOSET
REFUSE
ELEVATOR
STAIR
PRIVACY SCREEN
LOT LINE WINDOWS

1 13TH FLOOR PLAN
A-112 SCALE: 3/32"=1'-0"

GROSS FLOOR AREA: 15760 SQ. FT.

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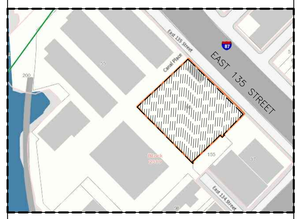
KEY PLAN



BLOCK: 2319 LOT: 60

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SEAL: REGISTERED ARCHITECT KARL FISCHER 087282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
13TH FLOOR PLAN

dob no

scale 3/32"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. A112.00
checked KF	

PLAN SYMBOLS - LEGEND

- GYPSUM BOARD WALL (GWB) NOT FIRE RATED SEE WALL TYPES
- 1 HR. FIRE RATED WALL SEE WALL TYPES
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- REVISED AREA & REVISION NUMBER
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- (S) SMOKE DETECTOR
- (S)e "e" DENOTES ELEVATOR RECALL

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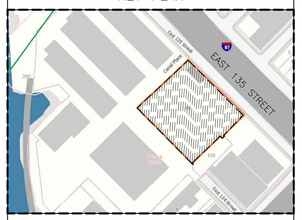
- CO CARBON MONOXIDE SENSOR — (H) HEAT DETECTOR
- HERE 'YOU ARE HERE' SIGN — BXX BALCONY TYPE

EAST 135TH STREET

1 A-113 **14TH–20TH FLOOR PLANS**
SCALE: 3/32"=1'-0"

GROSS FLOOR AREA: 15760 SQ. FT.

KEY PLAN



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project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
14TH-20TH FLOOR PLANS

dob no

scale 3/32"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. A113.00
checked KF	

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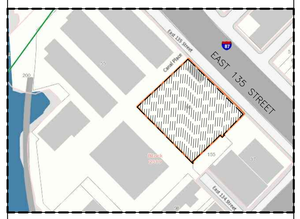
- FAP FIRE ALARM PANEL — EP ELECTRIC PANEL
- CO CARBON MONOXIDE SENSOR — H HEAT DETECTOR
- HERE 'YOU ARE HERE' SIGN — BXX BALCONY TYPE

EAST 135TH STREET

1 **21ST FLOOR PLAN**
A-115 SCALE: 3/32"=1'-0"

GROSS FLOOR AREA: 16010 SQ. FT.

KEY PLAN



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project title
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200 EAST 135TH ST. BRONX, NEW YORK

drawing title
21ST FLOOR PLAN

dob no

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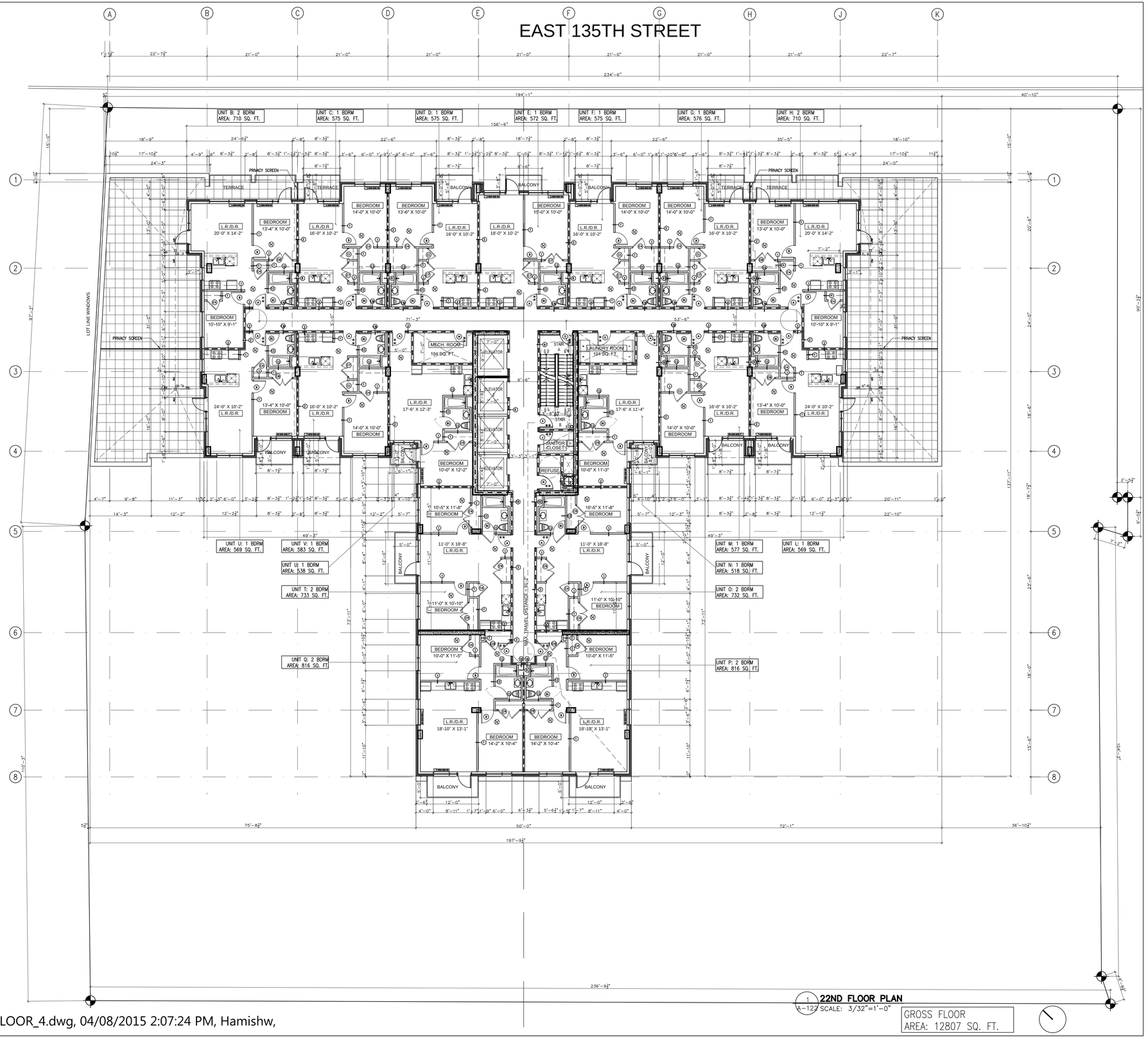
- POURED IN PLACE CONCRETE WALL REFER TO STRUCTURAL DRAWINGS
- FUTURE OUTWARD DOOR SWING OF ADAPTABLE BATH ROOM ONCE THE DWELLING UNIT IS OCCUPIED BY PERSON W/ PHYSICAL DISABILITY.
- ** INDICATES 1 1/2 HR. FIRE RATED ULC LABELED DOOR AND PRESSED STEEL FRAME WITH DOOR CLOSER
- EXIT SIGN / EXIT SIGN W/ DIRECTION
- BATH ROOM MECH. VENTILATION
- REVISED AREA & REVISION NUMBER
- HB NON-FREEZE WALL HOSE BIB "RECESSED"
- COMBINATION SMOKE & CARBON MONOXIDE DETECTOR: HARDWIRED SMOKE & CARBON MONOXIDE DETECTORS SHALL COMPLY WITH NYBC 907.2.9.1.3 & 908.7 AND SHALL BE PROVIDED ON THE CEILING OR WALL OUTSIDE OF EACH ROOM USED FOR SLEEPING PURPOSES WITHIN 15 FEET OF THE DOOR TO SUCH ROOM; IN EACH ROOM USED FOR SLEEPING PURPOSES; OR IN EACH STORY OF A DWELLING UNIT
- S SMOKE DETECTOR; Se "e" DENOTES ELEVATOR RECALL
- T.D. = X-X' / MAX. = X-X' ACTUAL T.D. (TRAVEL DISTANCE) / MAX. T.D. (TRAVEL DISTANCE) ALLOWED
- * INDICATES 3/4 HR. FIRE RATED ULC LABELED DOOR AND PRESSED STEEL FRAME WITH DOOR CLOSER
- XXX WINDOW TAG — DETAIL NUMBER / ENLARGE DETAIL / SHEET NUMBER
- X DOOR TAG — ELEVATION NUMBER / BUILDING ELEVATION / SHEET NUMBER
- X WALL TAG — SECTION NUMBER / BUILDING SECTION / SHEET NUMBER
- RAP FIRE ALARM REMOTE ANNUNCIATOR PANEL
- F FIRE ALARM MANUAL PULL STATION — SECTION NUMBER / DETAIL SECTION / SHEET NUMBER
- FAP FIRE ALARM PANEL — EP ELECTRIC PANEL
- CO CARBON MONOXIDE SENSOR — H HEAT DETECTOR
- HERE 'YOU ARE HERE' SIGN — BXX BALCONY TYPE

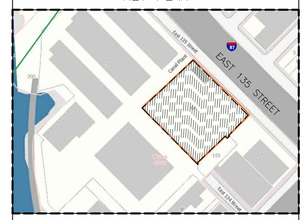
EAST 135TH STREET



1 **22ND FLOOR PLAN**
A-122 SCALE: 3/32"=1'-0"

GROSS FLOOR AREA: 12807 SQ. FT.

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
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ISSUES/REVISIONS

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project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
22ND FLOOR PLAN

dob no

scale 3/32"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. A122.00
checked KF	

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PLAN SYMBOLS - LEGEND

- GYPSUM BOARD WALL (GWB) NOT FIRE RATED SEE WALL TYPES
- 1 HR. FIRE RATED WALL SEE WALL TYPES
- 2 HR. FIRE RATED WALL SEE WALL TYPES
- 3 HR. FIRE RATED WALL SEE WALL TYPES
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- S/e SMOKE DETECTOR: "e" DENOTES ELEVATOR RECALL
- T.D. = X-X- / MAX. = X-X- ACTUAL T.D. (TRAVEL DISTANCE) / MAX. T.D. (TRAVEL DISTANCE) ALLOWED
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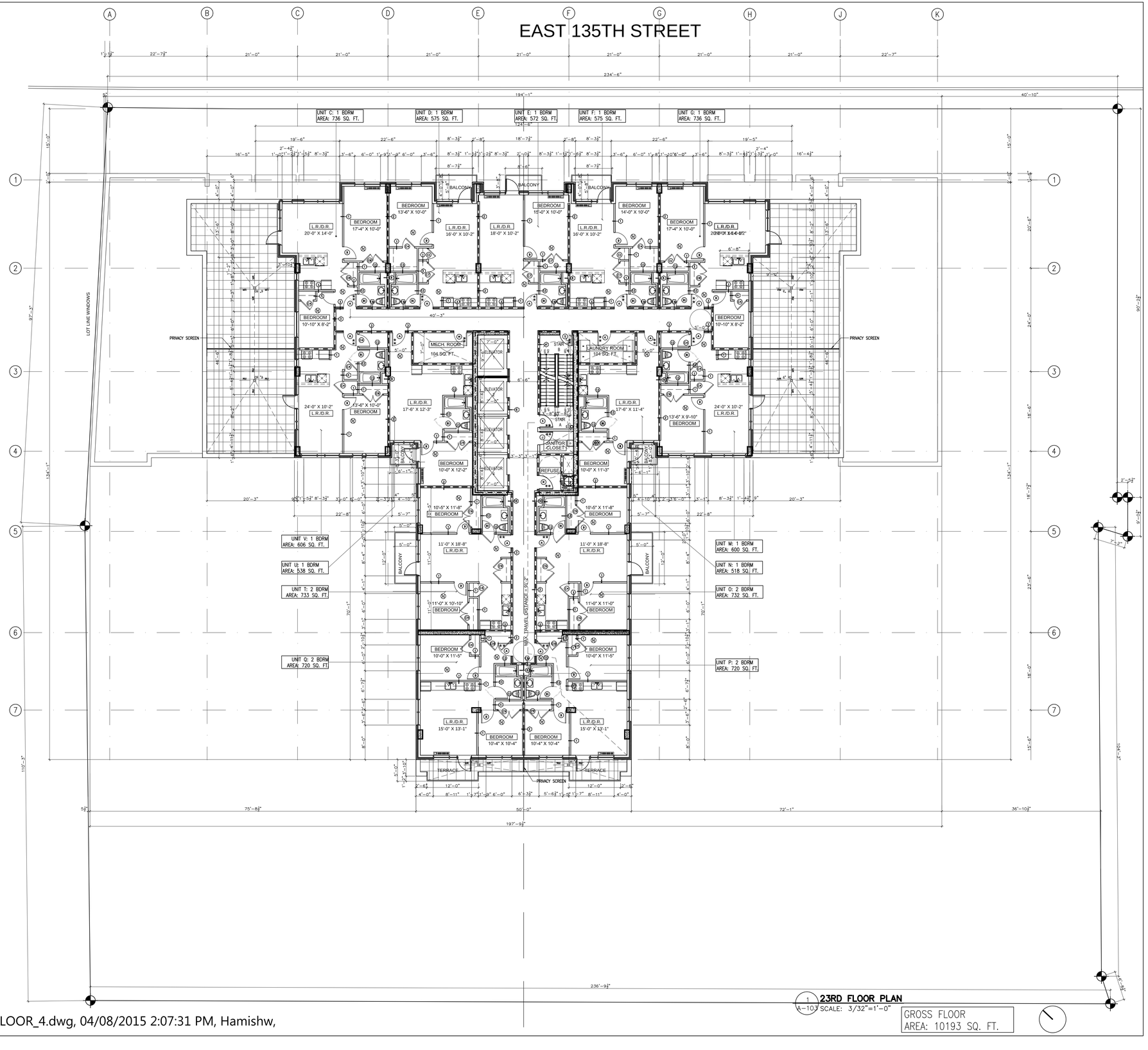
- CO CARBON MONOXIDE SENSOR — H HEAT DETECTOR
- HERE 'YOU ARE HERE' SIGN — BXX BALCONY TYPE

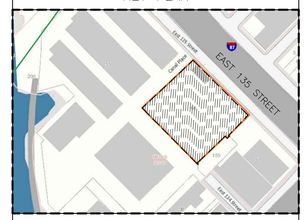
EAST 135TH STREET



1 **23RD FLOOR PLAN**
A-103 SCALE: 3/32"=1'-0"

GROSS FLOOR AREA: 10193 SQ. FT.

KEY PLAN



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project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
23RD FLOOR PLAN

dob no

scale 3/32"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. A123.00
checked KF	

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PLAN SYMBOLS - LEGEND

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- REVISED AREA & REVISION NUMBER
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- ELEVATION NUMBER / BUILDING ELEVATION / SHEET NUMBER
- X WALL TAG
- SECTION NUMBER / BUILDING SECTION / SHEET NUMBER
- RAP FIRE ALARM REMOTE ANNUNCIATOR PANEL
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- SECTION NUMBER – DETAIL SECTION / SHEET NUMBER
- FAP FIRE ALARM PANEL
- EP ELECTRIC PANEL
- CO CARBON MONOXIDE SENSOR
- H HEAT DETECTOR
- HERE 'YOU ARE HERE' SIGN
- BXX BALCONY TYPE

EAST 135TH STREET

UNIT D: 2 BDRM AREA: 869 SQ. FT.
UNIT E: 1 BDRM AREA: 572 SQ. FT.
UNIT F: 2 BDRM AREA: 869 SQ. FT.
UNIT U: 1 BDRM AREA: 772 SQ. FT.
UNIT N: 1 BDRM AREA: 742 SQ. FT.
UNIT T: 2 BDRM AREA: 733 SQ. FT.
UNIT O: 2 BDRM AREA: 732 SQ. FT.
UNIT Q: 2 BDRM AREA: 720 SQ. FT.
UNIT P: 2 BDRM AREA: 720 SQ. FT.

TERRACE
PRIVACY SCREEN
BALCONY
MIN. TRAVEL DISTANCE 50'-0"
GYPSUM BOARD WALL (GWB) NOT FIRE RATED SEE WALL TYPES

1 **24TH FLOOR PLAN**
A-103 SCALE: 3/32"=1'-0"

GROSS FLOOR AREA: 8140 SQ. FT.

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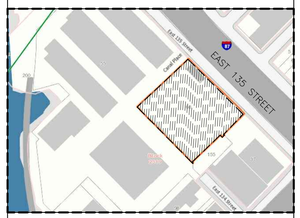
KEY PLAN



BLOCK: 2319 LOT: 60

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project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
24TH FLOOR PLAN

dob no

scale 3/32"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. A124.00
checked KF	

EAST 135TH STREET

PLAN SYMBOLS - LEGEND

- GYPSUM BOARD WALL (GWB) NOT FIRE RATED SEE WALL TYPES
- 1 HR. FIRE RATED WALL SEE WALL TYPES
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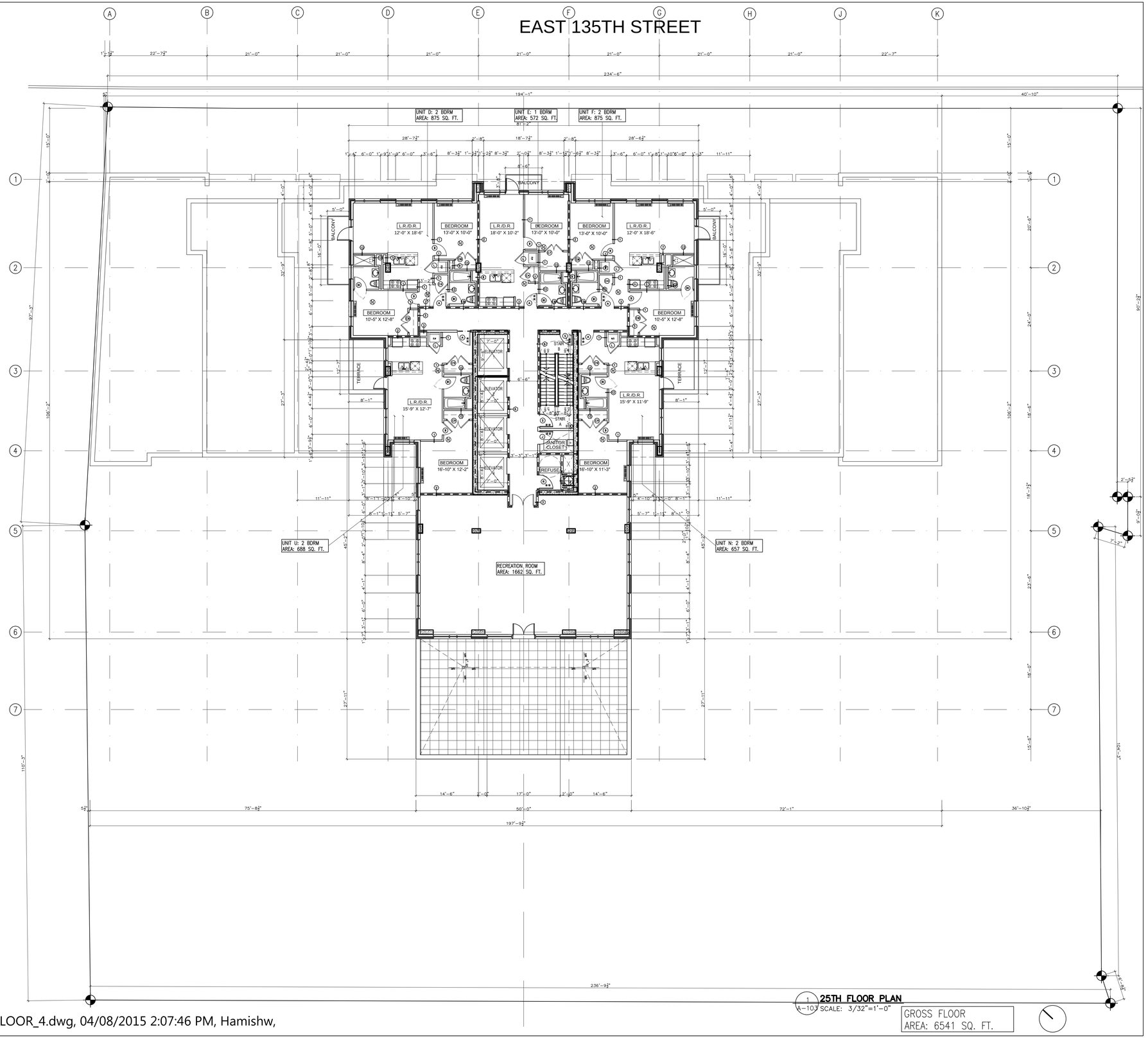
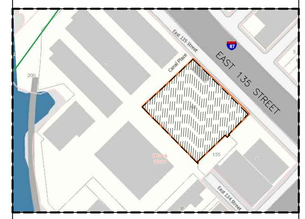
- * INDICATES 3/4 HR. FIRE RATED ULC LABELED DOOR AND PRESSED STEEL FRAME WITH DOOR CLOSER
- XXX — WINDOW TAG
- X — DOOR TAG
- X — WALL TAG
- RAP — FIRE ALARM REMOTE ANNUNCIATOR PANEL
- F — FIRE ALARM MANUAL PULL STATION
- FAP — FIRE ALARM PANEL
- CO — CARBON MONOXIDE SENSOR
- HERE — "YOU ARE HERE" SIGN
- DETAIL NUMBER / ENLARGE DETAIL / SHEET NUMBER
- ELEVATION NUMBER / BUILDING ELEVATION / SHEET NUMBER
- SECTION NUMBER / BUILDING SECTION / SHEET NUMBER
- SECTION NUMBER / DETAIL SECTION / SHEET NUMBER
- EP — ELECTRIC PANEL
- H — HEAT DETECTOR
- BXX — BALCONY TYPE



1 A-101 **25TH FLOOR PLAN** SCALE: 3/32"=1'-0"

GROSS FLOOR AREA: 6541 SQ. FT.

KEY PLAN



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200 EAST 135TH ST. BRONX, NEW YORK

drawing title
25TH FLOOR PLAN

dob no

scale 3/32"=1'-0"	project no. 15-23
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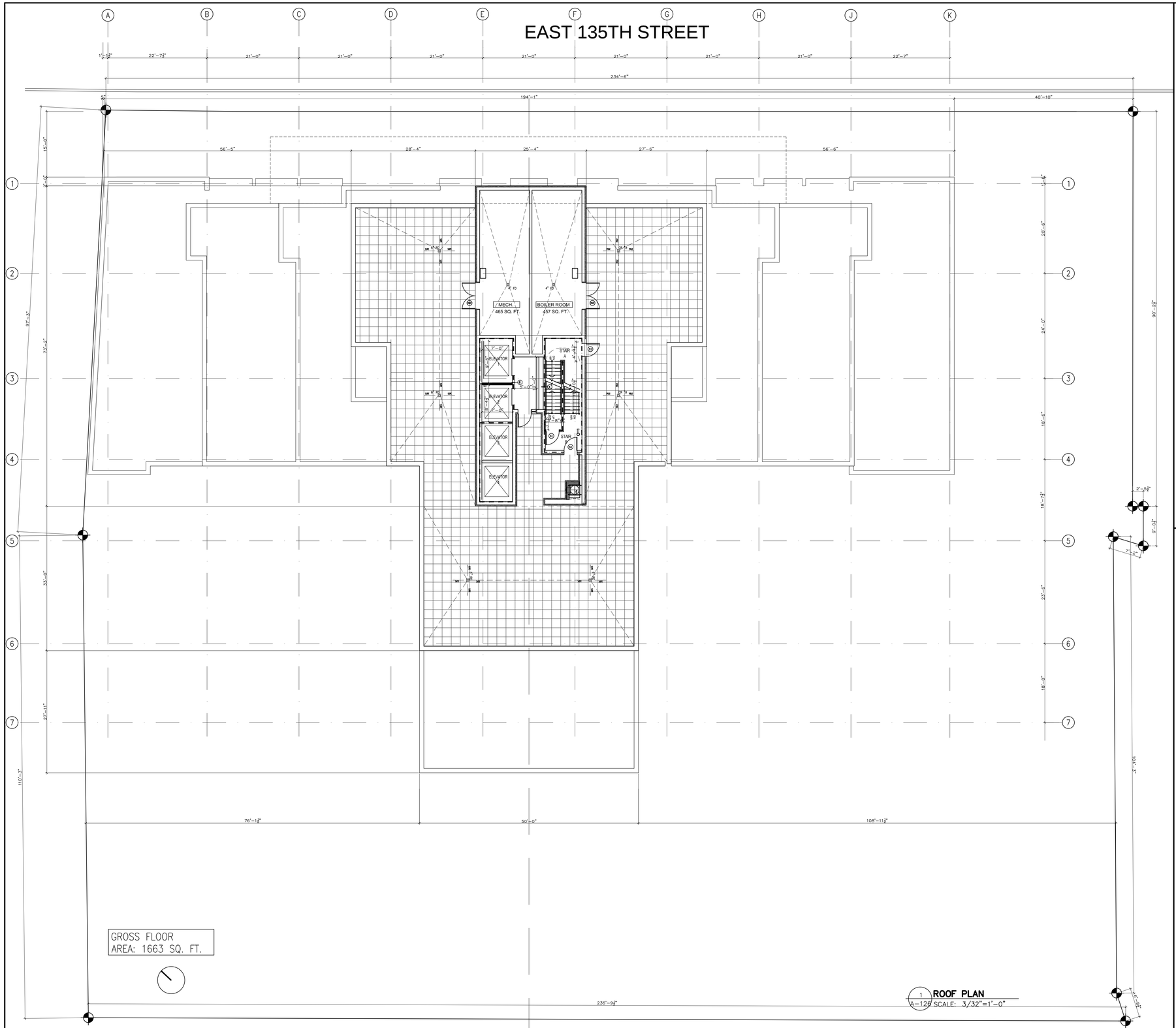
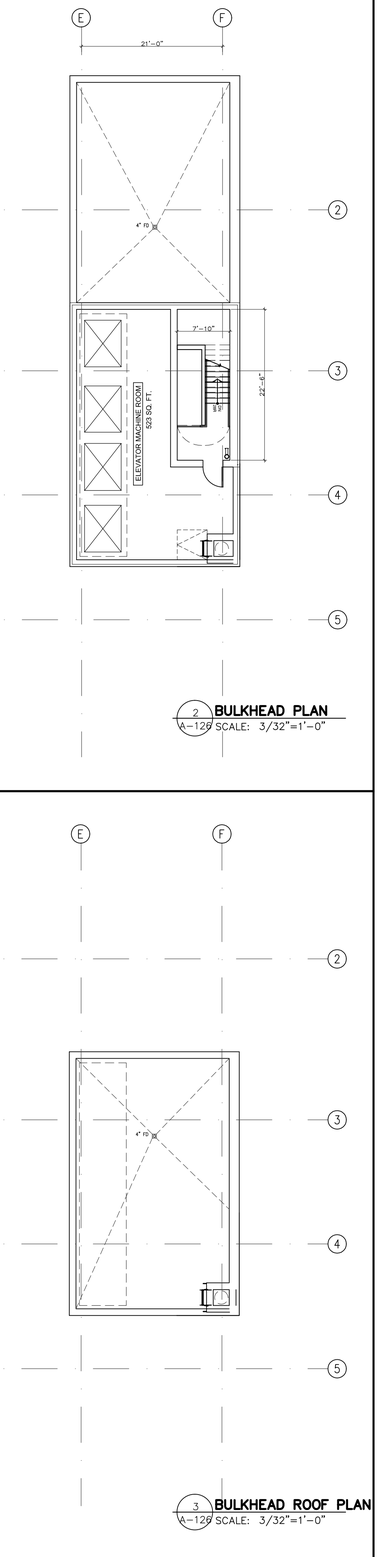
EAST 135TH STREET



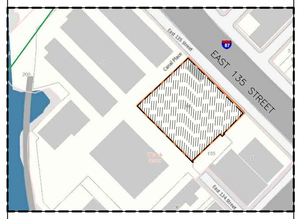
1 **ROOF PLAN**
A-126 SCALE: 3/32"=1'-0"



2 **BULKHEAD PLAN**
A-126 SCALE: 3/32"=1'-0"

3 **BULKHEAD ROOF PLAN**
A-126 SCALE: 3/32"=1'-0"

KEY PLAN



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KARL FISCHER
087282
STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ROOF PLAN

dob no

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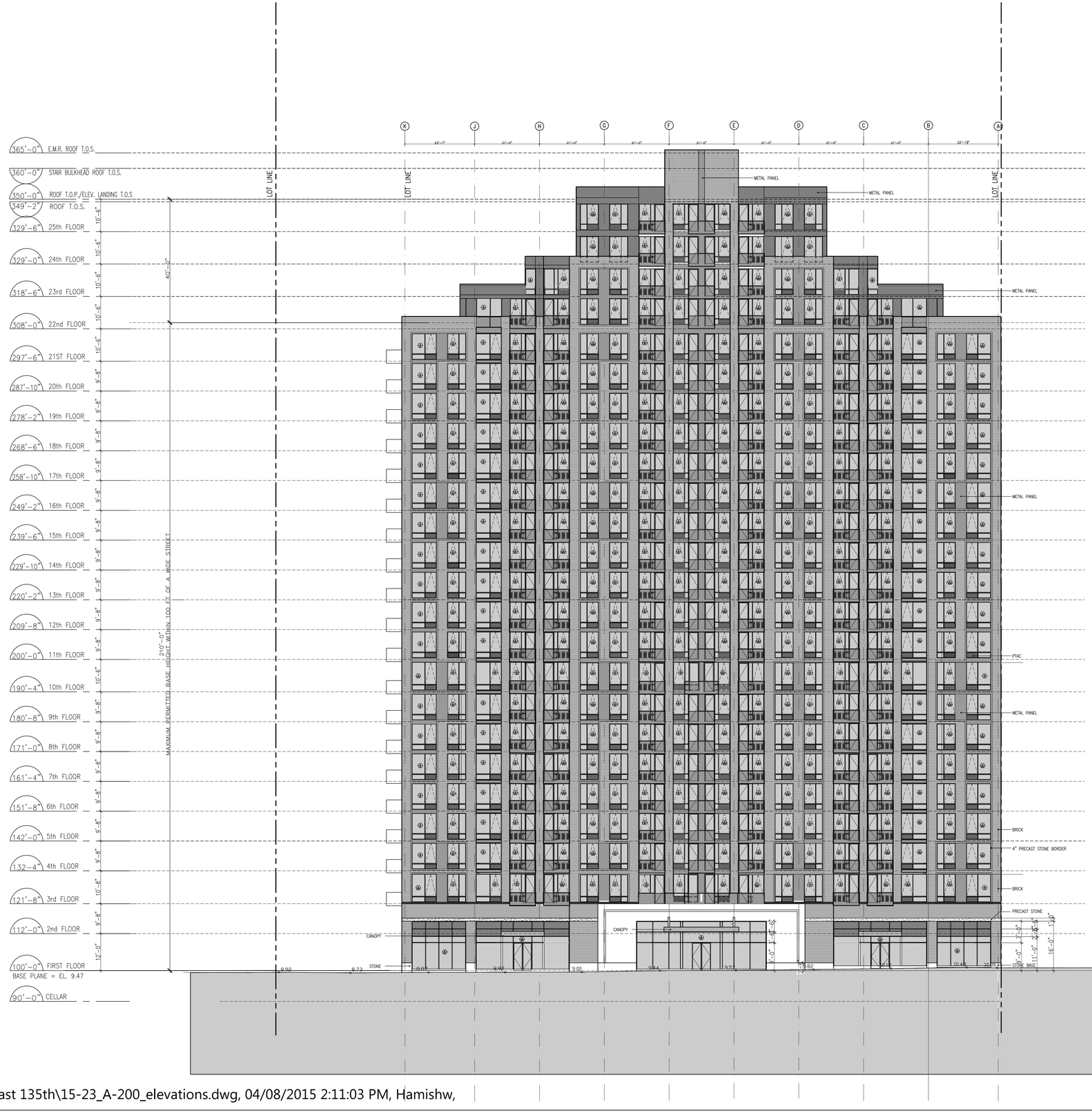

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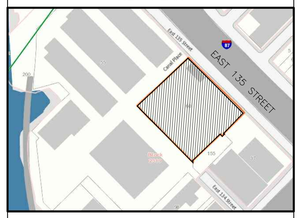

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email: info@durukandesign.com

CLIENT:
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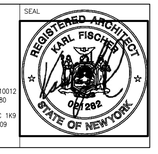
SEAL



project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
ELEVATION - 135TH STREET
OPTION 1

dob no

scale 1/16"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. A-200B
checked KF	

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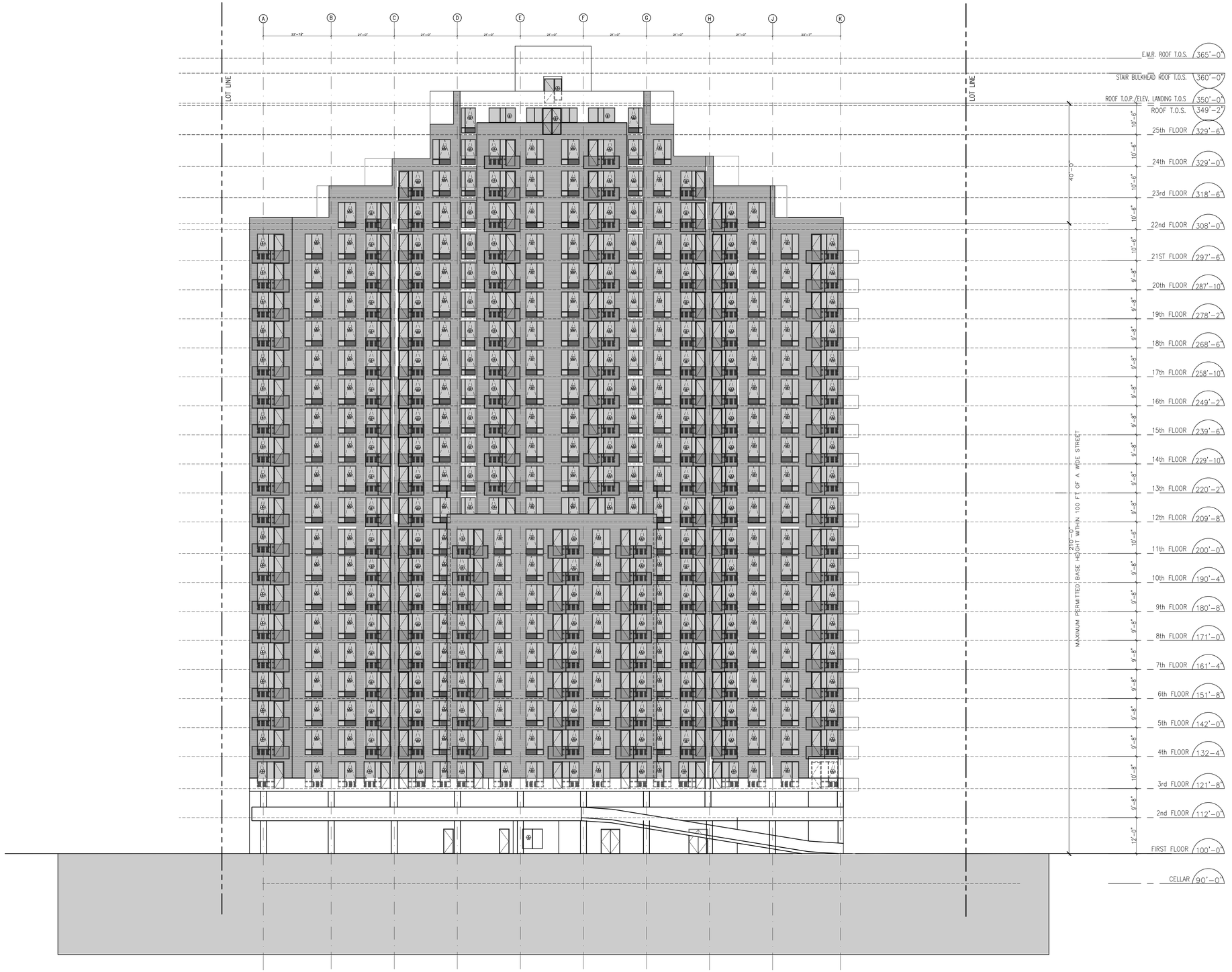

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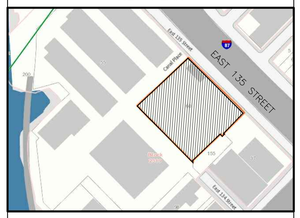

BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

ISSUES/REVISIONS

MEP ENGINEER:
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SEAL

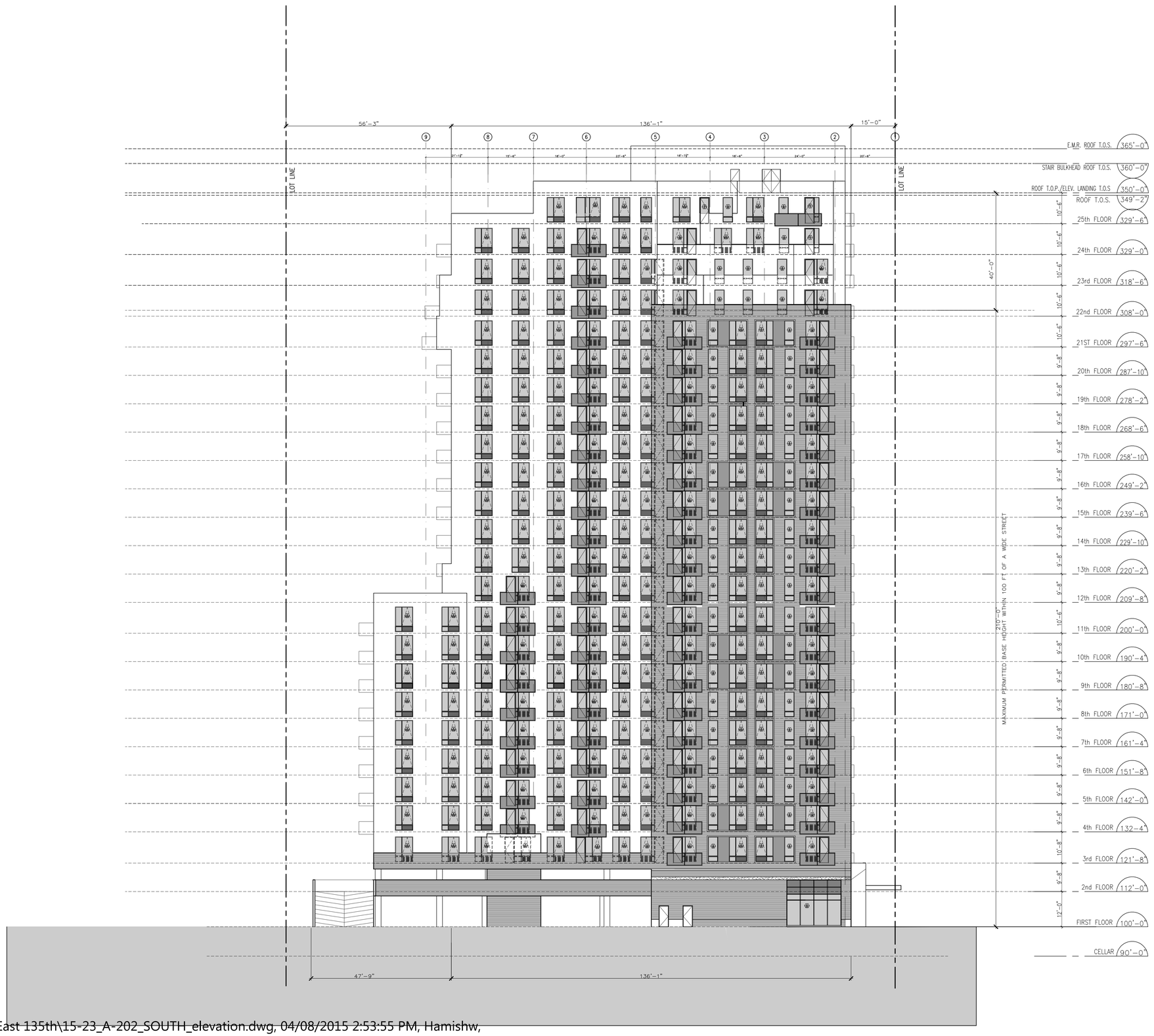
REGISTERED ARCHITECT KARL FISCHER 001282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
REAR ELEVATION

dob no

scale 1/16"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. A-201B
checked KF	



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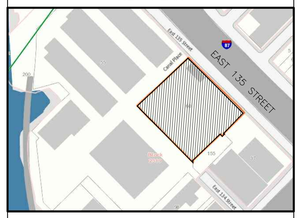

BLOCK: 2319 LOT: 60

issue	rev	date	description
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SEAL

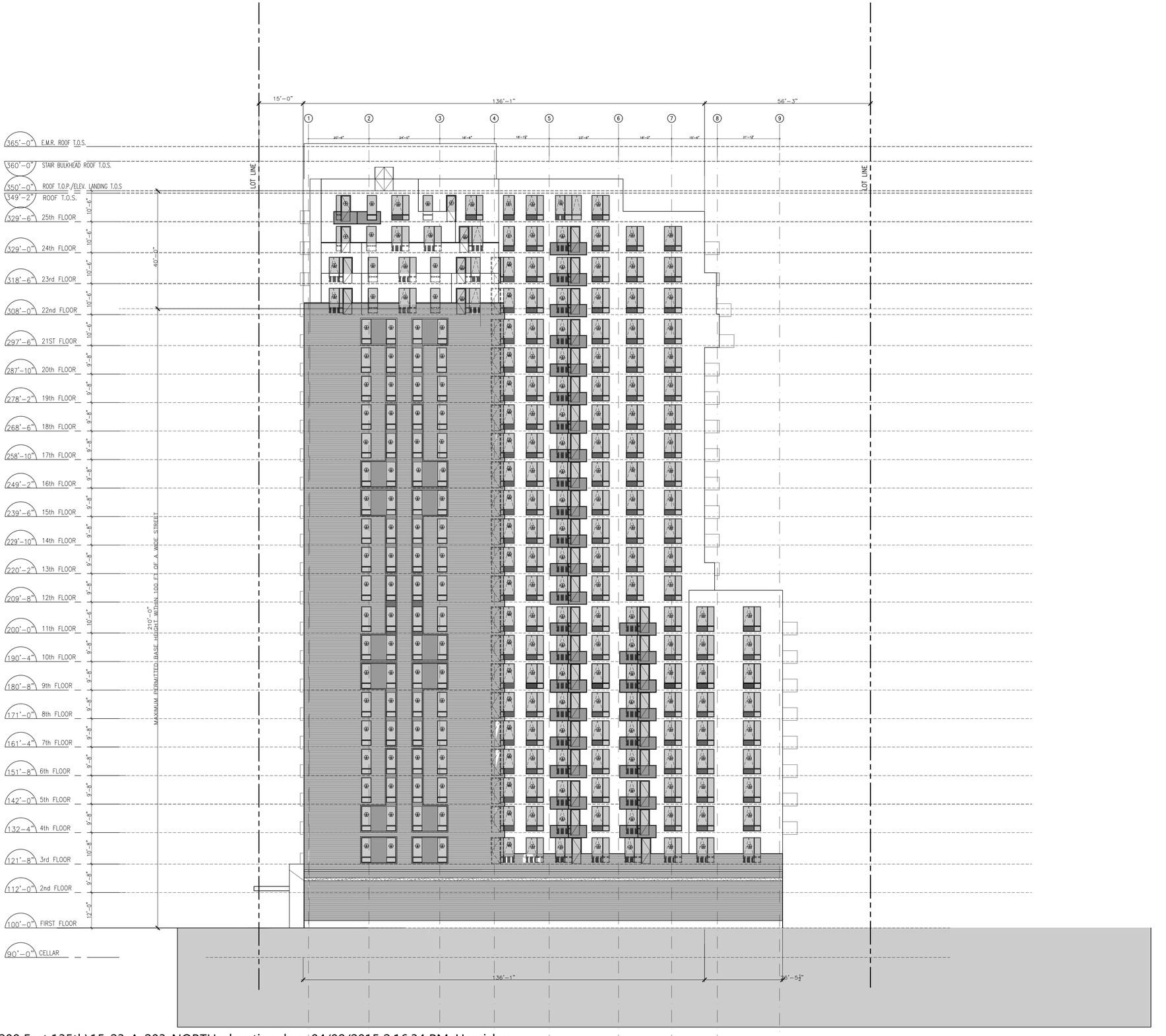
REGISTERED ARCHITECT KARL FISCHER 089282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
SOUTH ELEVATION

dob no

scale	1/16"=1'-0"	project no.	15-23
date	2014-04-02	sheet no.	OF
drawn		drawing no.	A-202B
checked	KF		



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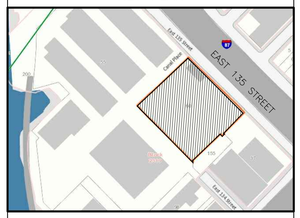

BLOCK: 2319 LOT: 60

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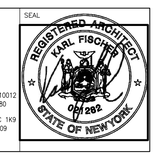
SEAL

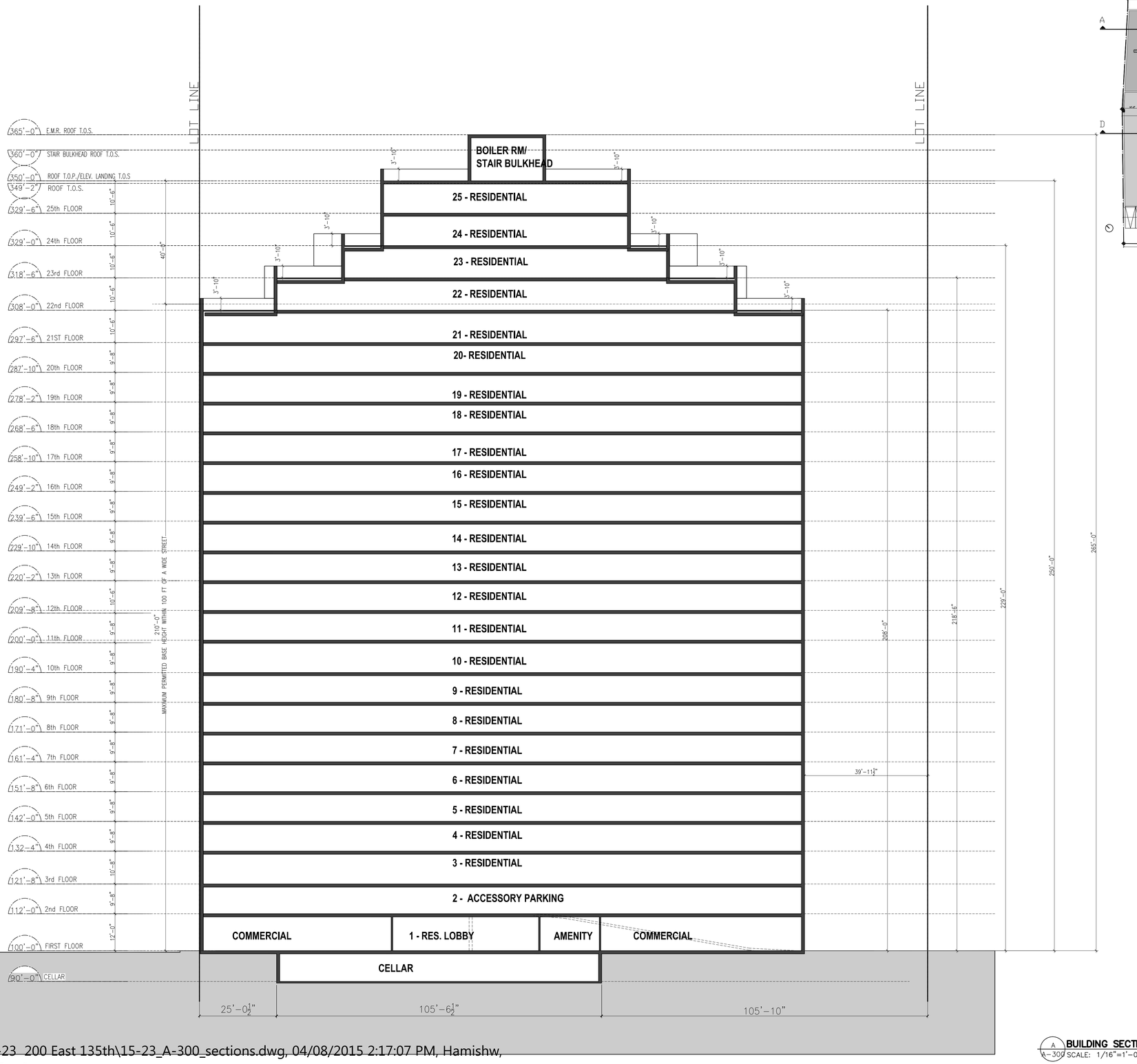


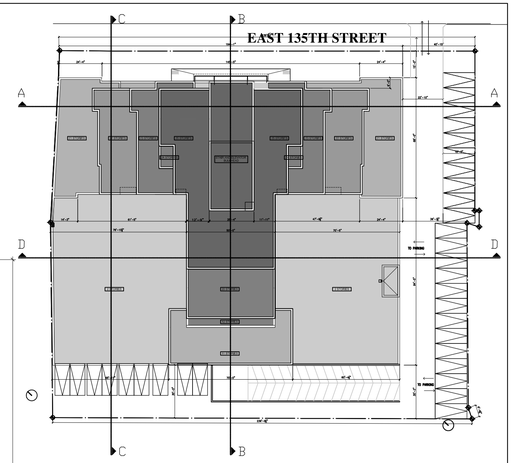
project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
NORTH ELEVATION

dob no

scale 1/16"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. A-203B
checked KF	





A BUILDING SECTION
A-300 SCALE: 1/16"=1'-0"

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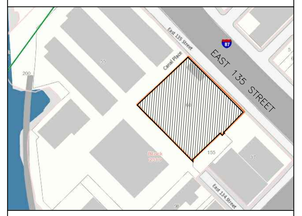

BLOCK: 2319 LOT: 60

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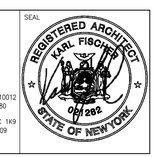
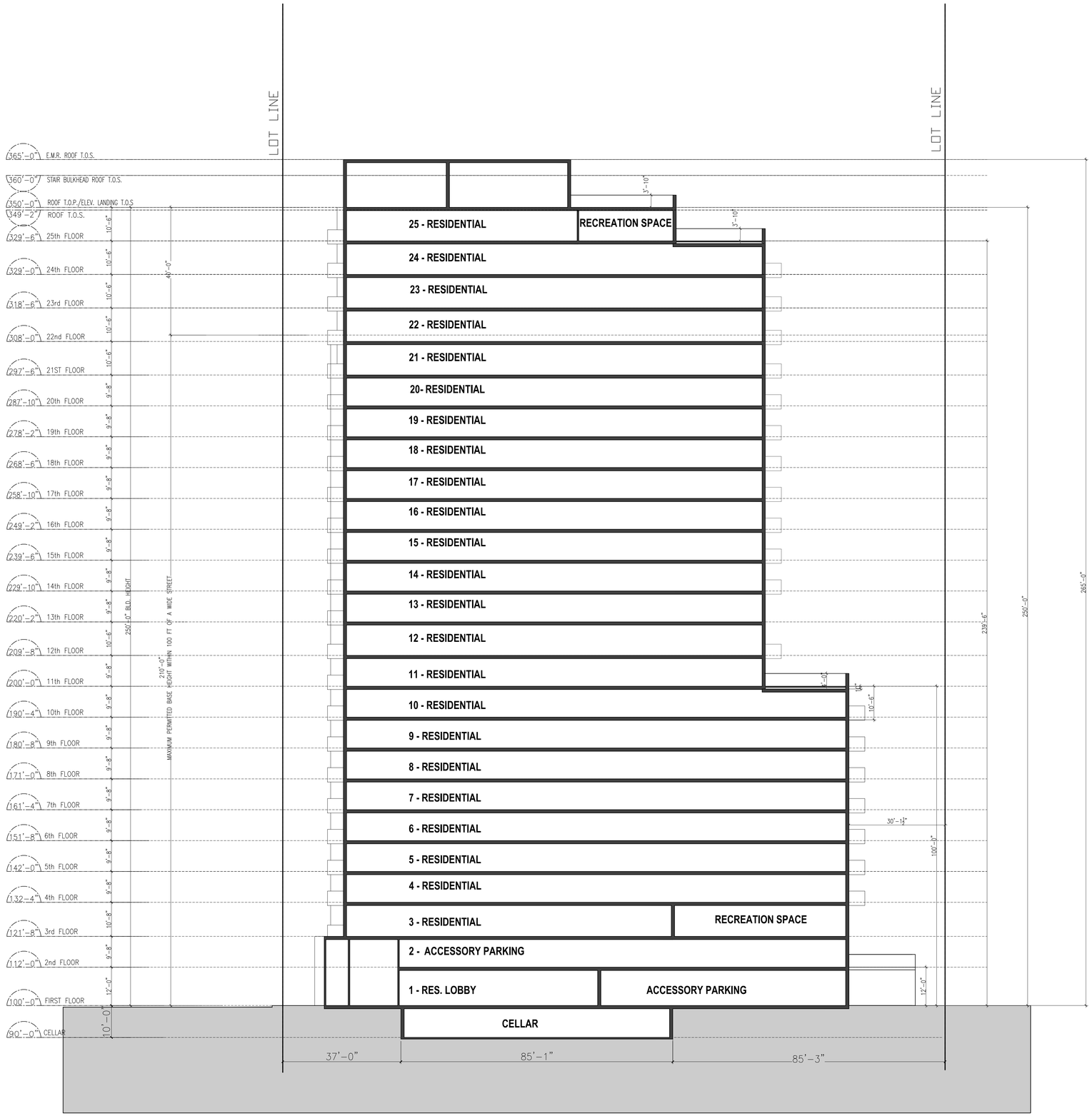


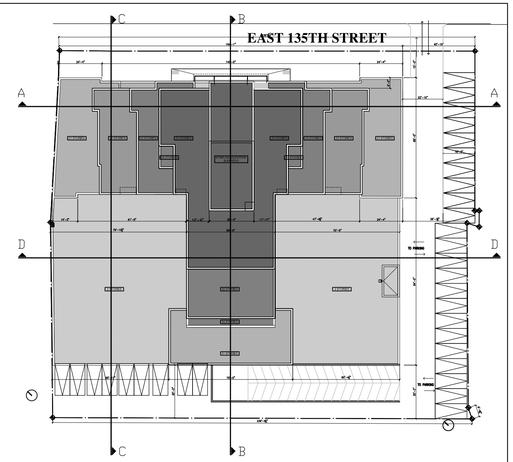
project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
BUILDING SECTION

dob no

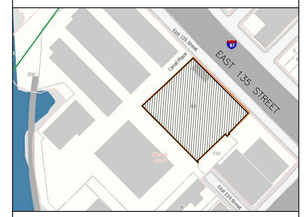
scale 1/16"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. A-300.00
checked KF	





B BUILDING SECTION
A-300 SCALE: 1/16"=1'-0"

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
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SEAL

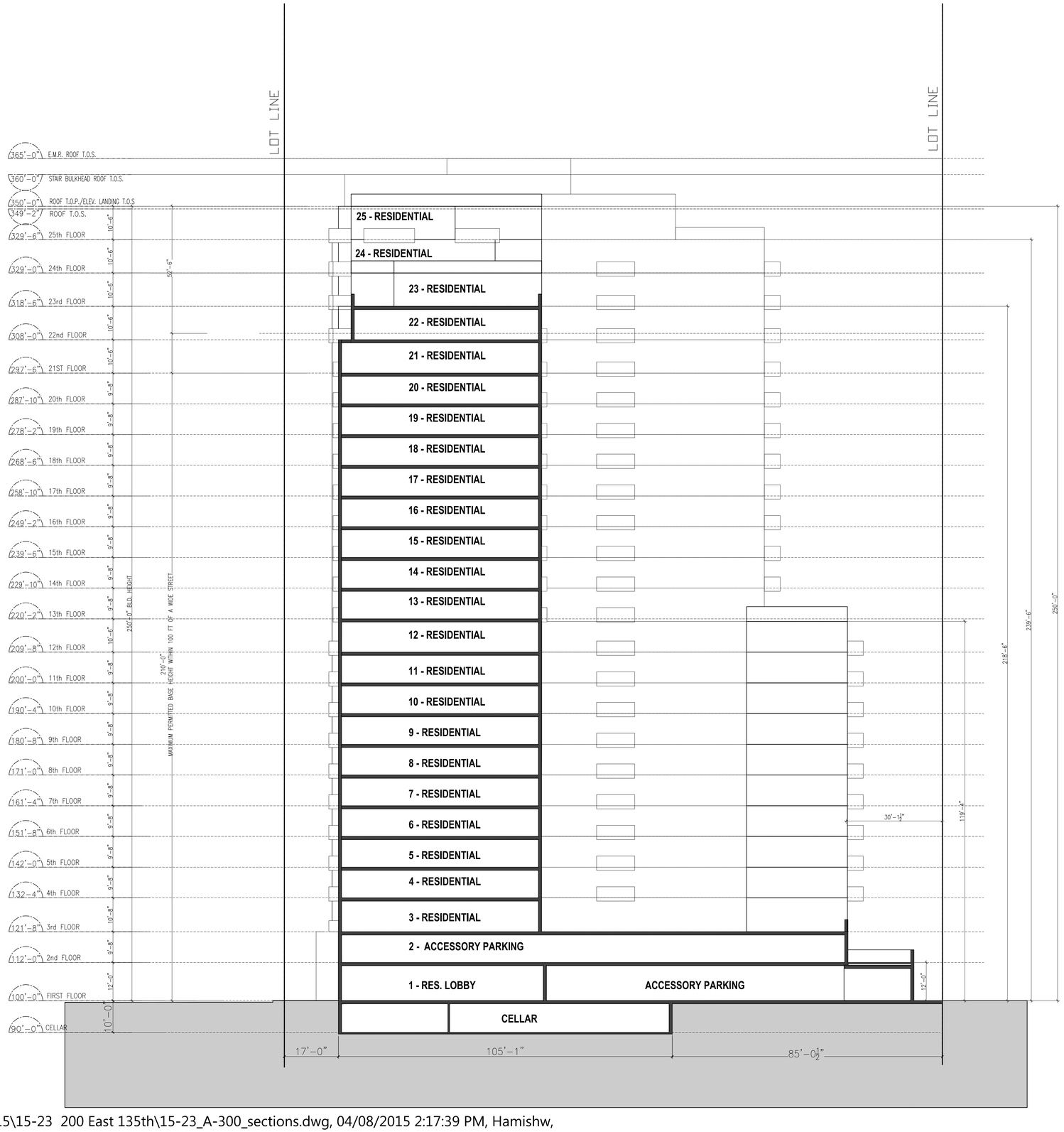
REGISTERED ARCHITECT KARL FISCHER 001282 STATE OF NEW YORK

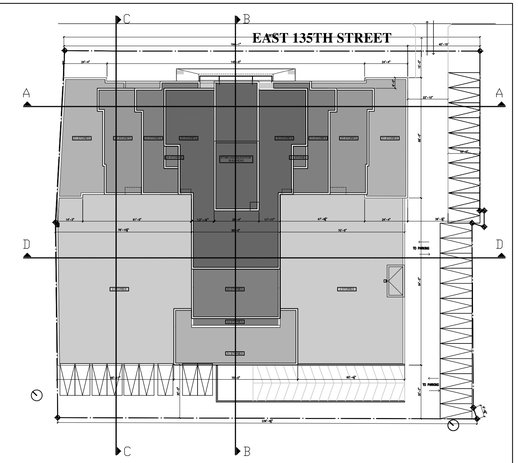
project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
BUILDING SECTION

dob no

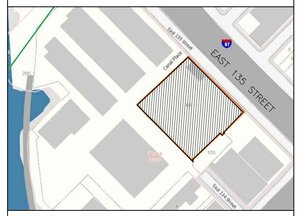
scale	1/16"=1'-0"	project no.	15-23
date	2014-04-02	sheet no.	OF
drawn		drawing no.	A-301.00
checked	KF		





C BUILDING SECTION
A-302 SCALE: 1/16"=1'-0"

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
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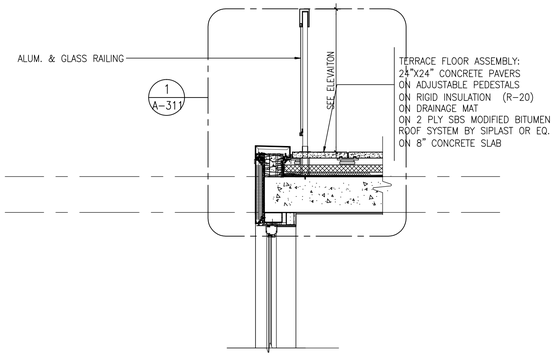
SEAL
REGISTERED ARCHITECT KARL FISCHER 001282 STATE OF NEW YORK

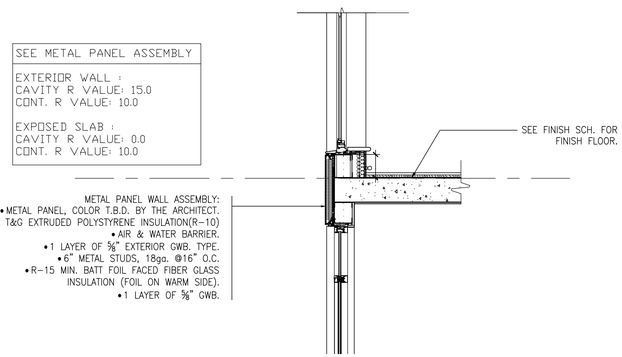
project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
BUILDING SECTION

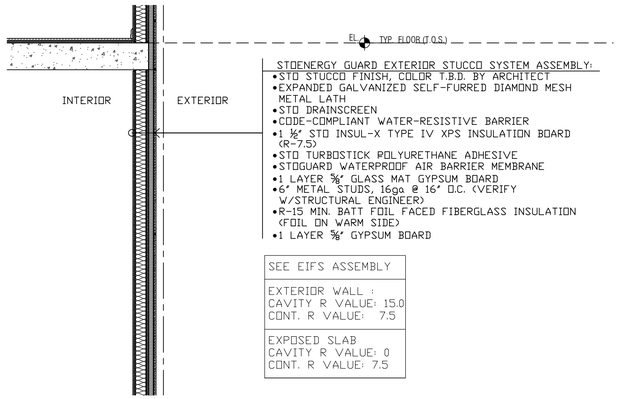
dob no

scale 1/16"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. OF
drawn	drawing no. A-302.00
checked KF	

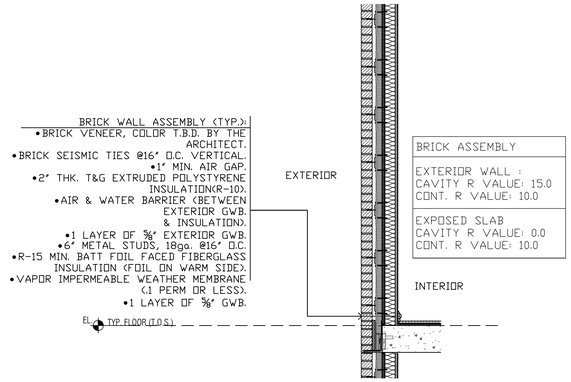




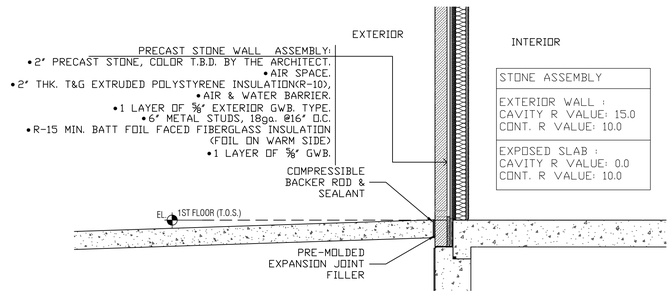
1 A-310 TYP. METAL PANEL ASSEMBLY
1/2"=1'-0"



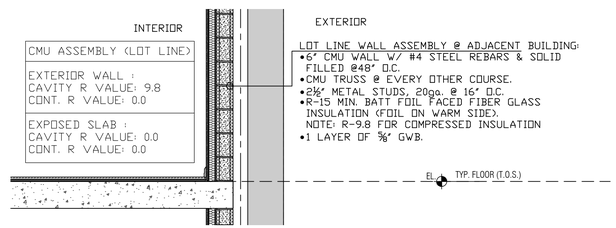
2 A-310 TYP. EIFS WALL ASSEMBLY
1/2"=1'-0"



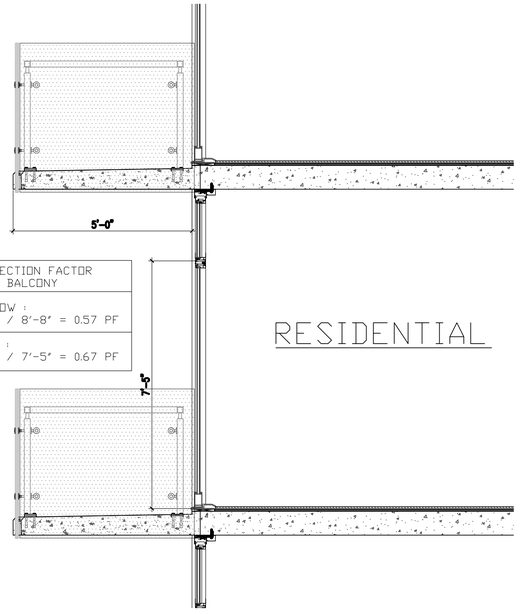
3 A-310 TYP. BRICK WALL ASSEMBLY
1/2"=1'-0"



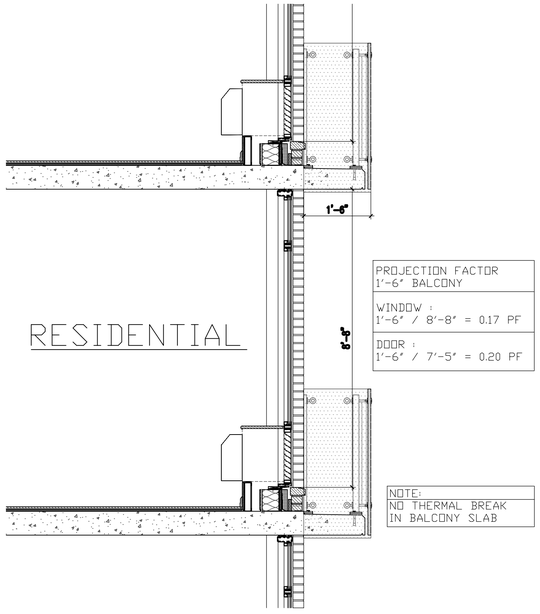
4 A-310 TYP. PRECAST STONE WALL ASSEMBLY
1/2"=1'-0"



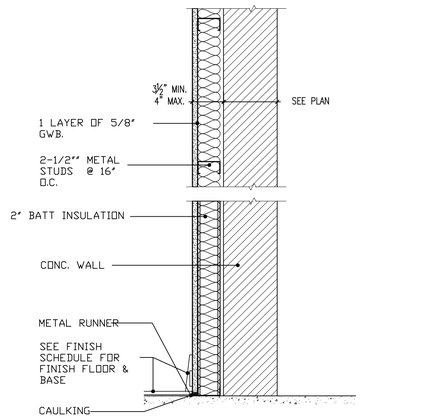
5 A-310 TYP. CMU WALL ASSEMBLY@LOT LINE
1/2"=1'-0"



6 A-310 TYP. PROJECTION FATOR
1/2"=1'-0"



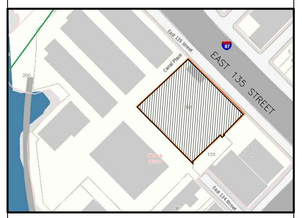
7 A-310 TYP. PROJECTION FATOR
1/2"=1'-0"



FURRING ON INTERIOR CMU OR CONCRETE WALL TO BE AS FOLLOWS: 1 LAYER OF 5/8" GWB. ON 2-1/2" METAL STUDS @ 16" O.C. W/ BATT INSULATION. R VALUE 13 COMPRESSED TO R VALUE 9.8.

8 A-310 TYP. INSULATED CELLAR WALL
1 1/2"=1'-0"

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
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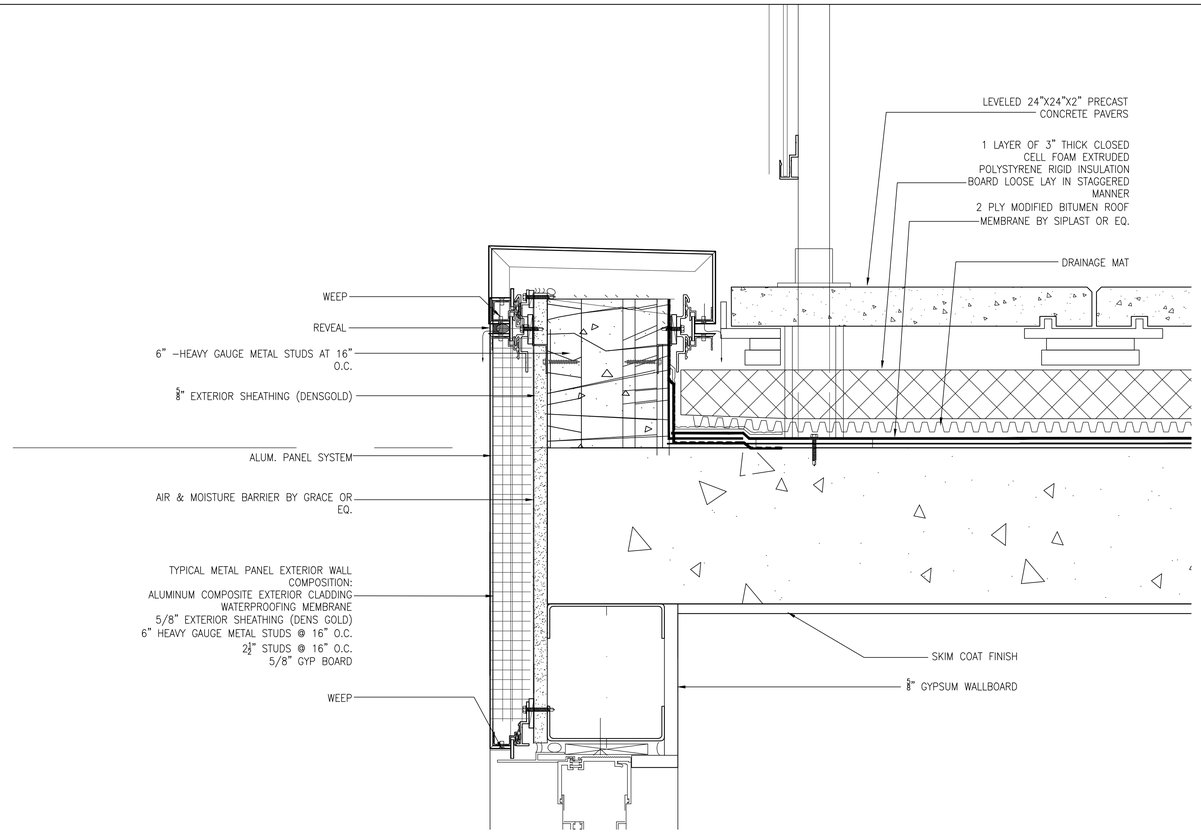
SEAL

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
SECTION DETAILS

dob no

scale: AS NOTED	project no.: 15-23
date:	sheet no.: 64 OF
drawn:	drawing no.: A-310.00
checked: KF	



1 / A-311 SECTION DETAIL AT PARAPET
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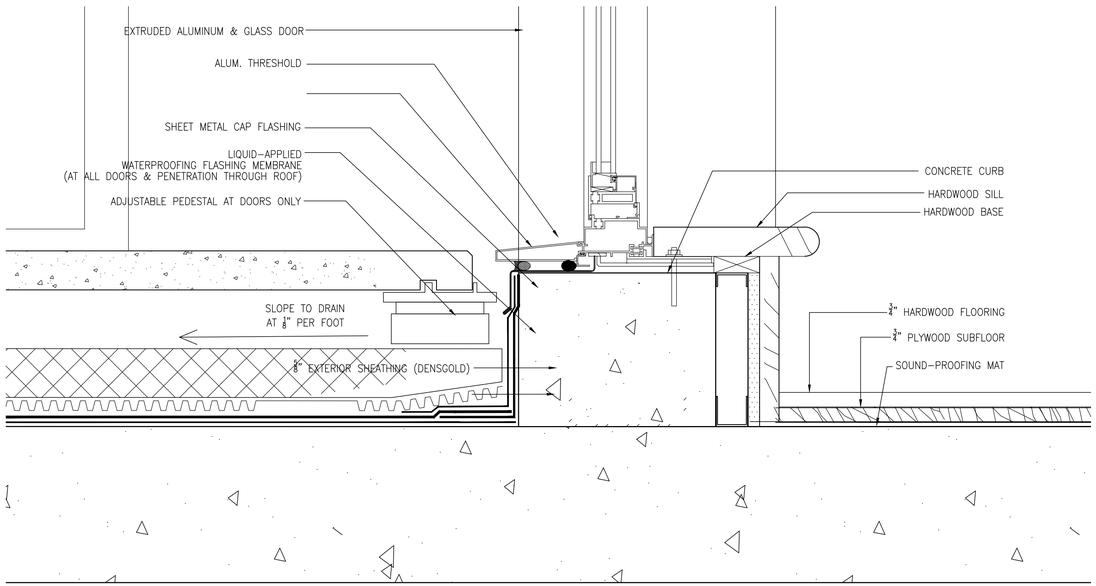

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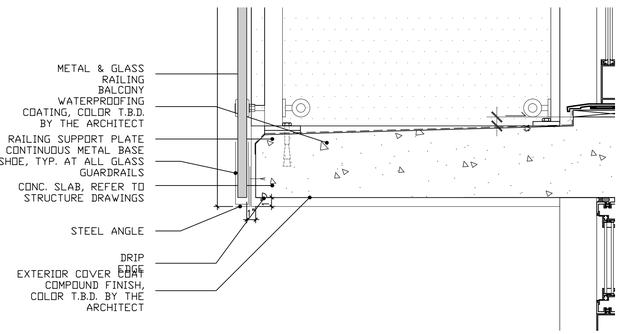

3 / A-311 TYP. BALCONY DETAIL W/ GLASS RAILINGS
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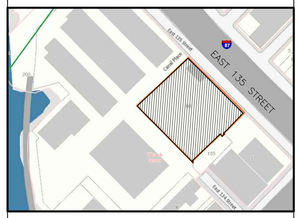
KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

ISSUES/REVISIONS

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scale: AS NOTED	project no.: 15–23
date:	sheet no.: 65 OF
drawn:	drawing no.: A-311.00
checked: KF	

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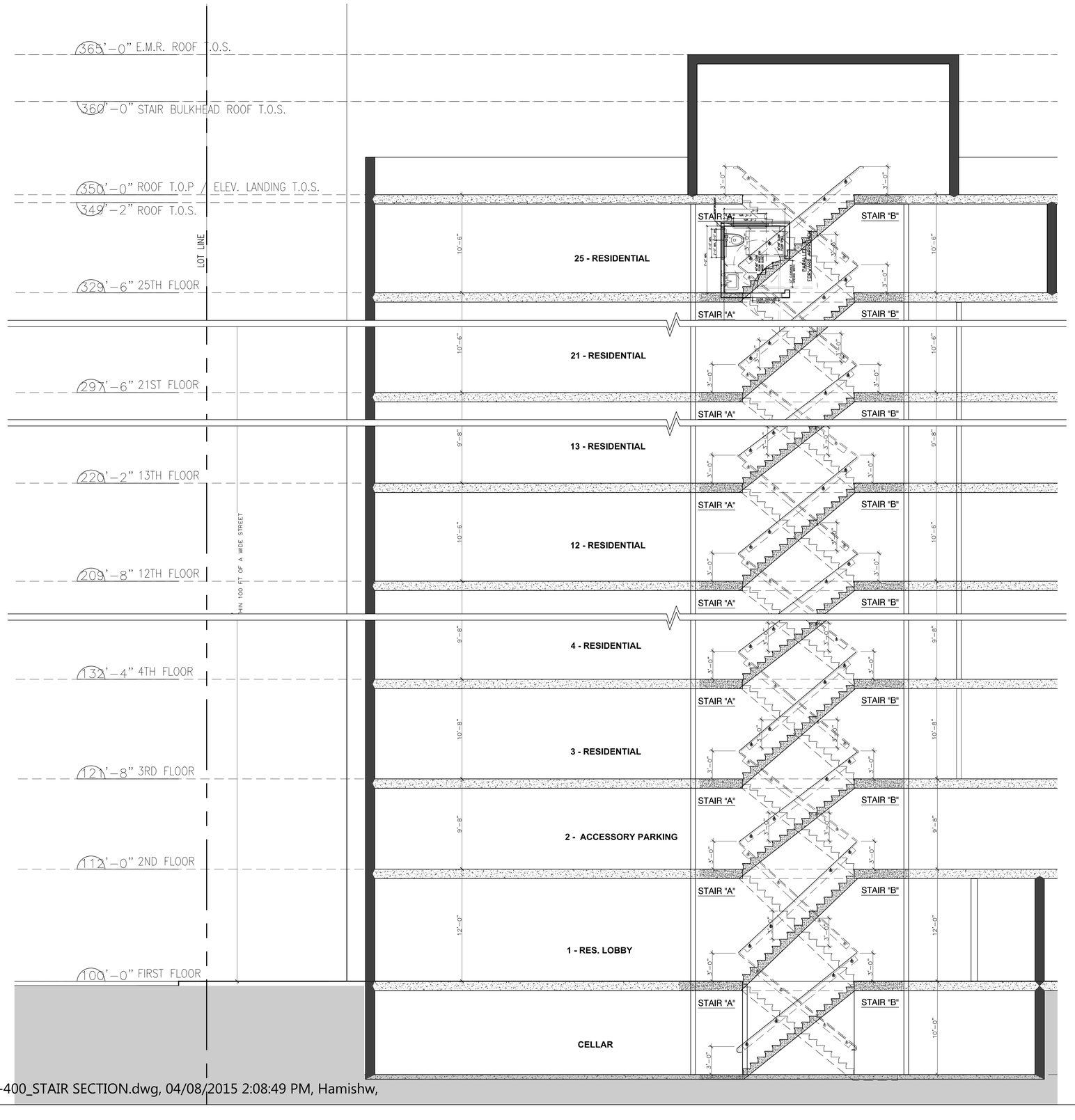

1 A400 STAIR SECTION
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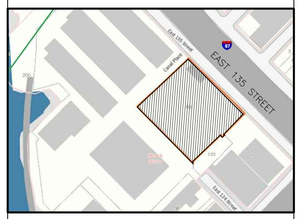

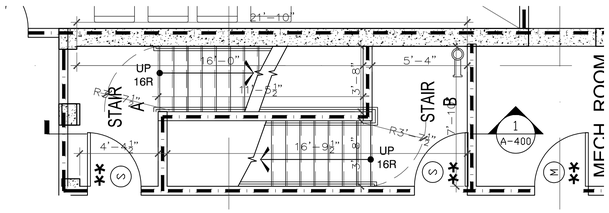

1 A-401 STAIR PLAN @ CELLAR
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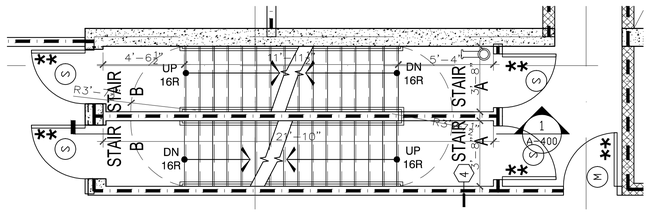

2 A-401 STAIR PLAN @ GROUND FLOOR
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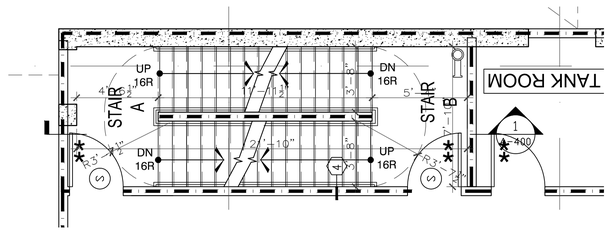

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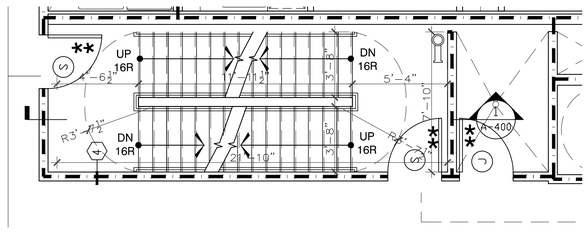

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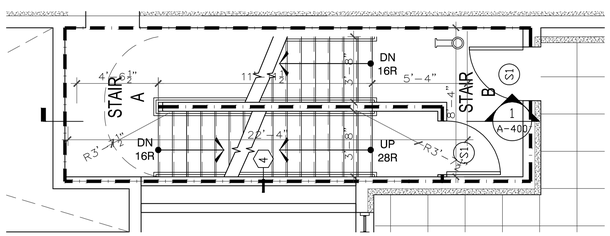
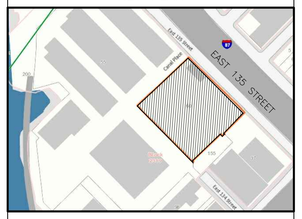


5 A-401 STAIR PLAN @ CELLAR
SCALE: 1/4"=1'-0"

KEY PLAN



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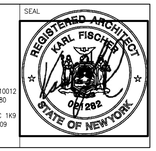

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
STAIR PLANS

dob no

scale 1/4"=1'-0"	project no. 15-23
date 2014-04-02	sheet no. 67OF
drawn	drawing no. A-401.00
checked KF	

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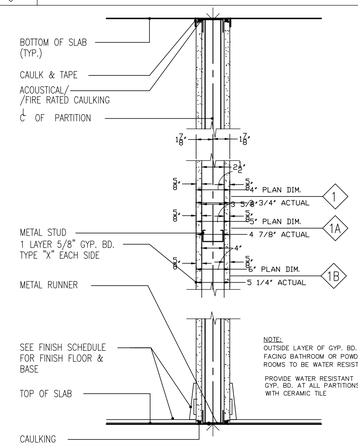
1 — 1 HR 39 STC – MEA #81-98-M — INTERIOR PARTITION

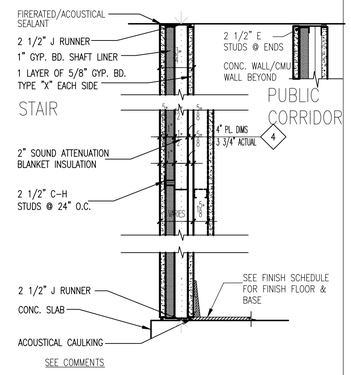


1 — PARTITONS WITHTIN APTARTMENTS TO BE AS FOLLOWS: 1 LAYER OF 5/8" GYP. BD. ON EACH SIDE OF 2 1/2" MTL STUDS @ 24" O.C. (12" O.C. @ KITCHEN CABINET LOCATIONS)

1A — PARTITONS WITHTIN APTARTMENTS TO BE AS FOLLOWS: 1 LAYER 5/8" GYP. BD. ON EACH SIDE OF 3 5/8" MTL STUDS @ 24" O.C.

1B — PARTITIONS AT ELECTRICAL PANEL TO BE AS FOLLOWS; 5/8" GYP. BD. ON EACH SIDE OF 4" MTL STUDS @ 24" O.C.

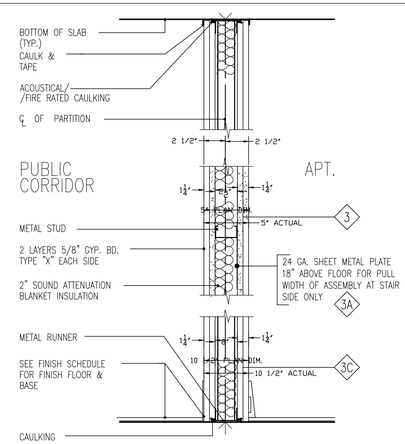
4 — 2 HR. 39 STC – BSA #542-68-SM — CAVITY SHAFTWALL BETWEEN STAIR & CORRIDOR



NOTE: SHAFT WALL BETWEEN STAIRS AND CORRIDORS TYPICAL.

4 — SHAFT WALL TO BE AS FOLLOWS: 1 LAYERS OF 5/8" GYP. BD. TYPE "X" ON EACH SIDE OF A 2 1/2" C-H METAL STUDS @ 24" O.C. WITH 1" GYP. BD. LINER PANEL AND 2" SOUND ATTENUATION BLANKET INSULATION.

3 — 2 HR 51 STC – MEA #81-98-M — PARTITION BETWEEN PUBLIC HALL AND APARTMENTS & APARTMENT AND APARTMENT



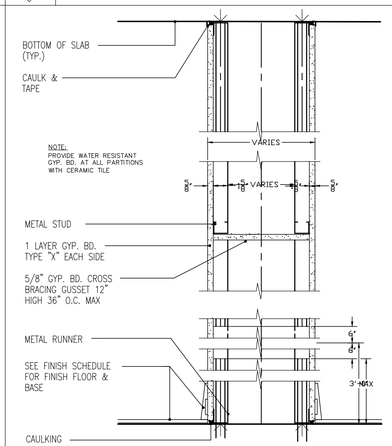
3 — PARTITIONS BETWEEN PUBLIC HALL & APARTMENTS TO BE AS FOLLOWS: 2 LAYER OF 5/8" GYP. BD. TYPE "X" ON EACH SIDE OF 2 1/2" METAL STUDS @ 24" O.C. WITH 2" SOUND ATTENUATION BLANKET INSULATION BETWEEN STUDS.

3A — PARTITIONS BETWEEN APARTMENTS AND STAIRS, BETWEEN STAIRS AND PUBLIC HALLS TO BE AS FOLLOWS: 2 LAYER OF 5/8" GYP. BD. TYPE "X" ON EACH SIDE OF 2 1/2" METAL STUDS @ 24" O.C.

3B — PARTITION 3B SAME AS 3A WITH 3 5/8" METAL STUDS @ 24" O.C.

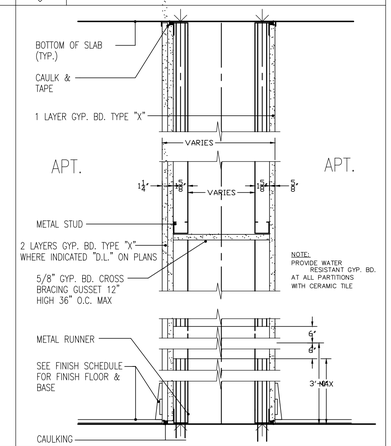
3C — PARTITIONS BETWEEN PUBLIC HALL & APARTMENTS TO BE AS FOLLOWS: 2 LAYERS OF 5/8" GYP. BD. TYPE "X" ON EACH SIDE OF 8" STEEL STUDS @ 24" O.C. WITH 2" SOUND ATTENUATION BLANKET INSULATION BETWEEN STUDS.

7 — 1 HR. 50 STC – BSA# 173-77-SM — PIPE CHASE WITHIN APARTMENT



7 — PIPE CHASE WITHIN APARTMENT TO BE AS FOLLOWS: 1 LAYER OF 5/8" WR GYP. BD. ON 1 5/8" METAL STUDS @ 24" O.C. 1 LAYER OF 5/8" WR GYP. BD. ON 1 5/8" METAL STUDS @ 24" O.C. OPPOSITE SIDE.

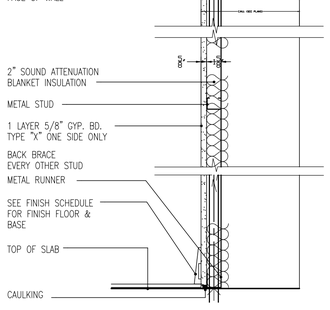
8 — 2 HR. 50 STC – BSA #173-77-SM — PIPE CHASE BETWEEN APARTMENTS



8 — PIPE CHASE BETWEEN APARTMENTS TO BE AS FOLLOWS: 1 LAYER OF 5/8" WR GYP. BD. TYPE "X" ON 1 5/8" METAL STUDS @ 24" O.C. 2 LAYERS OF 5/8" WR GYP. BD. TYPE "X" ON 1 5/8" METAL STUDS @ 24" O.C. OPPOSITE SIDE.

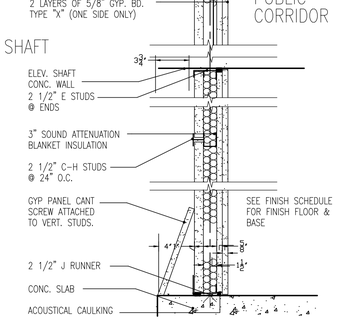
8A — PIPE CHASE BETWEEN APARTMENTS AND PUBLIC CORRIDOR TO BE AS FOLLOWS: TWO LAYERS OF 5/8" WR GYP. BD. TYPE "X" ON 1 5/8" METAL STUDS @ 24" O.C. 2 LAYERS OF 5/8" WR GYP. BD. TYPE "X" ON 1 5/8" METAL STUDS @ 24" O.C. OPPOSITE SIDE.

18 — – — PIPE CHASE @ CORRIDOR OR @ C.M.U. OR CONC. WALL



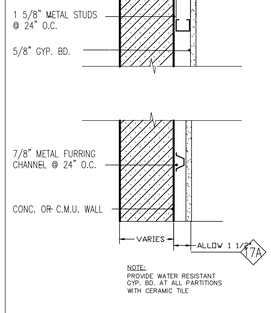
18 — 5/8" GYP. BD OVER 1 5/8" METAL STUDS @ 24" O.C. W/ 2" SOUND ATTENUATION BLANKET INSULATION.

6 — 2 HR. 50STC –BSA#542-68-SM — CAVITY SHAFTWALL @ ELEVATORS SHAFTS



6 — ELEVATOR SHAFT WALL TO BE AS FOLLOWS: 2 LAYERS OF 5/8" GYP. BD. TYPE "X" ON CORRIDOR SIDE & 1" GYP. BD. LINER PANEL ON SHAFT SIDE OF 2 1/2" C-H METAL STUDS @ 24" O.C. MAX. W/ 2" SOUND ATTENUATION BLANKET INSULATION. OMIT SOUND INSULATION @ DUCT SHAFTS & ELEC, RISER SHAFTS

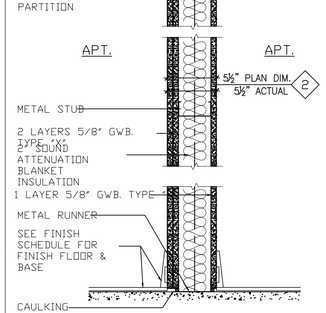
17 — 3 HR. – MEA #1-74-M — FURRING ON INTERIOR CONCRETE OR C.M.U. WALL



17 — 5/8" GYP. BD OVER 1 5/8" METAL STUDS @ 24" O.C.

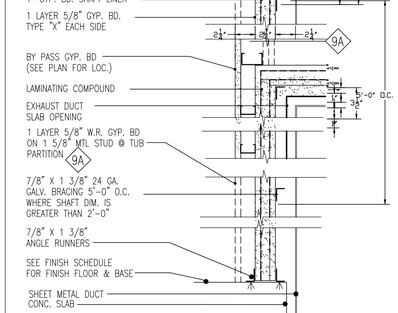
17A — 5/8" GYP. BD OVER 7/8" FURRING METAL STUDS @ 24" O.C.

2 — BETWEEN APARTMENTS — 1 HR, 50 STC – MEA # 81-98-M



2 — PARTITIONS BETWEEN APARTMENTS TO BE AS FOLLOWS: 2 LAYERS OF 5/8" GWB. TYPE 'X' ON ONE SIDE W/ ONE LAYER GWB. TYPE 'X' ON OTHER SIDE OF 3-5/8" METAL STUDS @ 16" O.C. WITH 2" SOUND ATTENUATION BLANKET INSULATION BETWEEN STUDS. (12" O.C. @ KITCHEN CABINET LOCATIONS)

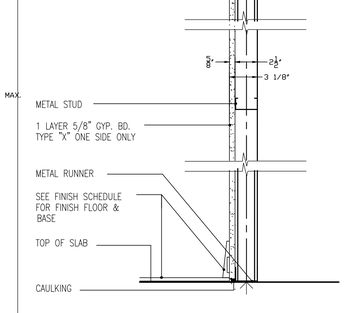
9 — 2 HR.– BSA #898-47-SM — SOLID SHAFTWALL W/ METAL DUCT



9 — 1" GYP. BD. LINER PANEL LAMINATED TO 1 LAYER 5/8" GYP. BD. TYPE "X" EACH SIDE.

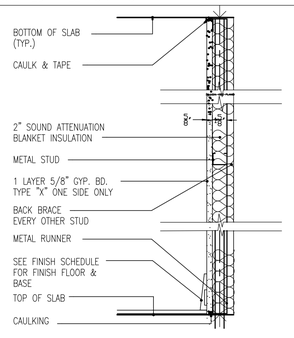
9A — SAME AS PARTITION #10 WITH 1 LAYER OF 5/8" W.R. GYP. BD. ON 1 5/8" MTL STUD OVER PARTITION

10 — – — FREE STANDING WALL FURRING



10 — 5/8" GYP. BD OVER 2 1/2" METAL STUDS @ 24" O.C.

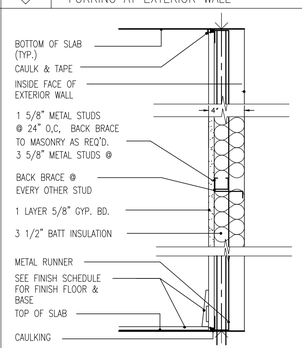
11 — – — INSULATED WALL FURRING



11 — 5/8" GYP. BD OVER 1 5/8" METAL STUDS @ 24" O.C. W/ 2" SOUND ATTENUATION BLANKET INSULATION.

11A — 5/8" GYP. BD OVER 1 5/8" METAL STUDS @ 24" O.C. W/ 2" SOUND ATTENUATION BLANKET INSULATION WITH WATER RESISTANT GYP. BD. ONE SIDE.

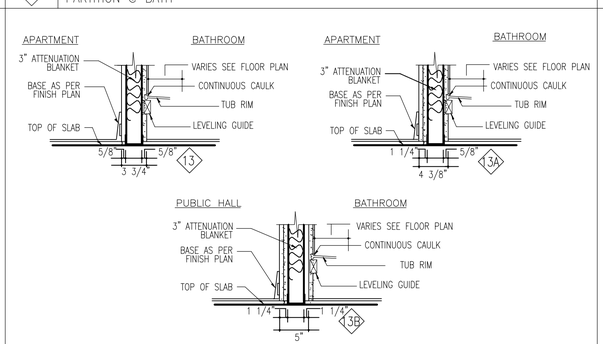
5 — – — FURRING AT EXTERIOR WALL



5 — 5/8" GYP. BD OVER 1 5/8" METAL STUDS @ 24" O.C. W/ 3 1/2" BATT INSULATION.

5A — 5/8" GYP. BD OVER 2 1/2" METAL STUDS @ 24" O.C. W/ 3 1/2" BATT INSULATION.

13 — 1 HR 52 STC – MEA# 81-98-M — PARTITION @ BATH

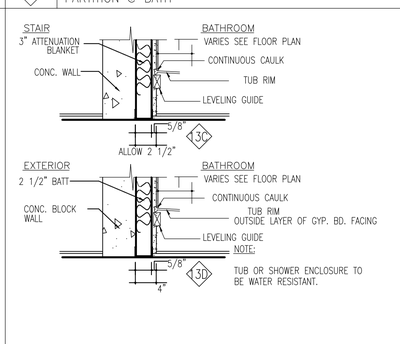


13 — PARTITIONS WITHIN APARTMENT BETWEEN APT. & BATHROOM TO BE AS FOLLOWS: 1 LAYER OF 5/8" GYP. BD. TYPE "X" ON EACH SIDE OF 2 1/2" METAL STUDS @ 24" O.C. WITH 2" SOUND ATTENUATION BLANKET INSULATION BETWEEN STUDS.

13A — PARTITIONS BETWEEN APARTMENTS AT BATHROOM TO BE AS FOLLOWS: 2 LAYERS OF 5/8" GYP. BD. TYPE "X" ON ONE W/ONE LAYER GYP. BD. TYPE "X" ON OTHER SIDE OF 2 1/2" MTL STUDS @ 24" O.C. WITH 2" SOUND ATTENUATION BLANKET INSULATION BETWEEN STUDS.

13B — PARTITIONS BETWEEN APARTMENT BATHROOM & PUBLIC HALL TO BE AS FOLLOWS: 2 LAYERS OF 5/8" GYP. BD. TYPE "X" ON EACH SIDE OF 2 1/2" METAL STUDS @ 24" O.C. WITH 2" SOUND ATTENUATION BLANKET INSULATION BETWEEN STUDS.

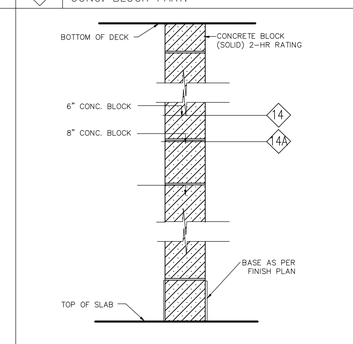
13 — 1 HR 52 STC – MEA# 81-98-M — PARTITION @ BATH



13C — PARTITIONS AT CMU TO BE AS FOLLOWS: 2 LAYERS OF 5/8" GYP. BD. TYPE "X" ON EACH SIDE OF 1 5/8" METAL STUDS @ 24" O.C. WITH 2" SOUND ATTENUATION BLANKET INSULATION BETWEEN STUDS.

13D — PARTITIONS AT EXTERIOR TO BE AS FOLLOWS: 2 LAYERS OF 5/8" GYP. BD. TYPE "X" ON EACH SIDE OF 3 5/8" METAL STUDS @ 24" O.C. WITH 3 1/2" BATT INSULATION BETWEEN STUDS.

14 — 2 HR 39 STC –#MEA 638-41-SM — CONC. BLOCK PART.

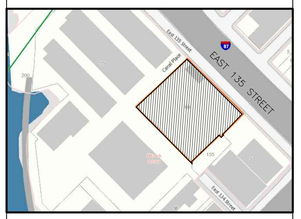


14 — 6" CONC. BLOCK PART.

14A — 8" CONC. BLOCK PART.

14B — 8" CONC. BLOCK, 100%FILLED SOLID (3-HR RATING)

KEY PLAN



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SEAL

REGISTERED ARCHITECT KARL FISCHER 001282 STATE OF NEW YORK

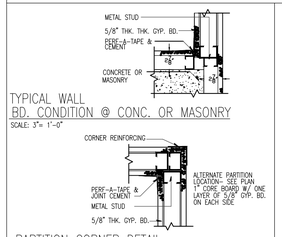
project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
PARTITION TYPES

dob no

scale: AS INDICATED	project no.: 15-23
date: 2015-07-09	sheet no.: 84 OF
drawn: VV	drawing no.: A-500.00
checked: KF	

MISCELLANEOUS DETAILS

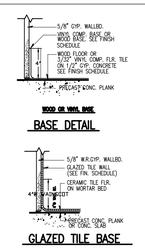


TYPICAL WALL BD. CONDITION @ CONC. OR MASONRY

SCALE: 3"= 1'-0"

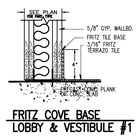
PARTITION CORNER DETAIL

SCALE: 3"= 1'-0"

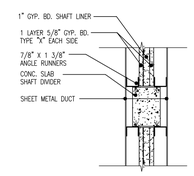


BASE DETAIL

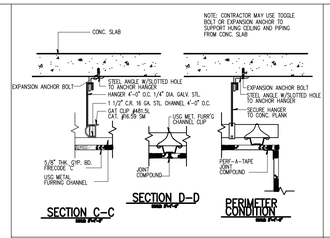
GLAZED TILE BASE



FRITZ COVE BASE LOBBY & VESTIBULE #1



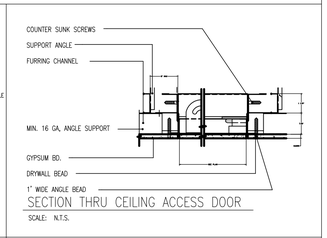
DETAIL @ BACK TO BACK SHEET MET.



SECTION C-C

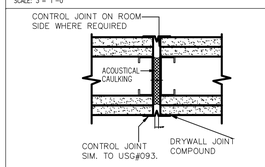
SECTION D-D

PERIMETER CONDITION

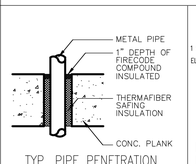


SECTION THRU CEILING ACCESS DOOR

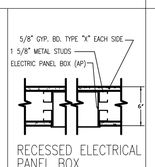
SCALE: N.T.S.



INTERIOR CONTROL JOINT DETAIL

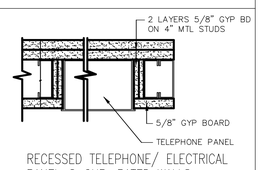


TYP. PIPE PENETRATION FIRE ASSEMBLY DETAIL

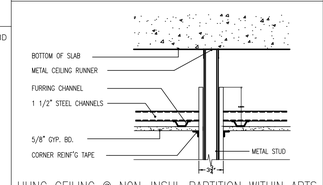


RECESSED ELECTRICAL PANEL BOX

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

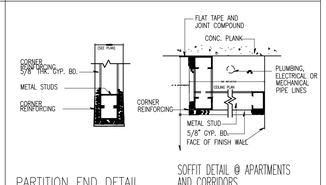


RECESSED TELEPHONE/ ELECTRICAL PANEL @ 2HR. RATED WALLS



HUNG CEILING @ NON-INSUL PARTITION WITHIN APTS

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

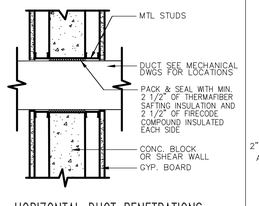


PARTITION END DETAIL

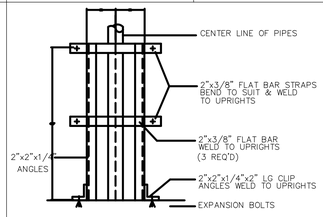
SCALE: 3"= 1'-0"

SOFFIT DETAIL @ APARTMENTS AND CORRIDORS

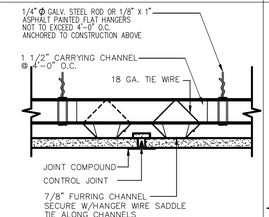
SCALE: 3"=1'-0"



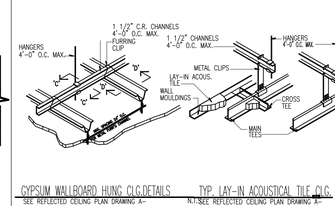
HORIZONTAL DUCT PENETRATIONS



PIPE GUARD AT WALLS AND COLUMNS



TYP. DRYWALL HUNG. CLG. DETAIL

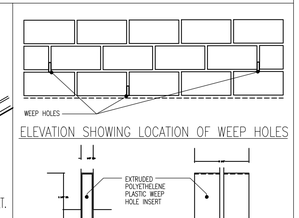


GYPSUM WALLBOARD HUNG CLG.DETAILS

SEE REFLECTED CEILING PLAN DRAWING A-

TYP. LAY-IN ACOUSTICAL TILE CLG. DET.

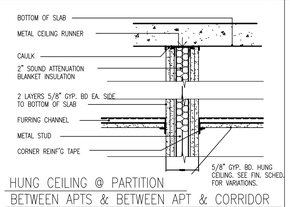
N.T.SEE REFLECTED CEILING PLAN DRAWING A-



ELEVATION SHOWING LOCATION OF WEEP HOLES

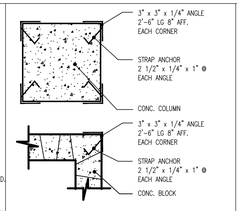
FRONT ELEVATION

SIDE ELEVATION

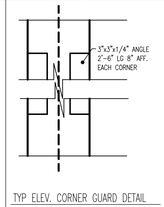


HUNG CEILING @ PARTITION BETWEEN APTS & BETWEEN APT & CORRIDOR

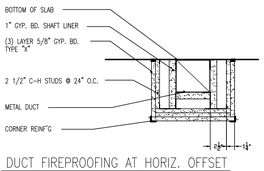
SCALE: 1 1/2" = 1'-0"



TYP CORNER GUARD DETAIL COL AND CONC. BLOCK

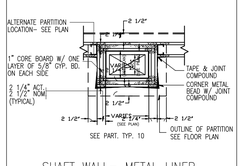


TYP ELEV. CORNER GUARD DETAIL COL AND CONC. BLOCK (GARAGE)



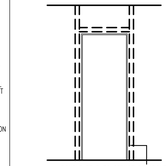
DUCT FIREPROOFING AT HORIZ. OFFSET (ALT. DETAIL)

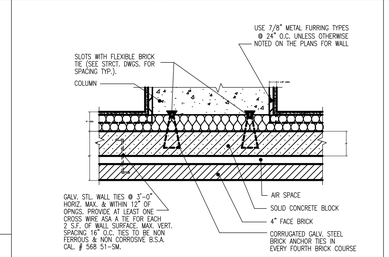
SCALE: 1 1/2" = 1'-0"



SHAFT WALL- METAL LINER

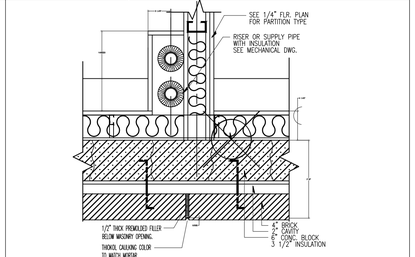
SCALE: 1 1/2"= 1'-0"





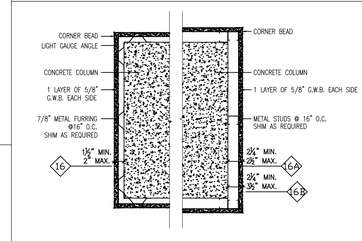
TYPICAL ANCHOR DETAIL

SCALE: N.T.S.



TYPICAL HEATING RISER OR SUPPLY CHASE (BETWEEN APTS.) EXTERIOR CONTROL JOINT DETAIL

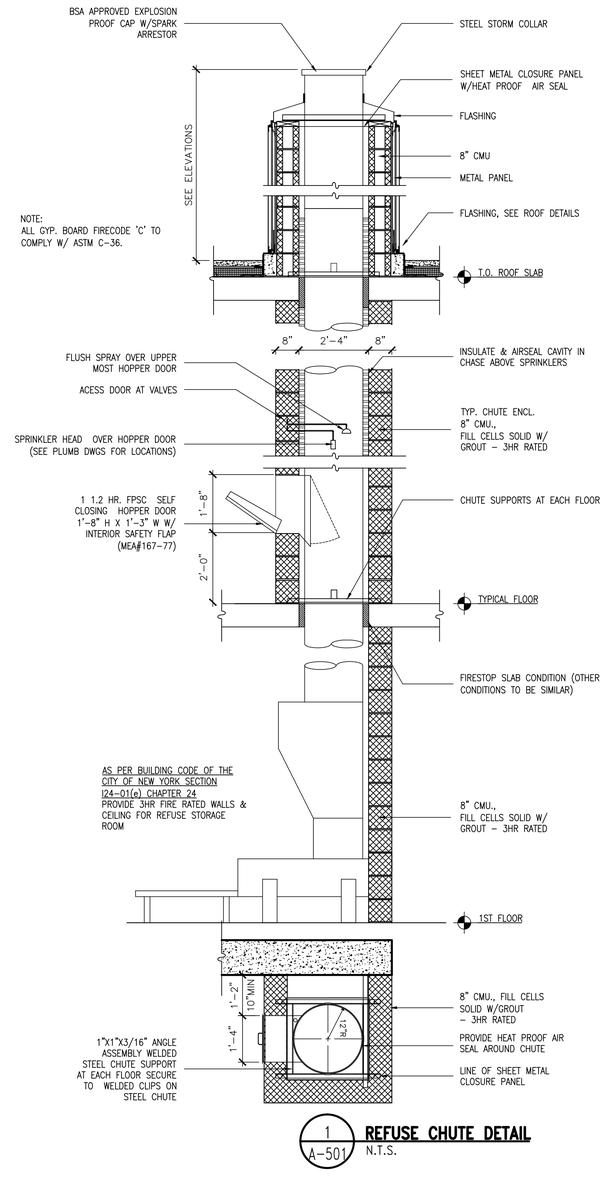
SCALE: 3" = 1'-0"



CONCRETE COLUMN - 2 HR, 50 STC - BSA #542-68-SM

SCALE: N.T.S.

SECTION: REFUSE CHUTE DETAIL

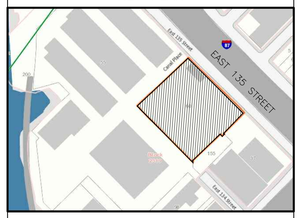


1 A-501 **REFUSE CHUTE DETAIL**

N.T.S.

NOTE: COMPACTOR ROOM & REFUSE CHUTE ENCLOSURE:
1. PROVIDE 3HR FIRE RATED WALLS & CEILING FOR REFUSE CHUTE & COMPACTOR ROOM
2. CMU "CONC BLOCK: NOMINAL SIZE 8"x8"x16" TO BE LAID IN FULL BED OF ⅜" MORTAR VERTICAL JOINTS STAGGERED.
3. REFUSE CHUTE & COMPACTOR ROOM ENCLOSURE TO HAVE MIN. OF 50 STC RATING.

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

ISSUES/REVISIONS

MEP ENGINEER:
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SEAL

REGISTERED ARCHITECT KARL FISCHER 026282 STATE OF NEW YORK

project title

RESIDENTIAL DEVELOPMENT

200 EAST 135TH ST. BRONX, NEW YORK

drawing title

MISCELLANEOUS DETAILS

dob no

scale: AS INDICATED	project no.: 15-23
date: 2015-07-09	sheet no.: 85OF
drawn: VV	drawing no.: A-501.00
checked: KF	

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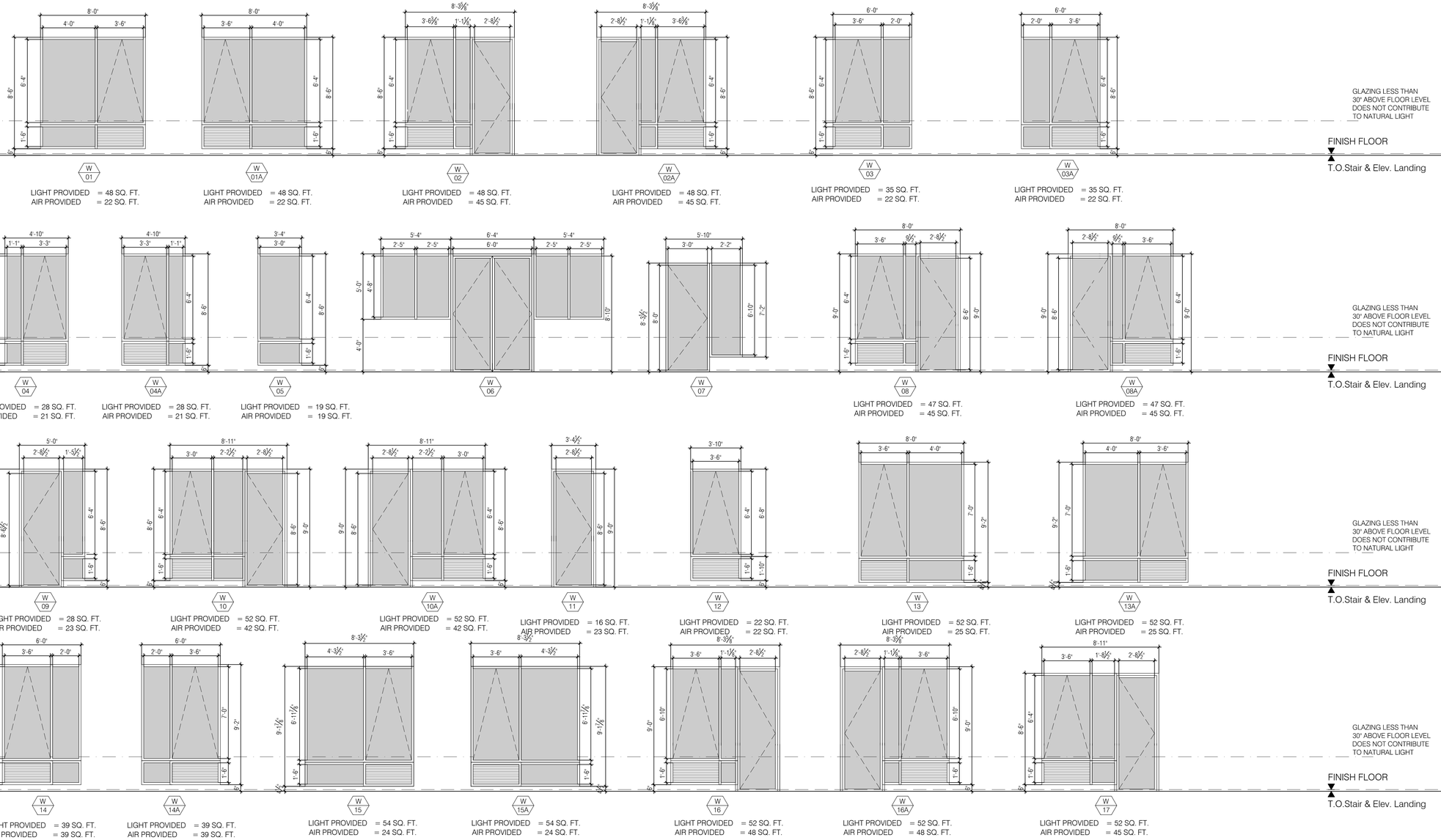


WINDOW & EXTERIOR DOOR NOTES:

1. ALL WINDOW AND DOOR GLASS TO BE CLEAR NON-TINTED.
2. GC TO COORDINATE WINDOW & DOOR SWINGS WITH FLOOR PLANS.
3. ALL WINDOWS TO BE CONSTRUCTED OF ALUMINUM FRAME WITH THERMAL BREAK, DOUBLE PANE WITH LOW-E, CLEAR, SHGC 0.55, UF 0.31, SEE ENVELOPE COMPLIANCE CERTIFICATE.
4. ALL DOORS TO BE CONSTRUCTED OF ALUMINUM FRAME WITH THERMAL BREAK, DOUBLE PANE WITH LOW-E, CLEAR, SHGC 0.55, UF 0.31, SEE ENVELOPE COMPLIANCE CERTIFICATE.
5. ALL EXTERIOR WINDOWS & DOORS TO COMPLY WITH OER FOR NOISE CONTROL AS REQUIRED FOR E-117 DESIGNATED AREA.
6. PROVIDE DOOR CLOSURE IN THE INSIDE OF ALL DOORS AT 1ST FLOOR & ROOF LEVEL.
7. ALL OPERABLE WINDOWS TO BE IN-SWING

LOT LINE WINDOW NOTES:

1. ALL LOT LINE WINDOWS TO BE PROTECTED WITH SPRINKLER HEAD ON THE OCCUPIED SIDE SPACED NO MORE THAN 6'-0" APART (NOT LESS THAN ONE HEAD PER WINDOW) AND A DISTANCE AWAY FROM THE GLASS TO INSURE COMPLETE GLASS WETTING UPON ACTIVATION, SEE SPRINKLER PLANS.
2. ALL LOT LINE WINDOWS SHALL BE WIRED, LAMINATED OR TEMPERED GLASS.
3. ALL LOT LINE WINDOWS SHALL COMPLY WITH SEC. BC 715.4
4. ALL LOT LINE WINDOW AREAS SHALL COMPLY WITH TABLE 704.8

LEGEND:

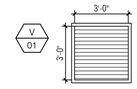
GLAZING LEGEND:

TG	TEMPERED INSULATED GLAZING
T	TEMPERED SINGLE PANE GLAZING
TO	TEMPERED OPAQUE INSULATED GLAZING
G	SINGLE PANE GLAZING
IG	INSULATED GLAZING
OG	OPAQUE INSULATED GLAZING
WG	WIRED GLASS
L	LOUVER (SEE MECH. DRAWINGS)
FG	FIRE RATED GLASS

NOTES:

ECC 502.4.1 AIR LEACKAGE OF WINDOW/DOOR ASSEMBLIES SHALL BE DETERMINED IN ACCORDANCE WITH AAMA/WDMA/CSA 101/I.S.2/A440, OR NFRC 400 BY AN ACCREDITED, INDEPENDENT LABORATORY, AND LABELED AND CERTIFIED BY THE MANUFACTURER AND SHALL NOT EXCEED 0.3 CFM PER SQUARE FOOT (1.5 L/S/M2), AND SWINGING DOORS NO MORE THAN 0.5 CFM PER SQUARE FOOT (2.6 L/S/M2).

ECC 502.4.2 CURTAIN WALL, STOREFRONT GLAZING AND COMMERCIAL-GLAZED SWINGING ENTRANCE DOORS AND REVOLVING DOORS SHALL BE TESTED FOR AIR LEACKAGE AT 1.57 POUNDS PER SQUARE FOOT (PSF) (75 PA) IN ACCORDANCE WITH ASTM E283. FOR CURTAIN WALLS AND STOREFRONT GLAZING, THE MAX. AIR LEACKAGE RATE SHALL BE 0.3 CUBIC FOOT PER MINUTE PER SQUARE FOOT (CFM/FT2) (5.5 M3/HXM2) OF FENESTRATION AREA. FOR COMMERCIAL GLAZED SWINGING ENTRANCE DOORS AND REVOLVING DOORS, THE MAXIMUM AIR LEACKAGE RATE SHALL BE 1.00 CFM/FT2 (18.3 M3/HXM2) OF DOOR AREA WHEN TESTED IN ACCORDANCE WITH ASTM E 283.



LOUVER (VENT AREA) PROVIDED
PER HOISTWAY = 9 SQ. FT.

ELEVATORS HOISTWAY VENT
HOISTWAY AREA = 27'-0" x 7'-0" = 189 SF
VENT AREA CALCULATION = 189 x 3½% = 6.6 SF
NUMBER OF CABS IN HOISTWAY = 3
MIN. REQUIRED VENT SIZE = 3 SF PER CAB

ELEVATOR HOISTWAY VENT NOTES:

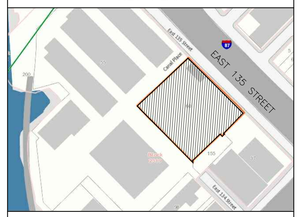
1. HOISTWAY LOUVER VENT TO HAVE BIRD AND INSECT SCREENS.
2. REFER TO FLOOR PLANS & ELEVATIONS FOR LOCATION.
3. REFER TO MECH. PLANS FOR SPECS.

LOUVER (VENT AREA) PROVIDED
PER STAIR SHAFT = 9 SQ. FT.

STAIRS "A" & "B" & "C" VENT
STAIR SHAFT AREA =
12'-4" x 6'-8" = 82 SF
14'-2"x6'-8" = 94 SF
15'-2"x6'-10" = 104 SF
VENT AREA CALCULATION
= 82 x 3½% =2.87 SF
= 94 x 3½% =3.29 SF
= 104 x 3½% =3.64 SF

NUMBER OF STAIR SHAFT = 3

KEY PLAN



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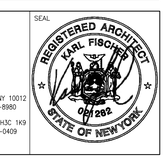

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
WINDOW ELEVATIONS

dob no

permit ############	project no. 15-23
date	sheet no. ---- OF
drawn	drawing no. A-603.00
checked KF	

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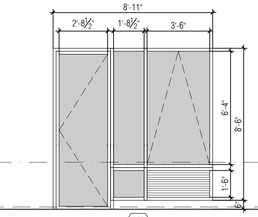

W 17A

LIGHT PROVIDED = 52 SQ. FT.
AIR PROVIDED =
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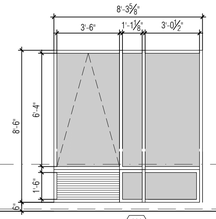
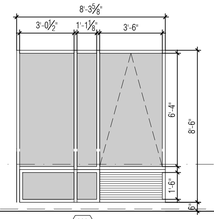


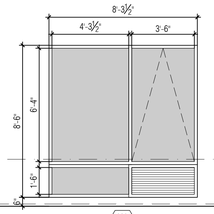
W 18

LIGHT PROVIDED = 49 SQ. FT.
AIR PROVIDED = 22 SQ. FT.



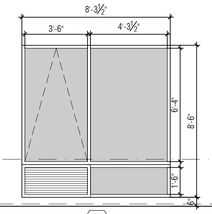
W 18A

LIGHT PROVIDED = 49 SQ. FT.
AIR PROVIDED = 22 SQ. FT.



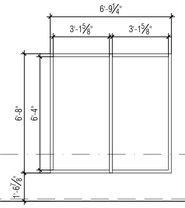
W 19

LIGHT PROVIDED = 49 SQ. FT.
AIR PROVIDED = 22 SQ. FT.



W 19A

LIGHT PROVIDED = 49 SQ. FT.
AIR PROVIDED = 22 SQ. FT.

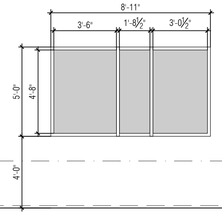


W 20

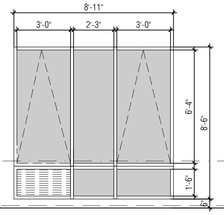
GLAZING LESS THAN
30" ABOVE FLOOR LEVEL
DOES NOT CONTRIBUTE
TO NATURAL LIGHT

FINISH FLOOR

T.O.Stair & Elev. Landing

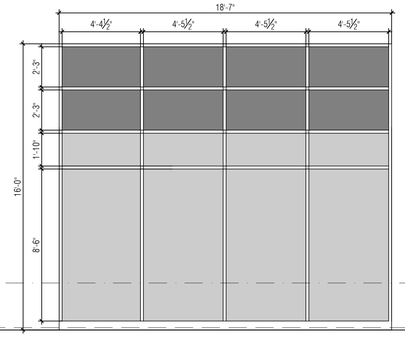


W 21

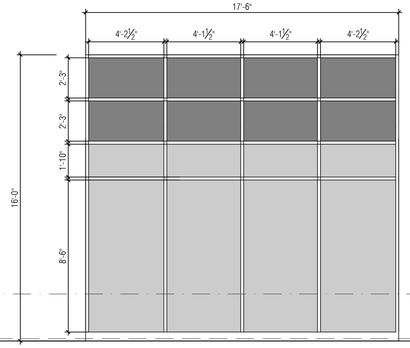


W 22

LIGHT PROVIDED = 53 SQ. FT.
AIR PROVIDED = 38 SQ. FT.



W 23

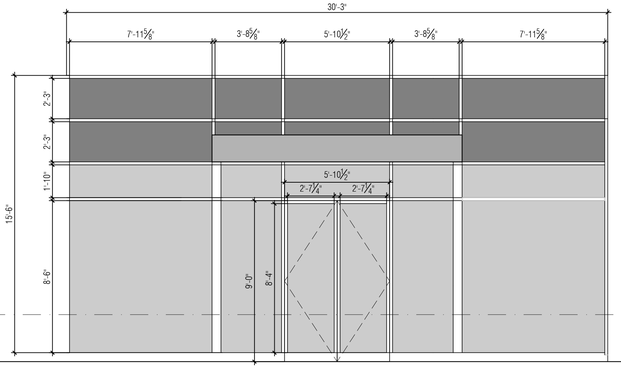


W 24

GLAZING LESS THAN
30" ABOVE FLOOR LEVEL
DOES NOT CONTRIBUTE
TO NATURAL LIGHT

FINISH FLOOR

T.O.Stair & Elev. Landing



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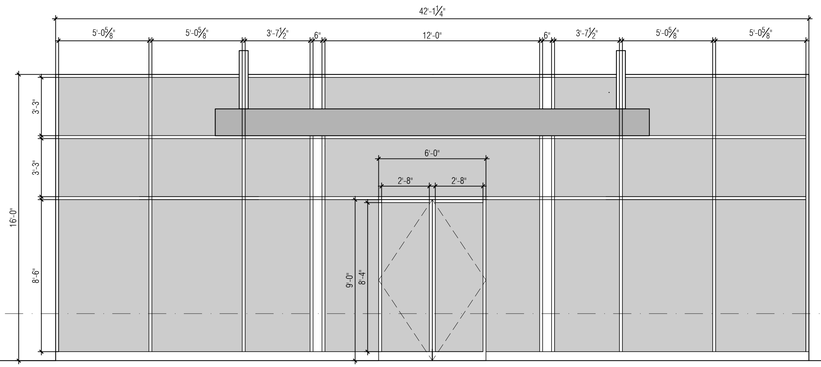


W 26

GLAZING LESS THAN
30" ABOVE FLOOR LEVEL
DOES NOT CONTRIBUTE
TO NATURAL LIGHT

FINISH FLOOR

T.O.Stair & Elev. Landing

WINDOW & EXTERIOR DOOR NOTES:

1. ALL WINDOW AND DOOR GLASS TO BE CLEAR NON-TINTED.
2. GC TO COORDINATE WINDOW & DOOR SWINGS WITH FLOOR PLANS.
3. ALL WINDOWS TO BE CONSTRUCTED OF ALUMINUM FRAME WITH THERMAL BREAK, DOUBLE PANE WITH LOW-E, CLEAR, SHGC 0.55, UF 0.31, SEE ENVELOPE COMPLIANCE CERTIFICATE.
4. ALL DOORS TO BE CONSTRUCTED OF ALUMINUM FRAME WITH THERMAL BREAK, DOUBLE PANE WITH LOW-E, CLEAR, SHGC 0.55, UF 0.31, SEE ENVELOPE COMPLIANCE CERTIFICATE.
5. ALL EXTERIOR WINDOWS & DOORS TO COMPLY WITH OER FOR NOISE CONTROL AS REQUIRED FOR E-117 DESIGNATED AREA.
6. PROVIDE DOOR CLOSURE IN THE INSIDE OF ALL DOORS AT 1ST FLOOR & ROOF LEVEL.
7. ALL OPERABLE WINDOWS TO BE IN-SWING

LOT LINE WINDOW NOTES:

1. ALL LOT LINE WINDOWS TO BE PROTECTED WITH SPRINKLER HEAD ON THE OCCUPIED SIDE SPACED NO MORE THAN 6'-0" APART (NOT LESS THAN ONE HEAD PER WINDOW) AND A DISTANCE AWAY FROM THE GLASS TO INSURE COMPLETE GLASS WETTING UPON ACTIVATION, SEE SPRINKLER PLANS.
2. ALL LOT LINE WINDOWS SHALL BE WIRED, LAMINATED OR TEMPERED GLASS.
3. ALL LOT LINE WINDOWS SHALL COMPLY WITH SEC. BC 715.4
4. ALL LOT LINE WINDOW AREAS SHALL COMPLY WITH TABLE 704.8

LEGEND:

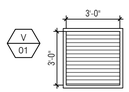
GLAZING LEGEND:

TG	TEMPERED INSULATED GLAZING
T	TEMPERED SINGLE PANE GLAZING
TO	TEMPERED OPAQUE INSULATED GLAZING
G	SINGLE PANE GLAZING
IG	INSULATED GLAZING
OG	OPAQUE INSULATED GLAZING
WG	WIRED GLASS
L	LOUVER (SEE MECH. DRAWINGS)
FG	FIRE RATED GLASS

NOTES:

ECC 502.4.1 AIR LEACKAGE OF WINDOW/DOOR ASSEMBLIES SHALL BE DETERMINED IN ACCORDANCE WITH AAMA/WDMA/CSA 101/I.S.2/A440, OR NFRC 400 BY AN ACCREDITED, INDEPENDENT LABORATORY, AND LABELED AND CERTIFIED BY THE MANUFACTURER AND SHALL NOT EXCEED 0.3 CFM PER SQUARE FOOT (1.5 L/S/M2), AND SWINGING DOORS NO MORE THAN 0.5 CFM PER SQUARE FOOT (2.6 L/S/M2).

ECC 502.4.2 CURTAIN WALL, STOREFRONT GLAZING AND COMMERCIAL-GLAZED SWINGING ENTRANCE DOORS AND REVOLVING DOORS SHALL BE TESTED FOR AIR LEACKAGE AT 1.57 POUNDS PER SQUARE FOOT (PSF) (75 PA) IN ACCORDANCE WITH ASTM E283. FOR CURTAIN WALLS AND STOREFRONT GLAZING, THE MAX. AIR LEACKAGE RATE SHALL BE 0.3 CUBIC FOOT PER MINUTE PER SQUARE FOOT (CFM/FT2) (5.5 M3/HXM2) OF FENESTRATION AREA. FOR COMMERCIAL GLAZED SWINGING ENTRANCE DOORS AND REVOLVING DOORS, THE MAXIMUM AIR LEACKAGE RATE SHALL BE 1.00 CFM/FT2 (18.3 M3/HXM2) OF DOOR AREA WHEN TESTED IN ACCORDANCE WITH ASTM E 283.



LOUVER (VENT AREA) PROVIDED
PER HOISTWAY = 9 SQ. FT.

ELEVATORS HOISTWAY VENT
HOISTWAY AREA = 27'-0" x 7'-0" = 189 SF
VENT AREA CALCULATION = 189 x 3½% = 6.6 SF
NUMBER OF CABS IN HOISTWAY = 3
MIN. REQUIRED VENT SIZE = 3 SF PER CAB

ELEVATOR HOISTWAY VENT NOTES:

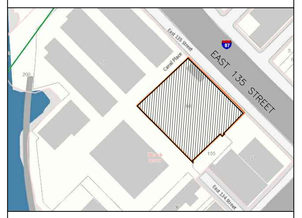
1. HOISTWAY LOUVER VENT TO HAVE BIRD AND INSECT SCREENS.
2. REFER TO FLOOR PLANS & ELEVATIONS FOR LOCATION.
3. REFER TO MECH. PLANS FOR SPECS.

LOUVER (VENT AREA) PROVIDED
PER STAIR SHAFT = 9 SQ. FT.

STAIRS "A" & "B" & "C" VENT
STAIR SHAFT AREA =
12'-4" x 6'-8" = 82 SF
14'-2"x6'-8" = 94 SF
15'-2"x6'-10" = 104 SF
VENT AREA CALCULATION
= 82 x 3½% =2.87 SF
= 94 x 3½% =3.29 SF
= 104 x 3½% =3.64 SF

NUMBER OF STAIR SHAFT = 3

KEY PLAN



BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

ISSUES/REVISIONS

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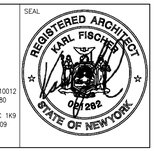
SEAL



project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
WINDOW ELEVATIONS

dob no

scale ##########	project no. 15-23
date	sheet no. ---- OF
drawn	drawing no. A-601.00
checked KF	

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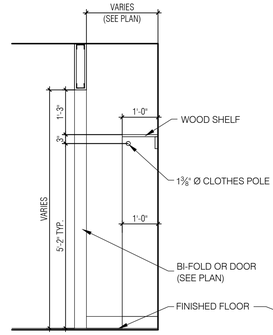

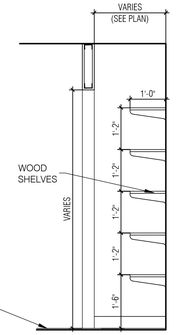

DOOR SCHEDULE

	LOCATION	TAG	SIZE			MATERIAL			DETAIL			FIRE RATING	HDWR SET	REMARKS
			WIDTH	HEIGHT	THICKNESS	DOOR	FRAME	SADDLE	HEAD	JAMB	SILL			
RESIDENTIAL UNITS														
	**APARTMENT ENTRANCE	A	3'-0"	7'-0"	1-3/4"	HM	HM					1-1/2 HR		
	BEDROOM	B	2'-10"	7'-0"	1-3/4"	SC	HM							
	BATHROOM	B1	2'-10"	7'-0"	1-3/4"	SC	HM							
	CLOSET	C	2'-0"	7'-0"	1-3/4"	SC	HM							
	CLOSET	C1	2'-4"	7'-0"	1-3/4"	SC	HM							
	CLOSET	C2	2'-6"	7'-0"	1-3/4"	SC	HM							
	CLOSET	C3	2'-8"	7'-0"	1-3/4"	SC	HM							
	CLOSET	C4	2'-10"	7'-0"	1-3/4"	SC	HM							
	CLOSET	C5	(2)1'-6"	7'-0"	1-3/4"	SC	HM							
	CLOSET	C6	(2)1'-9"	7'-0"	1-3/4"	SC	HM							
	CLOSET	C7	(2)2'-0"	7'-0"	1-3/4"	SC	HM							
	CLOSET	C8	(2)2'-3"	7'-0"	1-3/4"	SC	HM							
	CLOSET	C9	(2)2'-6"	7'-0"	1-3/4"	SC	HM							
	CLOSET	C10	(2)2'-9"	7'-0"	1-3/4"	SC	HM							
	LAUNDRY CLOSET	L	2'-6"	7'-0"	1-3/4"	SC	HM							
TYPICAL SERVICE	**STAIR	S	3'-0"	7'-0"	1-3/4"	HM	HM					1-1/2 HR		
	**STAIR AT BULKHEAD	S1	3'-0"	7'-0"	1-3/4"	HM	HM					3/4 HR		PROVIDE INSULATED DOOR
	**JANITOR CLOSET	J	3'-0"	7'-0"	1-3/4"	HM	HM					1-1/2 HR		
	**LAUNDRY ROOM	K	3'-0"	7'-0"	1-3/4"	HM	HM					1-1/2 HR		
	**REFUSE ROOM	R	3'-2"	7'-0"	1-3/4"	HM	HM					1-1/2 HR		SEE NOTE #2
	**COMPACTOR ROOM	R1	(2)3'-0"	7'-0"	1-3/4"	HM	HM					1-1/2 HR		PROVIDE 4" HEADER, 8" CMU FRAMING
	**STORAGE/ MECHANICAL ROOMS	M	3'-0"	7'-0"	1-3/4"	HM	HM					1-1/2 HR		PROVIDE 4" HEADER, 8" CMU FRAMING
	**STORAGE/ MECHANICAL ROOMS	M1	3'-0"	7'-0"	1-3/4"	HM	HM					1-1/2 HR		
	**STORAGE/ MECHANICAL ROOMS	M2	(2) 3'-0"	7'-0"	1-3/4"	HM	HM					1-1/2 HR		
	**STORAGE/ MECHANICAL ROOMS	M3	(2) 3'-6"	7'-0"	1-3/4"	HM	HM					1-1/2 HR		
	PACKAGE STORAGE	M4	3'-0"	7'-0"	1-3/4"	HM	HM							
	**RECREATION ROOM	D	(2)3'-0"	7'-0"	1-3/4"	HM	HM					1-1/2 HR		PROVIDE 1 1/2" HR FIRE RATED GLASS
	**RECREATION ROOM	D1	3'-0"	7'-0"	1-3/4"	HM	HM					1-1/2 HR		PROVIDE 1 1/2" HR FIRE RATED GLASS
	VESTIBULE	E	(2)3'-0"	7'-0"	1-3/4"	HM	HM							
	**EXTERIOR DOOR	E1	3'-0"	7'-0"	1-3/4"	HM	HM					3/4 HR		
	TOILET	T	3'-0"	7'-0"	1-3/4"	HM	HM							

DOOR & CLOSET DETAILS

NOT TO SCALE

DOOR FRAMING DETAIL (TYP.)

APARTMENT CLOSET & W.I.C. (TYPICAL)

APARTMENT LINEN CLOSET (TYPICAL)

DOOR TYPES

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

SCHEDULE LEGEND:

HM	HOLLOW METAL
WD	WOOD
SC	WOOD, SOLID CORE
AL	ALUMINUM
MTL	GALVANIZED STEEL TRACK

DOOR NOTES:

1. **SELF-CLOSING DOORS.
2. REFUSE ROOM DOORS TO BE MIN. OF 38" WIDE WITH AUTOMATIC DOOR OPENER AND OCCUPANCY SENSOR TO REMAIN IN OPEN POSITION WHILE THE ROOM IS OCCUPIED. DOOR MUST RETURN TO CLOSED POSITION IF THE ROOM IS NOT OCCUPIED OR IN CASE OF POWER FAILURE.
3. ALL BATHROOM DOORS TO HAVE ½" OF UNDERCUT.
4. DOOR UNDERCUT WILL VARY W/ FLOOR FINISH.
5. ALL DOORS TO BE INSTALLED AT THE SAME HEIGHT ABOVE CONC. SLAB, GC TO VERIFY FLOOR FINISHES.
6. GC TO COORDINATE DOOR SWINGS WITH FLOOR PLANS.
7. ALL FIRE RATED DOORS TO HAVE UL. NO.
8. ALL LOUVERS IN FIRE RATED DOORS TO HAVE F.L.F.D. WITH UL. NO.
9. ALL HM DOORS & FRAMES TO BE MIN. 18ga.; ALL HM FRAMES TO BE WELDED.
10. ALL DOORS W/ FUTURE SWING DIRECTION CHANGE FOR ADA TO HAVE FRAMES W/ KNOCK-OUTS FOR HINGE LOCATIONS.
11. ALL STAIR DOORS TO BE OPERABLE FROM BOTH SIDES OF DOOR.
12. ALL DOOR TO HAZARDOUS AREAS SHALL COMPLY WITH 1109.9.5 FOR DETECTABLE WARNINGS.
13. ALL DOORS AT SUB CELLAR POOL AND ADJACENT WET AREAS (IE:POOL SEATING AREA, POOL STORAGE/ EQUIPMENT ROOM, HALLWAY & LOCKERS ROOMS) TO BE STAINLESS STEEL.

LEGEND:

(?) DOOR TYPE

GLAZING LEGEND:

TG	TEMPERED INSULATED GLAZING
T	TEMPERED SINGLE PANE GLAZING
TO	TEMPERED OPAQUE INSULATED GLAZING
G	SINGLE PANE GLAZING
IG	INSULATED GLAZING
OG	OPAQUE INSULATED GLAZING
WG	WIRED GLASS
FG	FIRE RATED GLASS

KEY PLAN

BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.

ISSUES/REVISIONS

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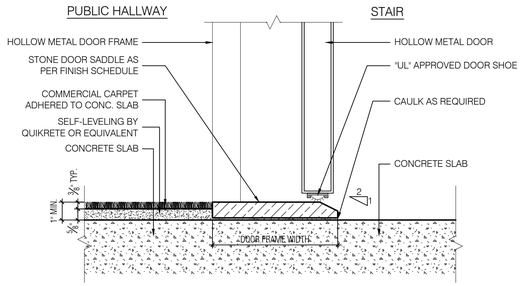
KARL FISCHER
021282
STATE OF NEW YORK

project title
RESIDENTIAL
DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

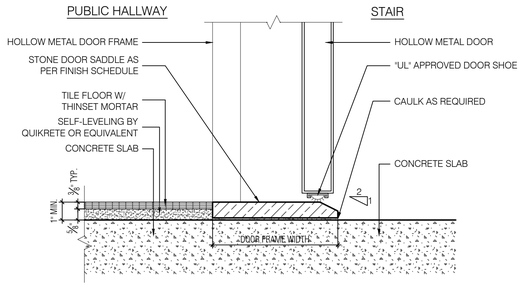
drawing title
DOOR AND FINISH SCHEDULES

dob no

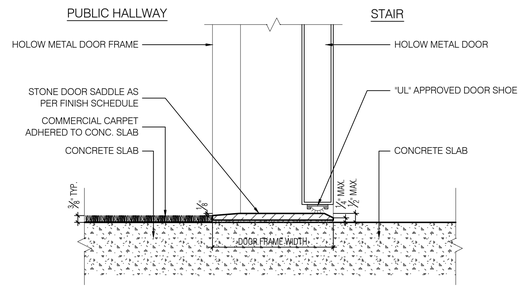
scale	project no.
1/4"=1'-0"	15–23
date	sheet no.
	61 OF
drawn	drawing no.
	A-700.00
checked	
KF	



STAIR DOOR



STAIR DOOR



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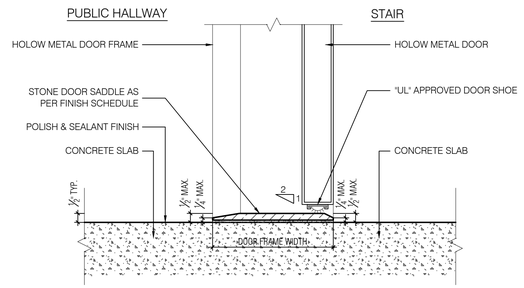
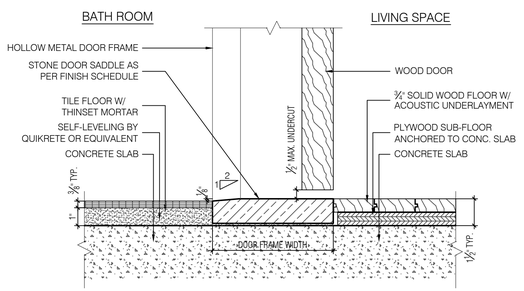
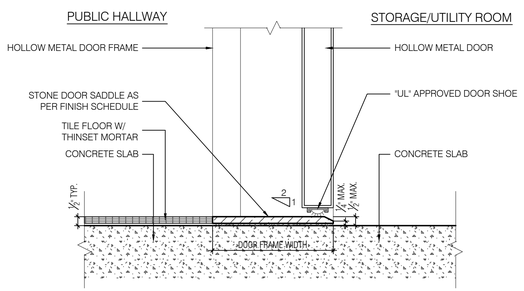


STAIR DOOR



BATH ROOM DOOR



STORAGE/UTILITY ROOM DOOR

KEY PLAN

BLOCK: 2319 LOT: 60

issue	rev	date	description
1		15/08/03	ISSUED TO D.O.B.
2		09/30/14	ISSUED TO DOB

ISSUES/REVISIONS

MEP ENGINEER: 09/19/14 ISSUED TO CLIENT

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SEAL

REGISTERED ARCHITECT KARL FISCHER 089292 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
200 EAST 135TH ST. BRONX, NEW YORK

drawing title
DOOR DETAILS

dob no

scale 3"=1'-0"	project no. 15-23
date	sheet no. 62 OF
drawn	drawing no. A-701.00
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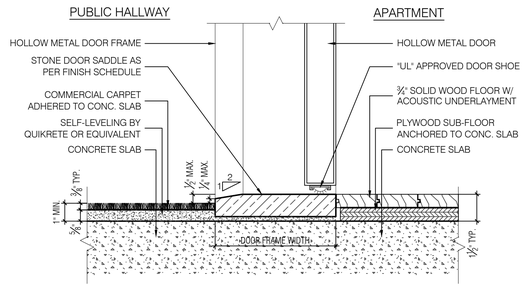

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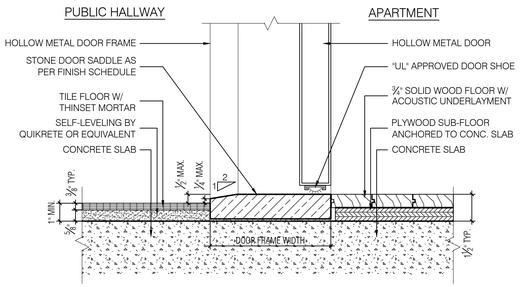

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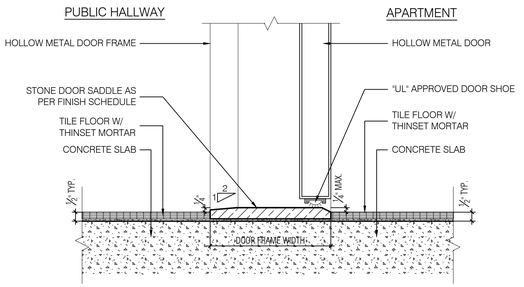

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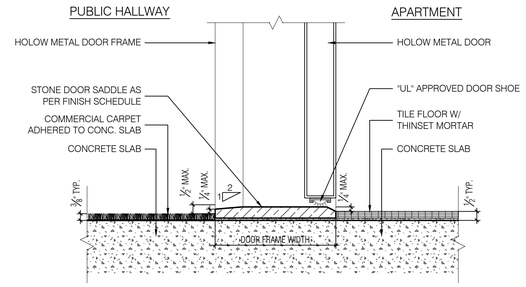

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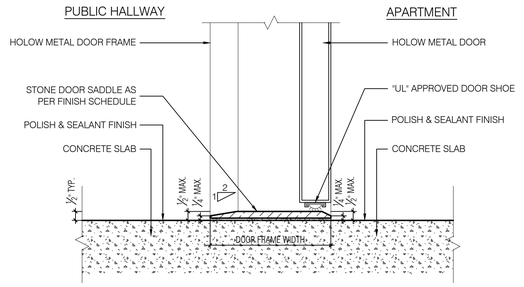

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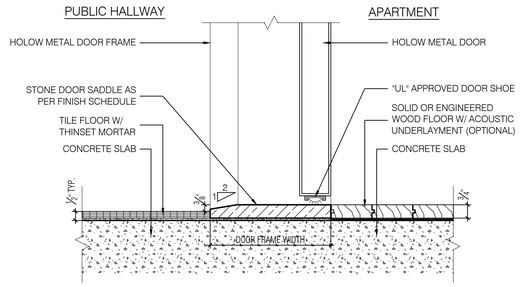

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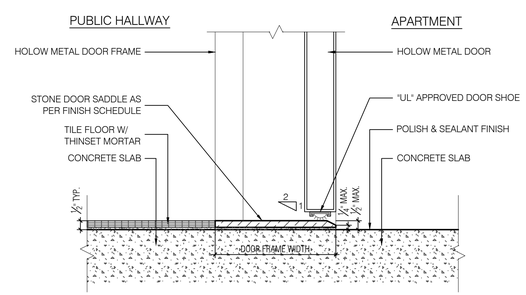

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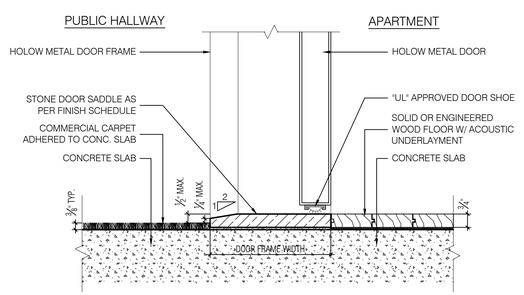

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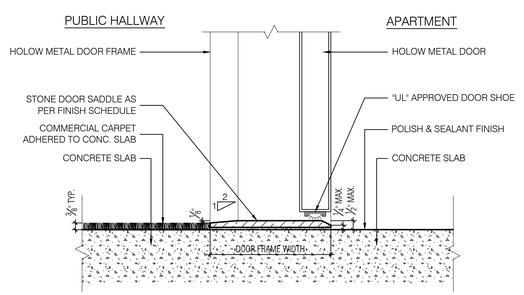
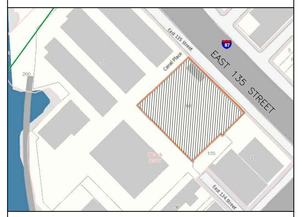


APARTMENT DOOR

KEY PLAN


EAST 135 STREET
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Lexington Ave
Park Ave
Madison Ave
5th Ave
Fifth Ave
Harlem River
Harlem River Drive
FDR Drive
Cross Bronx Expressway
Bruckner Expressway
Major Deegan Expressway
Willis Ave Bridge
Alexander Hamilton Bridge
Macombs Dam Bridge
Yankee Stadium
Yankee Stadium Parking
Yankee Stadium Parking
Yankee Stadium Parking

Appendix 13
Stamped/signed RAWP certification page

CERTIFICATION

I, Shaik A. Saad, am currently a registered Professional Engineer licensed in the State of New York. I performed professional engineering services and had primary direct responsibility designing the remedial program for the 200 East 135th Street site, site number 16CVCP013X.

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.

Name SHAIK SAAD

NYS PE License Number 071078

Signature

Date 10/5/15

I, Mark E. Robbins, am a Qualified Environmental Professional. I will have primary direct responsibility for implementation of the remedial program for the 200 East 135th Street Site, (NYC OER Site No. 16CVCP013X). 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

10/5/15

Date

Appendix 14
GPR Report

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

November 9, 2015

Mr. Cheskel Schwimmer
Chess Builders, LLC
63 Flushing Avenue
Brooklyn, NY 11205

Re: GPR Survey – 200 East 135th Street, Bronx NY
Hydro Tech Job No. 150133

Dear Mr. Schwimmer:

Hydro Tech Environmental, Corp. has performed a Ground Penetrating Radar (GPR) survey at the above referenced Site. The GPR survey was conducted to all accessible portions of the property for the presence of underground storage tanks.

SITE DETAILS

The Site is a vacant lot of approximately 48,976 square feet in area each. The main access to the Site is provided via East 135 Street, which is located to the north of the property. ***Figure 1*** provides a Site Plan.

DESCRIPTION OF FIELDWORK

The GPR survey was performed on June 10th, 2015 utilizing a GSSI SIR-3000 Control Unit and a 400-megahertz shielded antenna. Prior to the commencement of the survey, a visual inspection of the property was performed to identify specific areas where USTs could be present. ***Attachment #1*** provides pictures of the fieldwork.

The GPR takes one "scan" per set unit. The number of scans per unit is based upon the estimated sizes of targets. Based upon the typical size of a UST, the GPR was set to run at 50 scans per foot. As each scan is performed, the antenna emits specific radar amplitude into the subsurface. The amplitude of the radar reflected back to the antenna is based upon the differences in the dielectric constants of the subsurface materials. The difference in amplitude obtained during each scan is then graphically displayed on the Control Unit, which are then interpreted by the GPR operator the time of the survey. Additional interpretations are then conducted in the office utilizing specialized computer software.

GPR RESULTS

No Anomalies indicative of underground storage tanks was identified during this survey. ***Attachment #2*** provides scans from the GPR Survey Machine.

I hope that this information has proven valuable to this phase of your assessment. Should you have any questions, please feel free to contact our office at your convenience.

Very Truly Yours,
Hydro Tech Environmental, Corp.

Carlos Quinonez
Vice President of Operations

CQ/mw
Encl.

cc: Hydro Tech File 150178 w/Encs.

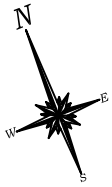
EXCLUSIONS & DISCLAIMER

The observations described in this report were made under the conditions stated therein. The conclusions presented in the report were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services or the time and budgetary constraints imposed by the Client.

Observations were made of the subject property and/or of structures on the subject property as indicated within the report. Where access to portions of the subject property or to structures on the subject property was unavailable or limited, **Hydro Tech Environmental, Corp**. renders no opinion as to the presence of non-hazardous or hazardous materials, or to the presence of indirect evidence relating to a non hazardous or hazardous materials, in that portion of the subject property or structure. In addition, **Hydro Tech Environmental, Corp.** renders no opinion as to the presence of hazardous materials, or the presence of indirect evidence relating to hazardous materials, where direct observation of the interior walls, floors, or ceiling of a structure on a subject property was obstructed by objects or coverings on or over these surfaces.

The conclusions and recommendations contained in this report are based in part, where noted, upon various types of chemical data and are contingent upon their validity. The data have been reviewed and interpretations were made in the report. As indicated within the report, some of the data may be preliminary "screening" level data, and should be confirmed with quantitative analyses if more specific information is necessary. Moreover, it should be noted that variations in the types and concentrations of contaminants and variations in their flow paths may occur due to seasonal water table fluctuations, past disposal practices, the passage of time, and other factors. Should additional chemical data become available in the future, the data should be reviewed, and the conclusions and recommendations presented herein modified accordingly.

Any GPR survey described above was performed in accordance with good commercial and customary practice and generally accepted protocols within the consulting industry. **Hydro Tech Environmental, Corp.** does not accept responsibility for survey limitations due to inherent technological limitations or site specific conditions, however, made appropriate effort to identify and notify the client of such limitations and conditions. In particular, please note that the survey described above does not represent a full utility clearance survey, and does not relieve any party of applicable legal obligations to notify a utility one-call service prior to excavating or drilling.



ADJACENT
MAJOR DEEGAN EXPRESSWAY

EAST 135th STREET

SIDEWALK

ADJACENT 4-STORY
COMMERCIAL

ADJACENT 5-STORY
RESIDENTIAL

PROPERTY
OUTLINE

ADJACENT 4-STORY
COMMERCIAL

0' 20' 40' 60'

SCALE IN FEET (FT.)

HYDRO TECH ENVIRONMENTAL CORP.

MAIN OFFICE:
77 ARKAY DRIVE, SUITE G
HAUPPAUGE, NEW YORK 11788
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NYC OFFICE:
15 OCEAN AVENUE, 2nd Floor
BROOKLYN, NEW YORK 11225
T (718)636-0800 F (718)636-0900

www.hydrotechenvironmental.com

200 East 135th Street
Bronx, NY.
HTE Job # 150133

Drawn By: C.Q.
Reviewed By:
Approved By: M.R
Date: 07/20/15
Scale: AS NOTED

TITLE:

FIGURE 1: SITE PLAN

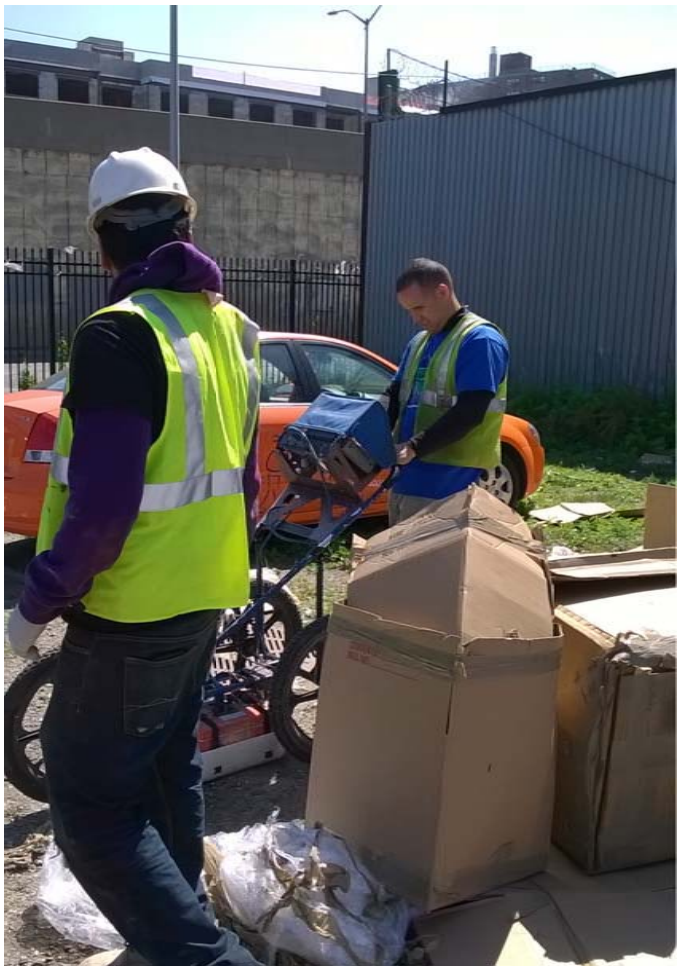
ATTACHMENT #1

MoveGREEN

MoveGREEN

CUBESMART
self storage + logistics

MoveGREEN



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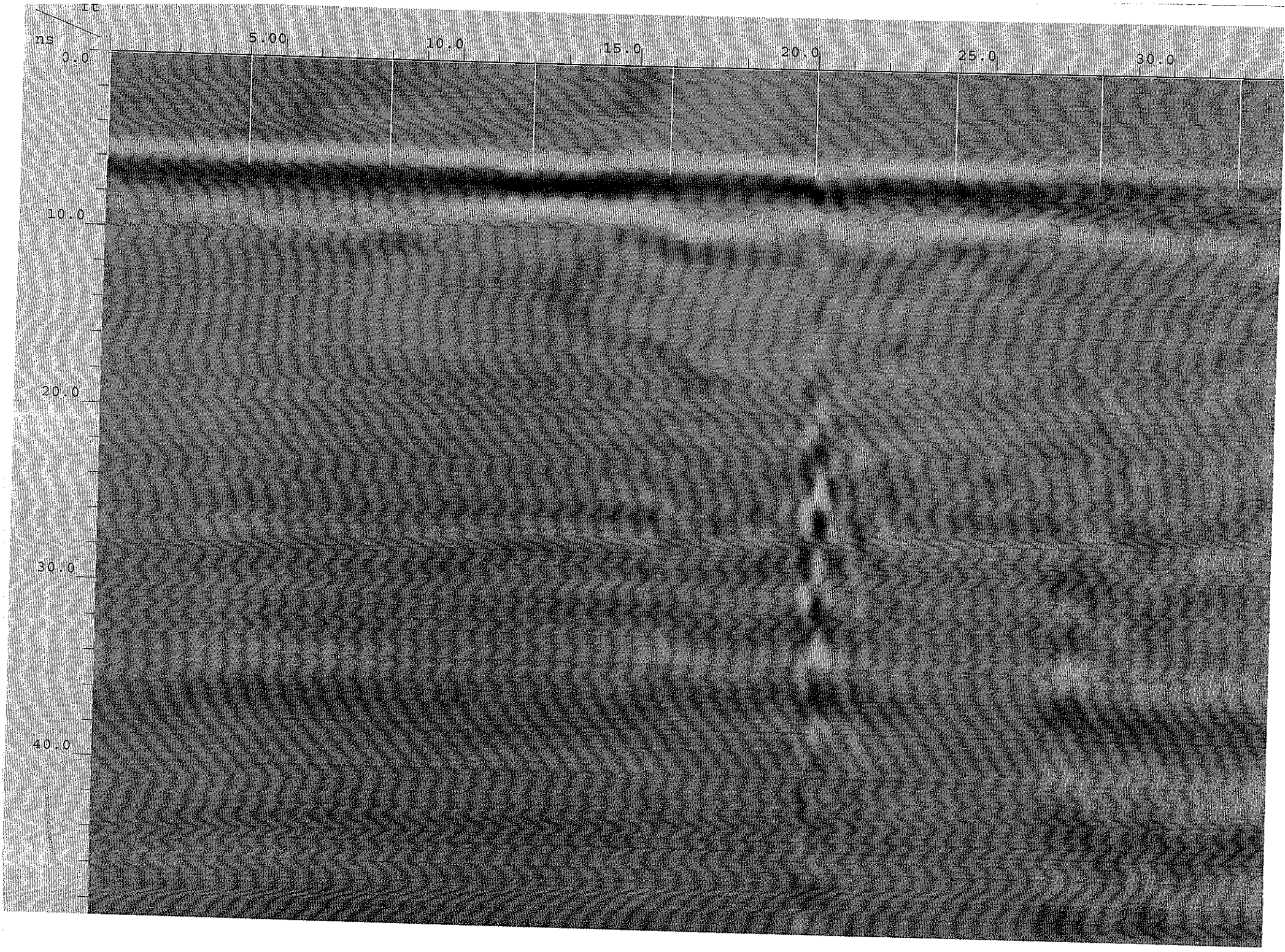
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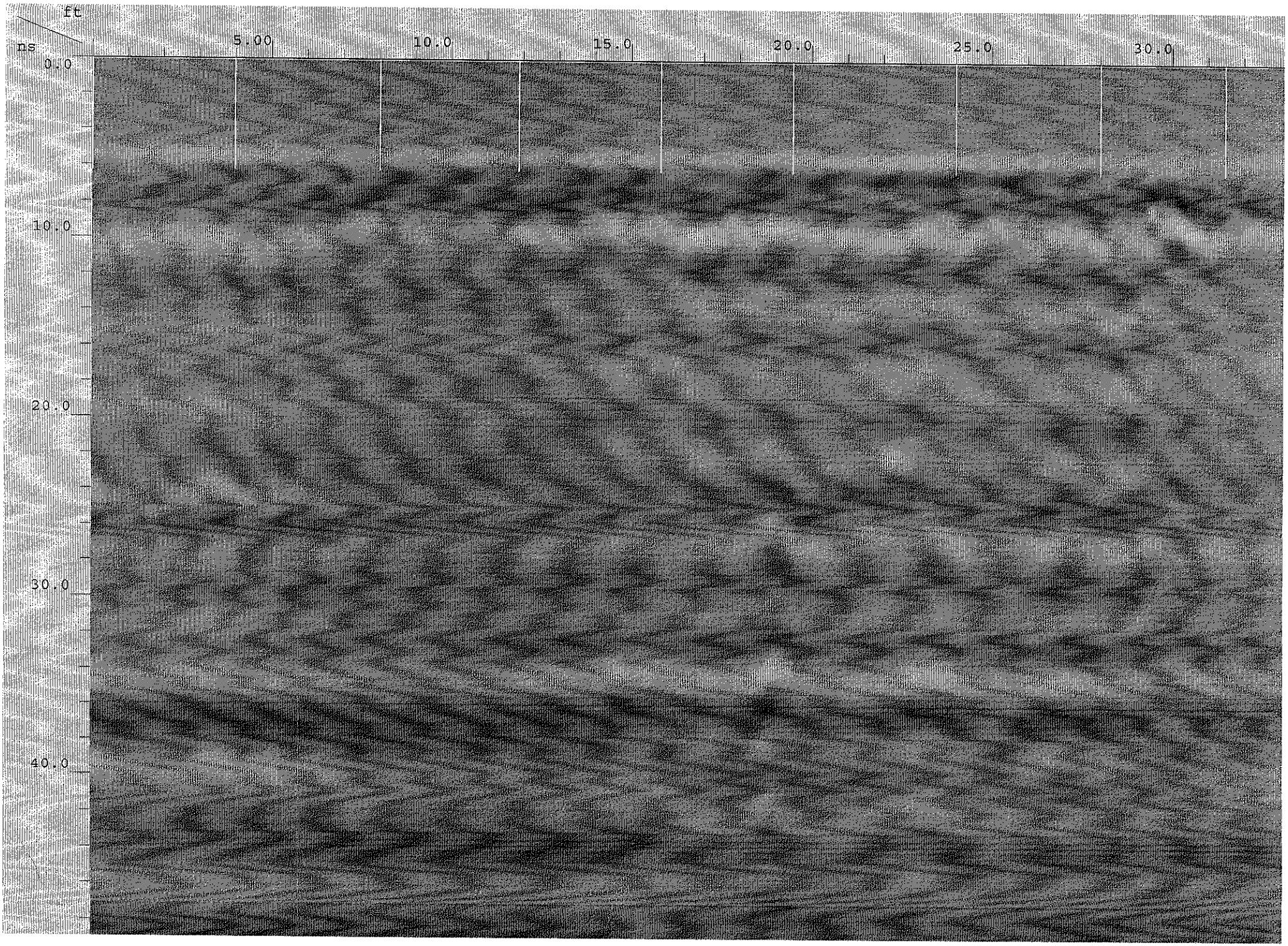
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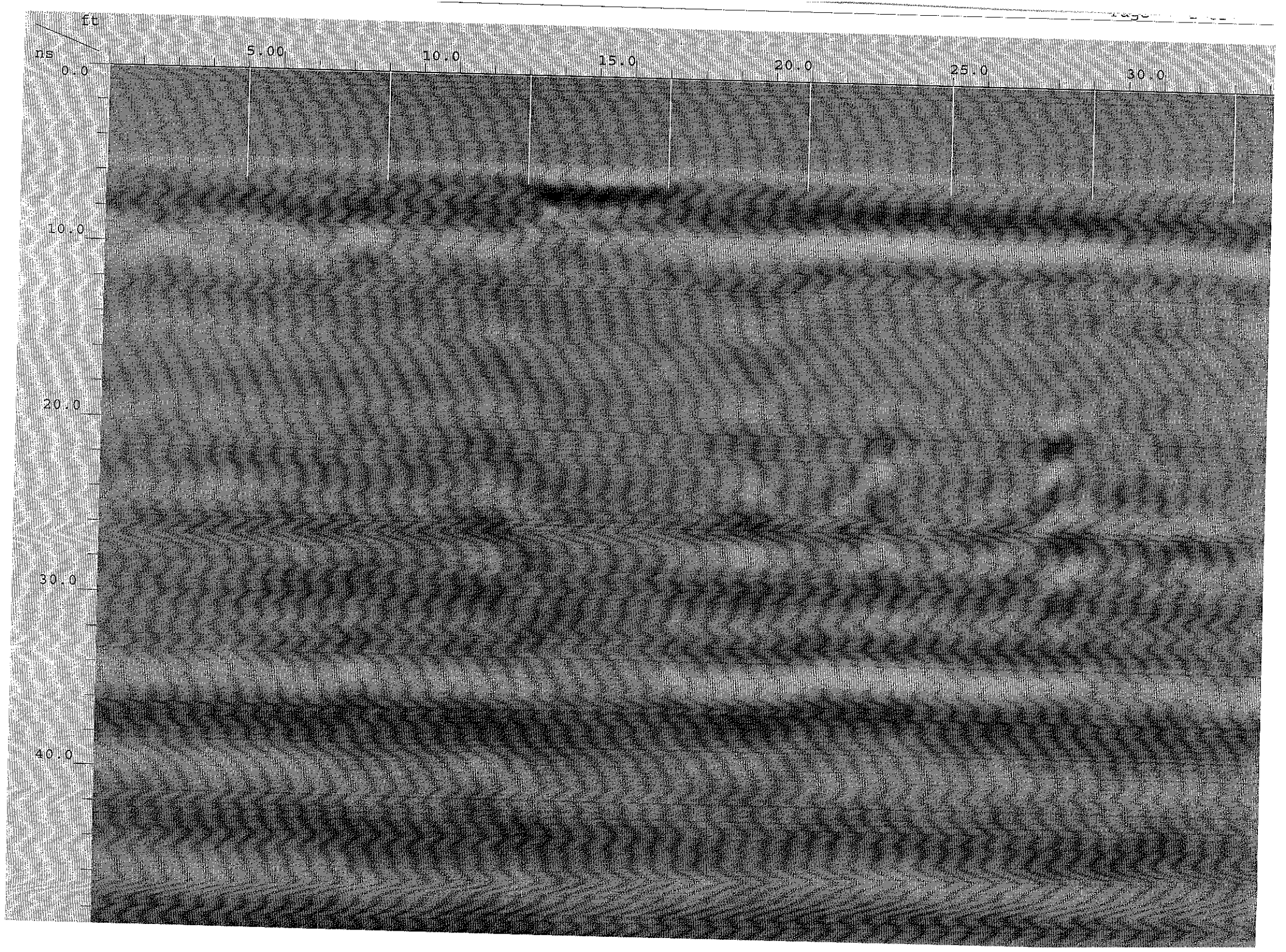
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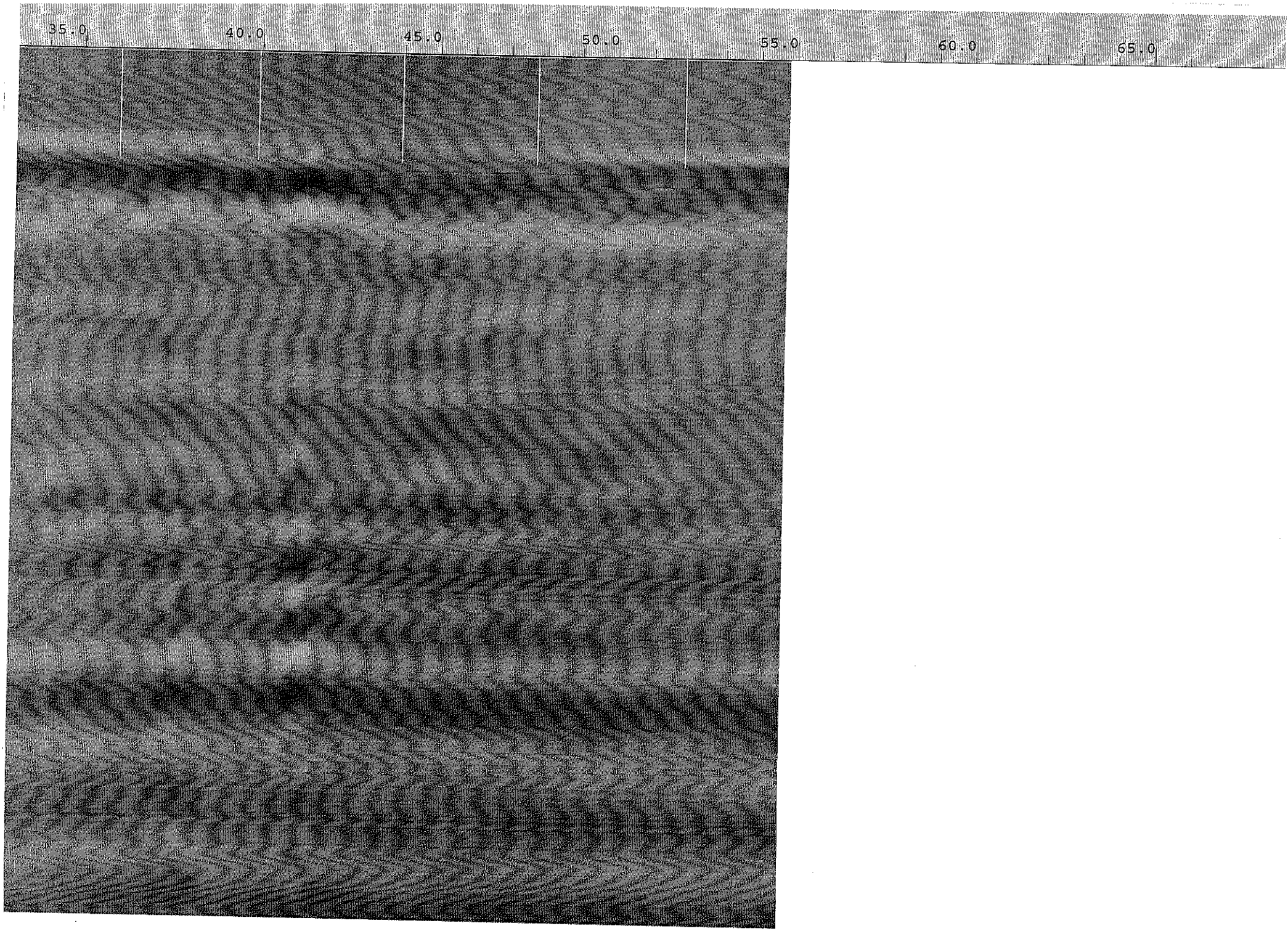
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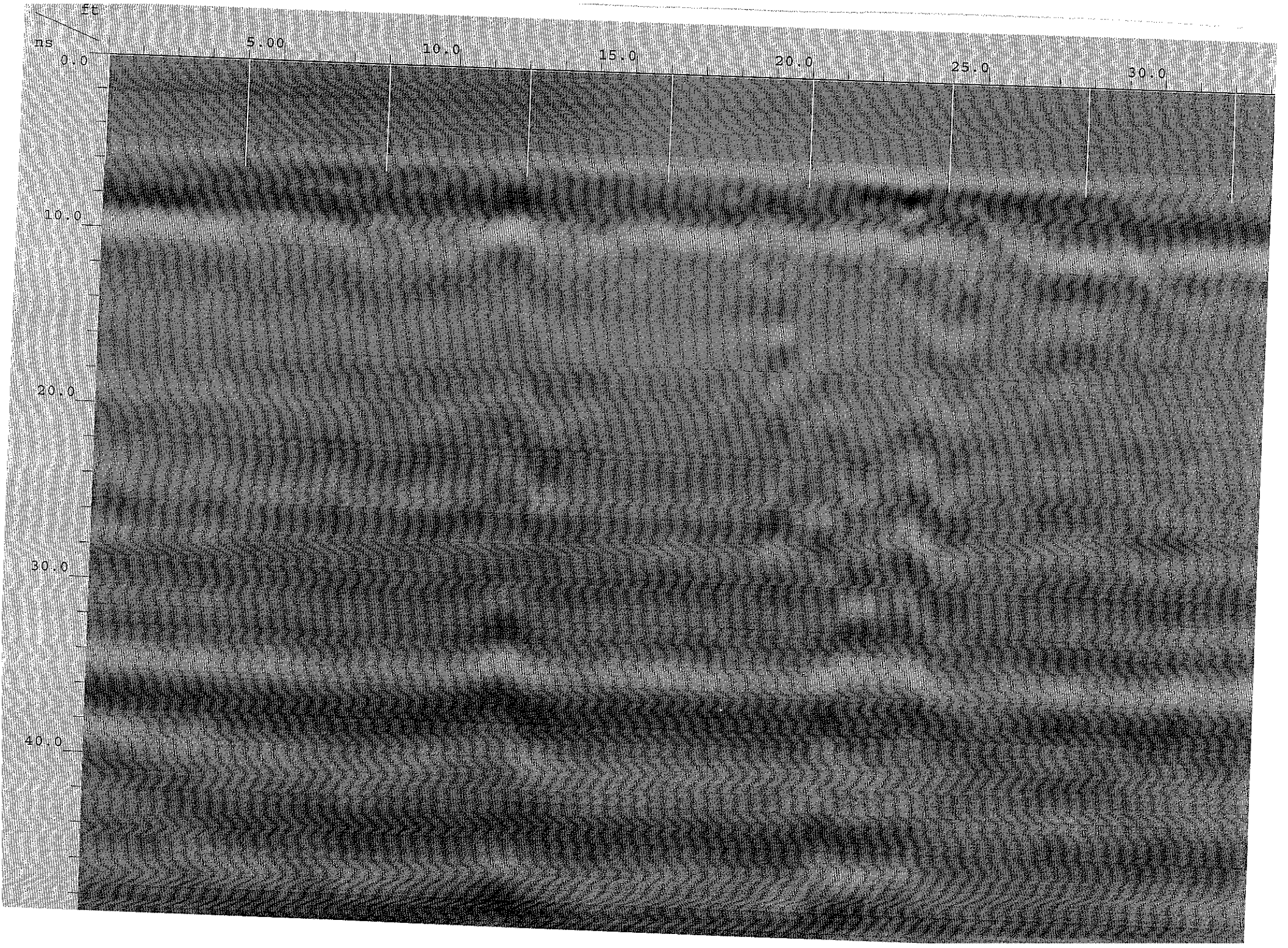
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200 EAST 135TH STREET

BRONX, NEW YORK

Remedial Action Work Plan

NYC VCP Number: 16CVCP013X
E-Designation Site Number: 13EHAN270X

Prepared for:

Chess Builders LLC
63 Flushing Avenue, 4th Floor
Brooklyn, New York
cschwimmer@cgsbuilders.com

Prepared by:

Hydro Tech Environmental, Corp.
15 Ocean Avenue, 2nd Floor
Brooklyn, New York 11225
ejohnston@hydrotechenvironmental.com
Phone: (631) 462-5866

SEPTEMBER 2015

REMEDIAL ACTION WORK PLAN
TABLE OF CONTENTS

FIGURES

APPENDICES

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
BCA	Brownfield Cleanup Agreement
MNA	Monitored Natural Attenuation
NOC	Notice of Completion
NYC BCP	New York City Brownfield Cleanup Program
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York State Department of Health and Mental Hygiene
NYCRR	New York Codes Rules and Regulations
NYC OER	New York City Office of Environmental Remediation
NYS DEC	New York State Department of Environmental Conservation
NYS DEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYS DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
ORC	Oxygen-Release Compound
OSHA	United States Occupational Health and Safety Administration
PE	Professional Engineer

PID	Photo Ionization Detector
QEP	Qualified Environmental Professional
QHHEA	Qualitative Human Health Exposure Assessment
RAOs	Remedial Action Objectives
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan or Plan
RCA	Recycled Concrete Aggregate
RD	Remedial Design
RI	Remedial Investigation
RMZ	Residual Management Zone
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVOC	Semi-Volatile Organic Compound
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

CERTIFICATION

I, Shaik A. Saad, am currently a registered Professional Engineer licensed in the State of New York. I performed professional engineering services and had primary direct responsibility designing the remedial program for the 200 East 135th Street site, site number 16CVCP013X.

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.

_____

Name

_____

NYS PE License Number

_____

Signature

_____

Date

PE Stamp

I, Mark E. Robbins, am a Qualified Environmental Professional. I will have primary direct responsibility for implementation of the remedial program for the 200 East 135th Street Site, (NYC OER Site No. 16CVCP013X). 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.

_____

QEP Name

_____

QEP Signature

_____

Date

EXECUTIVE SUMMARY

Chess Builders LLC is working with the NYC Office of Environmental Remediation (OER) in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a 48,976-square foot site located at 200 East 135th Street in the Port Morris section of Bronx, 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 to applicable laws and regulations.

Site Location and Background

The Site is located at 200 East 135th Street in the Port Morris neighborhood of Bronx, New York and is identified as Block 2319 and Lot 60 (previously part of Lot 55) on the New York City Tax Map. **Figure 1** shows the Site location. The Site is 48,976-square feet in area and is bounded by Exterior Street/Major Deegan Expressway to the north, the Harlem River to the south and west and Third Avenue to the east. A map of the site boundary is shown in **Figure 2**. The Site consists of a vacant lot; the ground surface consists of gravel.

Summary of Redevelopment Plan

The proposed future use of the Site will consist of a 25-story mixed-use commercial and residential use building. The proposed building will occupy 75% of the lot will have a basement that will occupy 10,248-square feet of the building footprint (25% of the entire lot); the basement will be used for residential amenity, laundry, a superintendent's office and building mechanics. The first floor will be used for parking, commercial space, and a residential lobby. The second floor will also be used for parking. Floors 3-25 will consist of residential units. The remainder of the Site will be reserved for the open air parking on the 1st and 2nd floors.

Excavation is anticipated to extend to 10 feet below grade surface (bgs) for construction of the basement level; this depth will extend below the water table, which is approximately 8-12 feet bgs. Approximately 7,072 tons of soil will be excavated and removed from this Site.

Layout of the proposed site development is presented in **Figure 3**. The current zoning designation is M1-3/R8/MX-1. The proposed use is consistent with existing zoning for the property.

Summary of the Surrounding Property

The vicinity of the Site consists of residential, commercial and industrial properties. The ground surfaces in the vicinity of the Site consist of gravel, asphalt and bare soil. The Site is located on the south side of the Major Deegan Expressway and is bordered by commercial buildings to the east and commercial storage buildings to west and south, beyond which is the Harlem River. The results of the Site inspection and an evaluation of the United States Geological Survey (USRS) 7 ½-Minute Topographic Map containing the properties indicate there are no sensitive receptors (such as schools, hospitals or day-care facilities) present within a 0.125-mile radius of the Site.

Summary of the Past Site Uses and Areas of Concern

Based upon the review of a Site Investigation by others that cited a previous Phase I, the following Site history was established. The Site was historically part of Lot 55, which was utilized as a railroad freight yard, a coal yard, a warehouse and various industrial uses. The Site is associated with NYSDEC Spill #0001384 which was reported on May 4, 2000 and subsequently closed on June 21, 2000 following the excavation and offsite removal of approximately 4,000 cubic yards of soil and the collection of post-excavation confirmatory endpoint samples from historical Lot 55.

The AOCs identified for this site include:

1. The historical use of the Site as a railroad freight yard, a coal yard, a warehouse and various manufacturing purposes
2. The commercial use of surrounding properties includes furniture restoration.

Summary of Work Performed under the Remedial Investigation

Hydro Tech Environmental, Corp. performed the following scope of work at the Site in June and July of 2015:

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 five (5) soil vapor probes throughout the Site and collected six (6) samples for chemical analysis, including one (1) outdoor ambient air sample; and
6. At the request of NYCOER, collected one (1) additional ambient outdoor air sample in the southern portion of the site due to an elevated concentration of tetrachloroethylene in the original outdoor ambient air sample.

Summary of Findings of Remedial Investigation

1. Elevation of the property is approximately 15 feet.
2. Depth to groundwater ranges from 8.85 to 12.02 feet at the Site.
3. Groundwater flow is generally from south to north beneath the Site.
4. Bedrock was not encountered at the Site.
5. The stratigraphy of the site, from the surface down to about 12 feet bgs, is classified as fill consisting of a mixture of gravel, sand, rocks and possibly other construction debris. Drilling did not occur deeper than 12 feet bgs and bedrock was not encountered.
6. 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 trace concentrations of several volatile organic compounds (VOCs) with acetone (max. 0.068 mg/kg) exceeding Unrestricted Use SCOs in two deep samples. Several semi-volatile

organic compounds (SVOCs) consisting of Polycyclic Aromatic Hydrocarbons (PAH) compounds were detected with benz(a)anthracene (max. 5.70 mg/kg), benzo(a)pyrene (max. 1.14 mg/kg), benzo(b)fluoranthene (max. 1.24 mg/kg), benzo(k)fluoranthene (max. 1.21 mg/kg), chrysene (max. 5.49 mg/kg), dibenzo(a,h)anthracene (max. 0.453 mg/kg) and indeno(1,2,3-cd)pyrene (max. 0.874 mg/kg) exceeding Restricted Residential SCOs in five shallow and one deep sample. Pesticides were detected in four shallow samples and one deep sample at concentrations exceeding Unrestricted Use SCOs, including 4,4'-DDD (max. 0.0948 mg/kg), 4,4'-DDE (max. 0.0357 mg/kg) and 4,4'DDT (max. 0.177 mg/kg). Total PCBs (max. 0.72 mg/kg) exceeded Unrestricted Use SCOs in four shallow samples. Several metals including barium (max. 635 mg/kg), copper (max. 158 mg/kg), lead (max. 618 mg/kg), mercury (max. 0.36 mg/kg), nickel (max. 44.30 mg/kg), selenium (max. 12.70 mg/kg) and zinc (max. 497 mg/kg) were detected in all shallow samples and three deep samples exceeding Unrestricted Use SCOs. Of these metals, barium and lead also exceeded Restricted Residential SCOs in two shallow samples. Overall, soil chemistry is unremarkable and is similar to sites with historic fill in New York City.

7. 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 in any sample. Five (5) VOCs were detected above GQS in MW-1, including 1,2,4-Trimethylbenzene (500 µg/L), 1,2-Dichlorobenzene (1,200 µg/L), acetone (1,500 µg/L), naphthalene (1,500 µg/L) and n-Butylbenzene (670 µg/L). No other VOCs were detected in the other two groundwater samples. Several SVOCs were detected but only phenol (5.6 µg/L) was detected in MW-3 at a concentration exceeding its GQS. One pesticide 4,4'-DDD was detected in MW-1 at a concentration less than GQS. Several dissolved metals were identified in groundwater but only antimony (40 ug/L), lead (27 ug/L), magnesium (max. 145,000 ug/L), manganese (max. 3,260 ug/L), selenium (max. 60 ug/L) and sodium (max. 782,000 ug/L) exceeded their respective GQS.

8. 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 collected during the RI showed moderate levels of petroleum-related VOCs. The petroleum related compounds ranged from 1.10 µg/m^3 to 110 µg/m^3. N-Hexane was the highest detected compound with a concentration of 110 µg/m^3 in SV-5. Total concentrations of petroleum-related VOCs (BTEX) was 100 µg/m^3 in SV-5. Chlorinated VOCs were also detected with tetrachloroethylene (PCE) detected at a maximum of 240 µg/m^3. Concentration for PCE was above the monitoring level ranges established within the State DOH soil vapor guidance matrix. PCE, trichloroethylene and carbon tetrachloride were also detected in the original outdoor ambient air sample but not in the second resample.

Summary of the Remedial Action

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

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan (CPP);
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds;
3. Establishment of Track 4 Site-Specific Soil Cleanup Objectives (SCOs);
4. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility. A Waste Characterization Report documenting sample procedures, location, analytical results shall be submitted to NYCOER prior to start of remedial action;

5. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas;

6. Excavation and removal of soil/fill exceeding Track 4 Site-Specific SCOs. For development purposes, the entire footprint of the Site will be excavated to a depth of approximately 10feet below grade for construction of the building slab and approximately 10 feet in the area of the proposed cellar. The rear yard will be excavated 2 feet and capped with asphalt. An estimated 7,072 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 onsite;

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 underground storage tanks (USTs) 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 licensed or 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 onsite;

11. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs;

12. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations;

13. Construction of an engineered composite cover consisting of 6 inch thick concrete slab across the footprint of the new building and 6-inch thick asphalt cap in the rear yard area;

14. Installation of a vapor barrier/waterproofing system beneath the concrete building slab and outside of sub-grade foundation sidewalls to mitigate soil vapor migration into the building. The vapor barrier system will consist of 46-mil Grace Preprufe 300R waterproofing membrane by beneath the slab and will be extended up to grade level by attaching it to the exterior sides of foundation walls using Grace 32-mil Preprufe 160R waterproofing membrane;

15. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations;

16. Performance of all activities required for the remedial action, including acquisition of required permits requirements and attainment of pretreatment requirements, in compliance with applicable laws and regulations;

17. Submission of a Remedial action report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP;

18. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency; and

19. 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.

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 that show the location of contamination at the site, and describes the plans to clean up the site to protect public health and the environment.

This cleanup plan provides a very high level of protection for neighboring communities. This cleanup plan 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: 200 East 135th Street, Bronx, New York 10451
- NYC Voluntary Cleanup Program Project Number: 16CVCP013X

PROJECT CONTACTS:

- OER Project Manager: Sarah Pong, 212-442-8342
- Site Project Manager: Morgan Violette, 718-636-0800
- Site Safety Officer: Morgan Violette, 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 contaminant sources present on the property. The cleanup plan has been designed to address all contaminant sources that have been identified during the study of this property.

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

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

Health and Safety Plan. This cleanup plan includes a Health and Safety Plan that is designed to protect community residents and on-Site workers. The elements of this RAWP are in compliance with safety requirements of the United States Occupational Safety and Health Administration. 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 Morgan Violette of Hydro Tech Environmental, Corp. and can be reached at 718-636-0800.

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.

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 NYC noise control standards. If you observe problems in these areas, please contact the onsite Project Manager Morgan Violette at (718) 636-0800 or NYC Office of Environmental Remediation Project Manager Sarah Pong at (212) 788-8841.

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

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

Hours of Operation. The hours for operation of cleanup will comply with the NYC Department of Buildings construction code requirements or according to specific variances issued by that agency. For this cleanup project, the hours of operation are 7:00 AM to 5:00 PM.

Signage. While the cleanup is in progress, a placard will be prominently posted at the main entrance of the property with a laminated project Fact Sheet that states that the project is in the NYC Voluntary Cleanup Program, provides project contact names and numbers, and 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 Morgan Violette at (718) 636-0800or mviolette@hydrotechenvironmental.com, the NYC Office of Environmental Remediation Project Manager Sarah Pong at (212) 788-8841 or Spong@dep.nyc.gov, or call 311 and mention the Site is in the NYC Voluntary Cleanup Program.

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

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

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

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

Trucks and Covers. Loaded trucks leaving the Site will be covered in compliance with applicable laws and regulations to prevent dust and odor. Trucks will be properly recorded in logs and records and placarded in compliance with applicable City, State and Federal laws, including those of the New York State Department of Transportation. If loads contain wet material that can leak, truck liners will be used. All transport of materials will be performed by licensed truckers and in compliance with all laws and regulations.

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

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

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

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

Final Report. The results of all cleanup work will be fully documented in a final report (called a Remedial Action Report) that will be available for public review online. A link to the online document repository is listed on the first page of this Community Protection Statement document and the public library with Internet access nearest the Site is the New York Public Library- Mott Haven Library located at 321 East 140th Street, Bronx, New York 10454.

Long-Term Site Management. To provide long-term protection after the cleanup is complete, the property owner may 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. Requirements that the property owner must comply with are 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.

REMEDIAL ACTION WORK PLAN

1.0 PROJECT BACKGROUND

Chess Builders LLC has enrolled in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 200 East 135th Street in the Port Morris section of Bronx, New York (the "Site"). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 SITE LOCATION AND BACKGROUND

The Site is located at 200 East 135th Street in the Port Morris neighborhood of Bronx, New York and is identified as Block 2319 and Lot 60 on the New York City Tax Map. **Figure 1** shows the Site location. The Site is 48,976-square feet and is bounded by Exterior Street to the north, the Harlem River to the south and west and Third Avenue to the east. A map of the site boundary is shown in **Figure 2**. The Site consists of a vacant lot; the ground surface consists of gravel and bricks.

1.2 REDEVELOPMENT PLAN

The proposed future use of the Site will consist of a 25-story mixed-use commercial and residential use building. The proposed building will occupy 75% of the lot and will have a basement that will occupy 10,248-square feet of the building footprint (25% of the entire lot); the basement will be used for residential amenity, laundry, a superintendent's office and building mechanics. The first floor will be used for parking, commercial space, and a residential lobby. The second floor will also be used for parking. Floors 3-25 will consist of residential

units. The remainder of the Site will be reserved for the open air parking on the 1st and 2nd floors.

Excavation is anticipated to extend to 10 feet below grade surface (bgs) for the construction of the basement level; this depth will extend below the water table, which is approximately 8-12 feet bgs. Approximately 7,072 tons of soil will be excavated and removed from the Site.

Layout of the proposed site development is presented in **Figure 3**. The current zoning designation is M1-3/R8/MX-1. The proposed use is consistent with existing zoning for the property.

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The vicinity of the Site consists of residential, commercial and industrial properties. The ground surfaces in the vicinity of the Site consist of gravel, asphalt and bare soil. The Site is located on the south side of the Major Deegan Expressway and is bordered by commercial buildings to the east and commercial storage buildings to west and south, beyond which is the Harlem River. The results of the Site inspection and an evaluation of the United States Geological Survey (USRS) 7 ½-Minute Topographic Map containing the properties indicate there are no sensitive receptors (such as schools, hospitals or day-care facilities) present within a 0.125-mile radius of the Site. **Figure 4** shows the surrounding land usage.

1.4 SUMMARY OF PAST USES OF SITE AND AREAS OF CONCERN

A remedial investigation was performed and the results are documented in a companion document called "*Remedial Investigation Report, 200 East 135th Street, Bronx, New York, dated September 2015* (RIR).

Based upon the review of a Site Investigation by others that cited a previous Phase I, the following Site history was established. The Site was historically part of Lot 55, which was utilized as a railroad freight yard, a coal yard, a warehouse and various industrial uses. The Site is associated with NYSDEC Spill #0001384 which was reported on May 4, 2000 and subsequently closed on June 21, 2000 following the excavation and offsite removal of approximately 4,000 cubic yards of soil and the collection of post-excavation confirmatory endpoint samples from historical Lot 55.

The AOCs identified for this site include:

1. The historical use of the Site as a railroad freight yard, a coal yard, a warehouse and various manufacturing purposes.
2. The commercial use of surrounding properties includes furniture restoration.

1.5 SUMMARY OF THE WORK PERFORMED UNDER THE REMEDIAL INVESTIGATION

Hydro Tech Environmental, Corp. performed the following scope of work at the Site in June and July of 2015:

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 five (5) soil vapor probes throughout the Site and collected six (6) samples for chemical analysis, including one (1) outdoor ambient air sample; and
6. At the request of NYCOER, collected one (1) additional ambient outdoor air sample in the southern portion of the site due to an elevated concentration of tetrachloroethylene in the original outdoor ambient air sample.

1.6 SUMMARY OF ENVIRONMENTAL FINDINGS

1. Elevation of the property is approximately 15 feet.
2. Depth to groundwater ranges from 8.85 to 12.02 feet at the Site.
3. Groundwater flow is generally from south to north beneath the Site.

4. Bedrock was not encountered at the Site.

5. The stratigraphy of the site, from the surface down to about 12 feet bgs, is classified as fill consisting of a mixture of gravel, sand, rocks and possibly other construction debris. Drilling did not occur deeper than 12 feet bgs and bedrock was not encountered.

6. 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 trace concentrations of several volatile organic compounds (VOCs) with acetone (max. 0.068 mg/kg) exceeding Unrestricted Use SCOs in two deep samples. Several semi-volatile organic compounds (SVOCs) consisting of Polycyclic Aromatic Hydrocarbons (PAH) compounds were detected with benz(a)anthracene (max. 5.70 mg/kg), benzo(a)pyrene (max. 1.14 mg/kg), benzo(b)fluoranthene (max. 1.24 mg/kg), benzo(k)fluoranthene (max. 1.21 mg/kg), chrysene (max. 5.49 mg/kg), dibenzo(a,h)anthracene (max. 0.453 mg/kg) and indeno(1,2,3-cd)pyrene (max. 0.874 mg/kg) exceeding Restricted Residential SCOs in five shallow and one deep sample. Pesticides were detected in four shallow samples and one deep sample at concentrations exceeding Unrestricted Use SCOs, including 4,4'-DDD (max. 0.0948 mg/kg), 4,4'-DDE (max. 0.0357 mg/kg) and 4,4'DDT (max. 0.177 mg/kg). Total PCBs (max. 0.72 mg/kg) exceeded Unrestricted Use SCOs in four shallow samples. Several metals including barium (max. 635 mg/kg), copper (max. 158 mg/kg), lead (max. 618 mg/kg), mercury (max. 0.36 mg/kg), nickel (max. 44.30 mg/kg), selenium (max. 12.70 mg/kg) and zinc (max. 497 mg/kg) were detected in all shallow samples and three deep samples exceeding Unrestricted Use SCOs. Of these metals, barium and lead also exceeded Restricted Residential SCOs in two shallow samples. Overall, soil chemistry is unremarkable and is similar to sites with historic fill in New York City.

7. 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 in any sample. Five (5) VOCs were

detected above GQS in MW-1, including 1,2,4-Trimethylbenzene (500 µg/L), 1,2-Dichlorobenzene (1,200 µg/L), acetone (1,500 µg/L), naphthalene (1,500 µg/L) and n-Butylbenzene (670 µg/L). No other VOCs were detected in the other two groundwater samples. Several SVOCs were detected but only phenol (5.6 µg/L) was detected in MW-3 at a concentration exceeding its GQS. One pesticide 4,4'-DDD was detected in MW-1 at a concentration less than GQS. Several dissolved metals were identified in groundwater but only antimony (40 ug/L), lead (27 ug/L), magnesium (max. 145,000 ug/L), manganese (max. 3,260 ug/L), selenium (max. 60 ug/L) and sodium (max. 782,000 ug/L) exceeded their respective GQS.

8. 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 collected during the RI showed moderate levels of petroleum-related VOCs. The petroleum related compounds ranged from 1.10 µg/m^3 to 110 µg/m^3. N-Hexane was the highest detected compound with a concentration of 110 µg/m^3 in SV-5. Total concentrations of petroleum-related VOCs (BTEX) was 100 µg/m^3 in SV-5. Chlorinated VOCs were also detected with tetrachloroethylene (PCE) detected at a maximum of 240 µg/m^3. Concentration for PCE was above the monitoring level ranges established within the State DOH soil vapor guidance matrix. PCE, trichloroethylene and carbon tetrachloride were also detected in the original outdoor ambient air sample but not in the second resample.

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 results of 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.

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.

3.0 REMEDIAL ALTERNATIVES ANALYSIS

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

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

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

- Alternative 1 involves:
    - Selection of NYSDEC 6NYCRR Part 375 Unrestricted Use (Track 1) Soil Cleanup Objectives (SCOs).
    - Removal of all soil/fill exceeding Track 1 Unrestricted Use SCOs throughout the Site and confirmation that Track 1 Unrestricted Use SCOs have been achieved with post-excavation confirmation sampling. Based on the results of the Remedial Investigation, it is expected that this alternative would require excavation across the entire Site to a depth of at least 12 feet for the removal of all historic fill. If soil/fill containing analytes at concentrations above Unrestricted Use SCOs is still

present at the base of the excavation after removal of all soil required for construction of the new building's cellar level is complete, additional excavation would be performed to ensure complete removal of soil that does not meet Track 1 Unrestricted Use SCOs.

- No Engineering or Institutional Controls are required for a Track 1 cleanup, but a vapor barrier would be installed beneath the new building foundation and being foundation sidewalls as part of development to prevent any potential future exposures from off-Site soil vapor.
- As part of new development, placement of a final cover over the entire Site.

- Alternative 2 involves:
  - Establishment of Site Specific (Track 4) SCOs.
  - Removal of all soil/fill exceeding Track 4 Site-Specific SCOs and confirmation that Track 4 Site-Specific SCOs have been achieved with post-excavation confirmation sampling. Based on the results of the Remedial Investigation, it is expected that the SCOs would be achieved by excavating the top 2 feet of the Site. As part of development, excavation for the cellar level would take place to a depth of approximately 10 feet across 25% of the Site with the remainder of the Site being excavated 2 feet for the building slab and slab-on-grade portion of the development. If soil/ fill containing analytes at concentrations above Track 4 Site-Specific SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building is complete, additional excavation will be performed to meet Track 4 Site-Specific SCOs.
  - Placement of a final composite cover over the entire site to prevent exposure to remaining soil/fill.
  - Installation of a soil vapor barrier beneath the new building slab and along foundation sidewalls to prevent any potential future exposures from soil vapor.
  - Establishment of use restrictions including prohibitions on the use of groundwater from the Site; prohibitions on 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 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.
- Continued registration as an E-Designated property to memorialize the remedial action and the Engineering and Institutional Controls required by this RAWP.

3.1 THRESHOLD CRITERIA

Protection of Public Health and the Environment

This criterion is an evaluation of the remedy's ability to protect public health and the environment, and an assessment of how risks posed through each existing or potential pathway of exposure are eliminated, reduced or controlled through removal, treatment, and implementation of Engineering Controls or Institutional Controls. Protection of public health and the environment must be achieved for all approved remedial actions.

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

Alternative 2 would achieve comparable protections of human health and the environment by excavation and removal of soil/fill at the Site and by ensuring that remaining soil/fill on-Site meets the Track 4 Site-Specific SCOs, as well as by placement of Institutional and Engineering controls, including a composite cover system. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. The vapor barrier along with the slab would mitigate any vapor from entering the building. Implementing Institutional Controls including a Site Management Plan and continuing the E-designation would ensure that the composite cover system remains intact and protective of public health. Establishment of Track 4 Site-Specific SCOs 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 is not anticipated during construction/ the remedial action. Potential use of groundwater for potable supply would be prevented as its use is prohibited by city laws and regulations. Potential future migration of soil vapors into the new building would be prevented by installing a vapor barrier below the building slab and continuing the vapor barrier around foundation walls.

3.2. BALANCING CRITERIA

Compliance with Standards, Criteria and Guidance (SCGs)

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

Alternative 1 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil to achieve Track 1 Unrestricted Use SCOs and Protection of Groundwater SCOs. 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 around foundation walls, as part of development.

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

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

Short-term effectiveness and impacts

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

Short-term impacts would be higher for Alternative 1 as additional soils would be required to achieve Track 1 Unrestricted Use SCOs. Both alternatives would result in short-term dust generation impacts associated with excavation, handling, load out of materials, and truck traffic. Short-term impacts are likely to be higher for the Alternative 1 due to excavation of greater amounts of historical fill material beyond the excavation depth proposed building slab. However, focused attention to means and methods during the remedial action during a Track 1 removal action, including community air monitoring and appropriate truck routing, would minimize or negate the overall impact of these activities.

An additional short-term adverse impact and risks to the community associated with both remedial alternatives is increased truck traffic. Approximately 290, 25-ton capacity truck trips would be necessary to transport fill and soil excavated during Site development. Truck traffic will be routed on the most direct course using major thoroughfares where possible and flaggers will be used to protect pedestrians at Site entrances and exits.

The potential adverse impacts to the community, workers and the environment for both alternatives will 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 short term effectiveness in protecting the surrounding community by decreasing the risk of contact with on-Site contaminants. Construction workers operating under appropriate management procedures and a Construction Health and Safety Plan (CHASP) would be protected from on-Site contaminants by wearing personal protective equipment 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 Engineering Controls.

Alternative 1 would achieve long-term effectiveness and permanence related to on-Site contamination by permanently removing all impacted soil/fill material above Track 1 Unrestricted Use SCOs and enabling unrestricted usage of the property. 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 entire 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 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 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 will permanently eliminate the toxicity, mobility, and volume of contaminants from on-site soil by removing all soil in excess of Track 1 Unrestricted Use SCOs.

Alternative 2 would remove most of the historic fill at the Site, and any remaining on-Site soil beneath the new building will meet Track 4 Site-Specific SCOs.

Alternative 1 could potentially eliminate a greater total mass of contaminants on Site. The removal of soil to 2 feet across the site and 10 feet in the area of the cellar level 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, administrative feasibility (e.g. obtaining permits for remedial activities), and availability of services and materials.

Both Alternative 1 and 2 are feasible and implementable. The techniques, materials and equipment to implement both Alternatives 1 and 2 are readily available and have been proven effective in remediating the contaminants present on the Site. They use standard materials and services 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 at the Site was found during the RI to extend to a depth of approximately 12 feet below ground surface. The footprint of the new building will require excavation to a depth of 10 feet bgs in 25 percent of the site and excavation to a depth of 2 feet across the remainder of the site. Therefore, initial costs associated with Alternative 1 would be significantly higher as it involves substantial removal of soil/fill and disposal across the Site. If additional soil/fill with analytes above Track 1 Unrestricted Use SCOs but below Track 4 Site-Specific SCOs remains after excavation for the new building, long-term costs for Alternative 2 would likely be higher than Alternative 1 based on implementation of a Site Management Plan as part of Alternative 2.

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

Community Acceptance

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

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 1**. 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 new 25-story mixed-use commercial and residential building with a cellar. 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 area immediately surrounding the Site consists of commercial buildings to the east, west, and south beyond which is the Harlem River. To the north of the Site is the Major Deegan Expressway. The proposed development would clean up the property and make it safer, create new employment opportunities, living space for affordable and supportive housing 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.

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 soil under either alternative. To the extent practicable, energy efficient building materials, appliances, and equipment will be utilized to complete the development. A complete list of green remedial activities considered as part of the NYC VCP is included in the Sustainability Statement, included as **Appendix 2**.

4.0 REMEDIAL ACTION

4.1 SUMMARY OF PREFERRED REMEDIAL ACTION

The preferred remedial action alternative is Alternative 2, the Track 4 remedial action. The preferred remedial action alternative achieves protection of public health and the environment for the intended use of the property. The preferred remedial action alternative will achieve all of the remedial action objectives established for the project and addresses applicable SCGs. The preferred remedial action alternative is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants. The preferred remedial action alternative is cost effective and implementable and uses standards methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan (CPP);
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds;
3. Establishment of Track 4 Site-Specific Soil Cleanup Objectives (SCOs);
4. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility. A Waste Characterization Report documenting sample procedures, location, analytical results shall be submitted to NYCOER prior to start of remedial action;
5. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas;
6. Excavation and removal of soil/fill exceeding Track 4 Site-Specific SCOs. For development purposes, the entire footprint of the Site will be excavated to a depth of approximately 2 feet below grade for construction of the building slab and approximately

10 feet in the area of the proposed cellar. The rear yard will be excavated 2 feet and capped with asphalt. An estimated 7,072 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 onsite;

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 underground storage tanks (USTs) 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 licensed or 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 onsite;

11. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs;

12. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations;

13. Construction of an engineered composite cover consisting of 6 inch thick concrete slab across the footprint of the new building and 6-inch thick asphalt cap in the rear yard area;

14. Installation of a vapor barrier system beneath the concrete building slab and outside of sub-grade foundation sidewalls to mitigate soil vapor migration into the building. The vapor waterproofing/barrier system will consist of 46-mil Grace Preprufe 300R waterproofing membrane by beneath the slab and will be extended up to grade level by attaching it to the exterior sides of foundation walls using Grace 32-mil Preprufe 160R waterproofing membrane;

15. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations;

16. Performance of all activities required for the remedial action, including acquisition of required permits requirements and attainment of pretreatment requirements, in compliance with applicable laws and regulations;

17. Submission of a Remedial action report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP;

18. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency; and

19. 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.

4.2 SOIL CLEANUP OBJECTIVES AND SOIL/FILL MANAGEMENT

The following Track 4 Site-Specific SCOs will be utilized for this project:

Contaminant	**Track 4 SCOs**
Total SVOCs	120 ppm
Barium	700 ppm
Lead	750 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 3**. Soil and fill management at the Site will include impacted soil removal and disposal within the development cut. The location of planned excavations is shown in **Figure 6**.

Soil/Fill Excavation and Removal

2 feet will be excavated across the Site for the slab on grade portion of the new building and open space with 10 feet being excavated in areas of the proposed cellar. The location of planned excavations is shown in **Figure 6**. The total quantity of soil/fill expected to be excavated and disposed off-Site is 7,072.66 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.

Confirmation End-point Sampling

Removal actions for development purposes under this plan will be performed in conjunction with 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 4 Site-Specific SCOs, six post-excavation confirmation soil samples will be collected and analyzed for SVOCs according to the analytical methods described above. The approximate collection location of the endpoint soil samples is shown on **Figure 7**.

Hotspot End-Point Sampling

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.

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.

One blind duplicate sample for every 20 samples collected will be submitted to the approved laboratory for analysis of the same parameters. Trip blanks will be used whenever samples are transported to the laboratory for analysis of VOCs. One trip blank will be submitted to the laboratory with each shipment of soil samples. Trip blanks will not be used for samples to be analyzed for metals, SVOCs or pesticides.

Field QA/QC will include the following procedures:

- Calibration of field equipment, including PID, on a daily basis;
- Use of dedicated and/or disposable field sampling equipment;
- Proper sample handling and preservation;
- Proper sample chain of custody documentation; and
- Completion of report logs.

The above procedures will be executed as follows:

- Dedicated disposable sampling equipment will be used to minimize cross-contamination between samples;

- For each of the parameters analyzed, a sufficient sample volume will be collected to adhere to the specific analytical protocol, and provide sufficient sample for reanalysis if necessary;
- Because plasticizers and other organic compounds inherent in plastic containers may contaminate samples requiring organic analysis, samples will be collected in glass containers;
- Appropriate sample preservation techniques, including cold temperature storage at 4º C, will be utilized to ensure that the analytical parameters concentrations do not change between the time of sample collection and analysis; and
- Samples will be analyzed prior to the expiration of the respective holding time for each analytical parameter to ensure the integrity of the analytical results.

Import of Soils

Import of soils onto the property will be performed in conformance with the Soil/Materials Management Plan in **Appendix 3**. At this time, it is estimated that no material will be required for backfill. If any material is required, the OER will be notified if any backfill material allocation will be coordinated.

Reuse of Onsite Soils

Soil reuse is not planned on this project.

4.3 ENGINEERING CONTROLS

The excavation required for the proposed Site development will achieve Track 4 Site-Specific SCOs. The following features will be incorporated into the foundation design: composite cover system consisting of a 6-inch thick concrete slab and asphalt open area and a soil vapor barrier. These 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. The entire property will be covered by an engineered permanent cover system comprised of:

- Structural 6-inch concrete slab foundation beneath the proposed building footprint
- Asphalt cover in the open areas

The composite cover system is 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. A typical design and locations for each remedial cover type used on this Site will be provided in a Stipulation List.

Vapor Barrier

Migration of soil vapor from onsite or offsite sources into the building in the future will be mitigated with a combination of building slab and a vapor barrier system. A waterproofing/ vapor barrier system will be installed beneath the cellar of the new building and will consist of a 46-mil Grace Preprufe 300R waterproofing membrane. The vapor barrier will be extended up to grade level by attaching it to the exterior sides of foundation walls using 32-mil Grace Preprufe 160R waterproofing membrane. The specifications for installation will be provided to the construction management company and the foundation contractor or installer of the liner. The specifications state that all vapor barrier seams, penetrations, and repairs will be sealed either by the tape method or weld method, according to the manufacturer's recommendations and instructions

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 will be provided in a Stipulation List. Product specification sheets are provided in **Appendix 5**.

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 series of Institutional Controls (IC) are required under this remedial action to assure permanent protection of public health by elimination of exposure to residual materials. 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 for this remedial action are:

- 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 Site Management Plan which will note that the property owner and property owner's successors and assigns must comply with the approved SMP;
- Submittal of a Site Management Plan in the RAR for approval by OER that provides procedures for appropriate operation, maintenance, monitoring, inspection, reporting and certification of ECs and ICs. 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 on a annual basis 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; and
- The Site will be used for commercial and residential use and will not be used for a higher level of use without prior approval by OER.

4.5 SITE MANAGEMENT PLAN

Site Management is the last phase of remediation and begins with the approval of the Remedial Action Report and issuance of the Notice of Completion (NOC) for the Remedial Action. The Site Management Plan (SMP) describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by this RAWP. The Site Management Plan is submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER. The property owner is responsible to ensure that all Site Management responsibilities defined in 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 and IC's.

Site management activities and EC/IC certification will be scheduled by OER on a periodic basis to be established in the RAR and 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.

Data and information 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 under current and future conditions 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 Remedial Investigation Report, historic fill was encountered at the Site to a depth of approximately 12 feet. The following contaminants of concern were detected within the historic fill:

Soil

- SVOCs including PAHs benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and dibenzo(a,h)anthracene exceeding Restricted Residential Use SCOs;
- Metals including barium and lead exceeding Restricted Use SCOs; and
- Pesticides and PCBs were identified, but did not exceed Restricted Residential Use SCOs.

Groundwater

- VOCs including 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, acetone, napthalene and n-Butylbenzene exceeding their respective GQS;
- SVOC phenol exceeding its GQS; and
- Metals including antimony, lead, magnesium, manganese, sodium and selenium exceeding GQS.

Soil Vapor

- Low levels of chlorinated VOCs detected with PCE detected above NYS DOH Soil Vapor Matrix; and
- Moderate levels of petroleum-related VOCs including benzene, toluene, ethyl-benzene and xylene.

Nature, Extent, Fate and Transport of Contaminants

The information compiled during previous investigations has confirmed the presence of contaminated fill material from surface grade to an approximate depth of 12 feet bgs. SVOCs and metals are present in the historic fill materials throughout the Site at shallow depths. The VOCs that were identified in soil gas at low to moderate concentrations were not found in on-Site soil at appreciable concentrations and reflect off-site sources. Petroleum related VOCs and metals are present in the groundwater beneath the site.

Receptor Populations

The immediate area is mixed use residential, manufacturing, industrial and commercial and is anticipated to remain as such. The new building at the site will be utilized as a mixed-use residential and commercial. Potential receptor populations are as follows:

On-Site Receptors - The Site is currently vacant and capped. Therefore, the only potential on-Site receptors are Site owners, operators, workers, clients granted access to the property and trespassers. During construction, the on-Site potential receptors will include construction workers, site representatives, and visitors. Under proposed future conditions, the on-Site potential sensitive receptors will include adult and child building residents, workers and visitors.

Off-Site Receptors - Potential offsite receptors within a 500-foot radius of the Site include: adult and child residents, commercial, industrial 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. Light Industrial – existing and future
3. Residential Buildings – existing and future
4. Building Construction/Renovation – existing and future
5. Pedestrians, Trespassers, Cyclists – existing and future
6. Schools – existing and future

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

Potential Points of Exposure

Current Conditions – 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. Access to the property includes owner representatives, patrons and employees. Groundwater is not accessible at the Site, and because the Site is served by the public water supply and groundwater use for potable supply is prohibited so there is no potential for exposure. Therefore, there are currently no complete exposure pathways to surficial soil/fill material or

groundwater. Based upon data collected from the RI, soil vapor is accumulating beneath the current asphalt covered lot.

Construction/Remediation Activities – During the remedial action, construction workers will come into direct contact with surface and subsurface soils as a result of on-Site construction/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 onsite activities. Due to the depth of groundwater, direct contact with groundwater may occur. During construction, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through dust controls, and through the implementation of the Community Air Monitoring Plan and a Construction Health and Safety Plan. Groundwater is not anticipated to be encountered during the construction of the cellar.

Proposed Future Conditions – Under future remediated conditions, all soil in excess of Track 4 Site-Specific SCOs will be removed. The site will be fully capped, limiting potential direct exposure to soil and groundwater remaining in place, and engineering controls (vapor barrier system) will prevent any potential exposure due to inhalation by preventing soil vapor intrusion. The Site is served by a public water supply, and groundwater is not used at the Site for potable supply. There are no plausible off-site pathways for ingestion, inhalation, or dermal exposure to contaminants derived from the Site under future conditions.

Overall Human Health Exposure Assessment

There are 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 residential structure, site-wide surface cover, and a subsurface vapor barrier. 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.

5.0 REMEDIAL ACTION MANAGEMENT

5.1 PROJECT ORGANIZATION AND OVERSIGHT

Principal personnel who will participate in the remedial action include Erica Johnston, Project Manager and Rachel Ataman, Vice President of Technical Services. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Shaik A. Saad and Mark E. Robbins, respectively.

5.2 SITE SECURITY

The Applicant will control site access of the fenced property through gated entrances. Barriers 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 7.00 AM to 5:00 PM. 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 4**. The Site Safety Coordinator will be Erica Johnston. Remedial work performed under this RAWP will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the remedial construction work will ensure that performance of work is in compliance with the HASP and applicable laws and regulations. The HASP pertains to remedial and invasive work performed at the Site until the issuance of the Notice of Completion.

All field personnel involved in remedial activities will participate in training required under 29 CFR 1910.120, including 40-hour hazardous waste operator training and annual 8-hour

refresher training. Site Safety Officer will be responsible for maintaining workers training records.

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

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

5.5 COMMUNITY AIR MONITORING PLAN

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

Periodic monitoring for VOCs will be performed during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence. 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.

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

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

Dewatering

Due to the depth of groundwater, dewatering is not anticipated to be necessary. 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.

Equipment and Material Staging

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

Stabilized Construction Entrance

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

Truck Inspection Station

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

Extreme Storm Preparedness and Response Contingency Plan

Damage from flooding or storm surge can include dislocation of soil and stockpiled materials, dislocation of site structures and construction materials and equipment, and dislocation

of support of excavation structures. Damage from wind during an extreme storm event can create unsafe or unstable structures, damage safety structures and cause downed power lines creating dangerous site conditions and loss of power. In the event of emergency conditions caused by an extreme storm event, Chess Builders, 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; storm water management systems will be inspected and fortified, including, as necessary: clean and reposition silt fences, hay bales; clean storm sewer filters and traps; and secure and protect pumps and hosing.

Storm Response

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to OER at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to public safety authorities via appropriate means such as calling 911. Petroleum spills will be reported to NYS DEC within 2 hours of identification and consistent with State regulations. Emergency and spill conditions will also be reported to OER. Public safety structures, such as construction security fences will be repaired promptly to eliminate public safety threats. Debris will be collected and removed. Dewatering will be performed in compliance with existing laws and regulations and consistent with emergency

notifications, if any, from proper authorities. Eroded areas of soil including unsafe slopes will be stabilized and fortified. Dislocated materials will be collected and appropriately managed. Support of excavation structure will be inspected and fortified as necessary. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. Storm-water control systems and structures will be inspected and maintained as necessary. If soil or fill materials are discharged off site to adjacent properties, property owners and OER will be notified and corrective measure plan designed to remove and clean dislocated material will be submitted to OER and implemented following approval by OER and granting of site access by the property owner. Impacted offsite areas may require characterization based on site conditions, at the discretion of OER. If onsite petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYS DEC's spill hotline at DEC 800-457-7362. If the source of the spill is ongoing and can be identified, it should be stopped 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 NYC VCP Site with soil/fill will be instructed to proceed without stopping in the vicinity of the site to prevent neighborhood impacts. The planned route on local roads for trucks leaving the site is presented in **Figure 5.**

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.

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;
- 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 or fill material removed from the Site including a map showing the location of these excavations and hotspots, tanks or other contaminant source areas;
- 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;
- 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.

Remedial Action Report Certification

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

I, Shaik A. Saad, 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 200 East 135th Street site, site number [VCP site number]. 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 200 East 135th Street site, site number [VCP site number]. 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

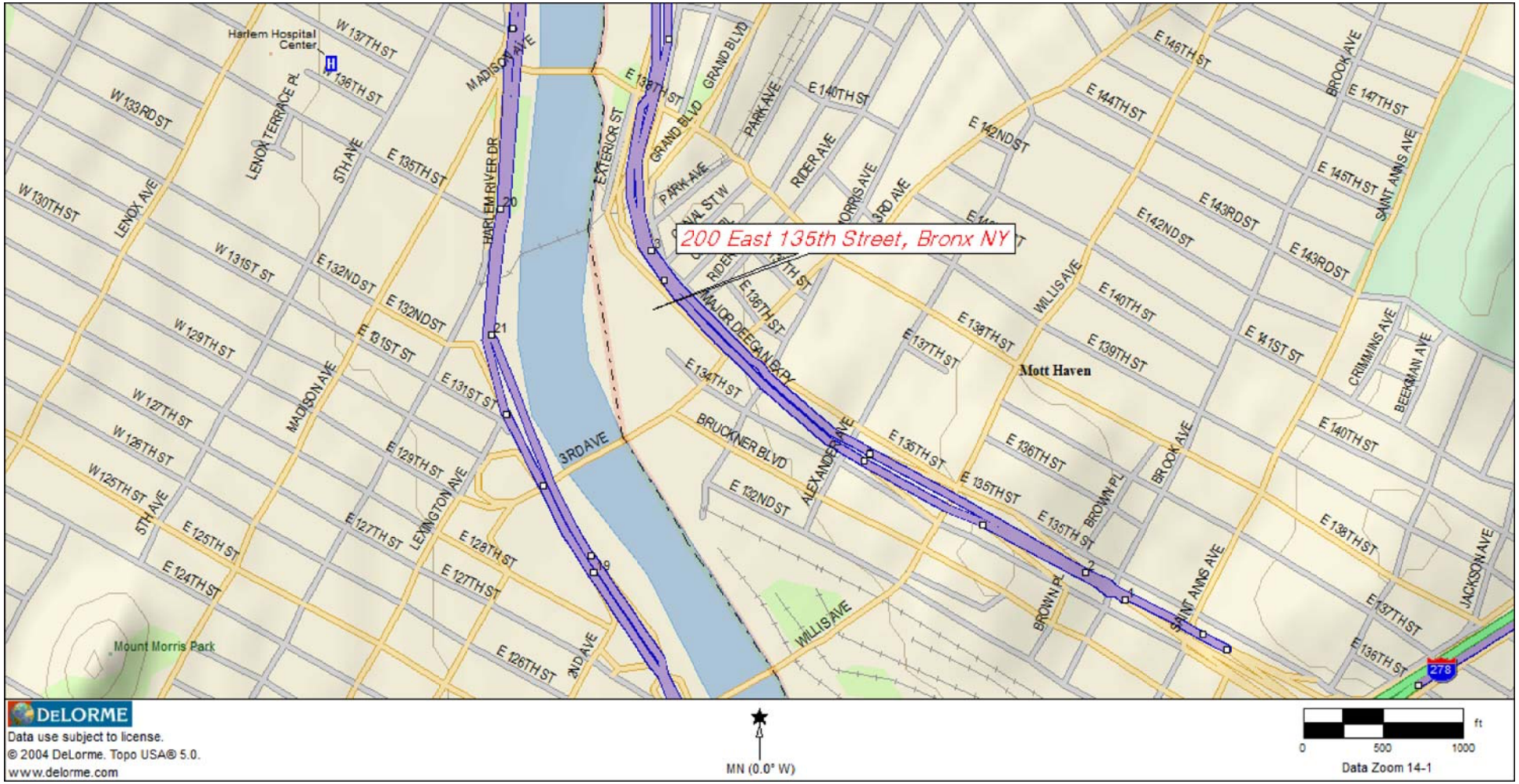
Date

7.0 SCHEDULE

The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER. Currently, a 24-month remediation period is anticipated.

Schedule Milestone	Weeks from Remedial Action Start	Duration (weeks)
OER Approval of RAWP	0	-
Fact Sheet 2 announcing start of remedy	0	-
Mobilization	2	1
Remedial Excavation	5	3
Demobilization	24	2
Submit Remedial Action Report	35	2

FIGURES



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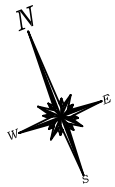
www.hydrotechenvironmental.com

200 East 135th Street
Bronx, NY.
HTE Job # 150133

Drawn By: C.Q.
Reviewed By: M.R
Approved By: M.R
Date: 07/20/15
Scale: AS NOTED

TITLE:

FIGURE 1: SITE LOCATION MAP



ADJACENT
MAJOR DEEGAN EXPRESSWAY

EAST 135th STREET

SIDEWALK

ADJACENT 4-STORY
COMMERCIAL

ADJACENT 5-STORY
RESIDENTIAL

PROPERTY
OUTLINE

ADJACENT 4-STORY
COMMERCIAL

0' 20' 40' 60'

SCALE IN FEET (FT.)

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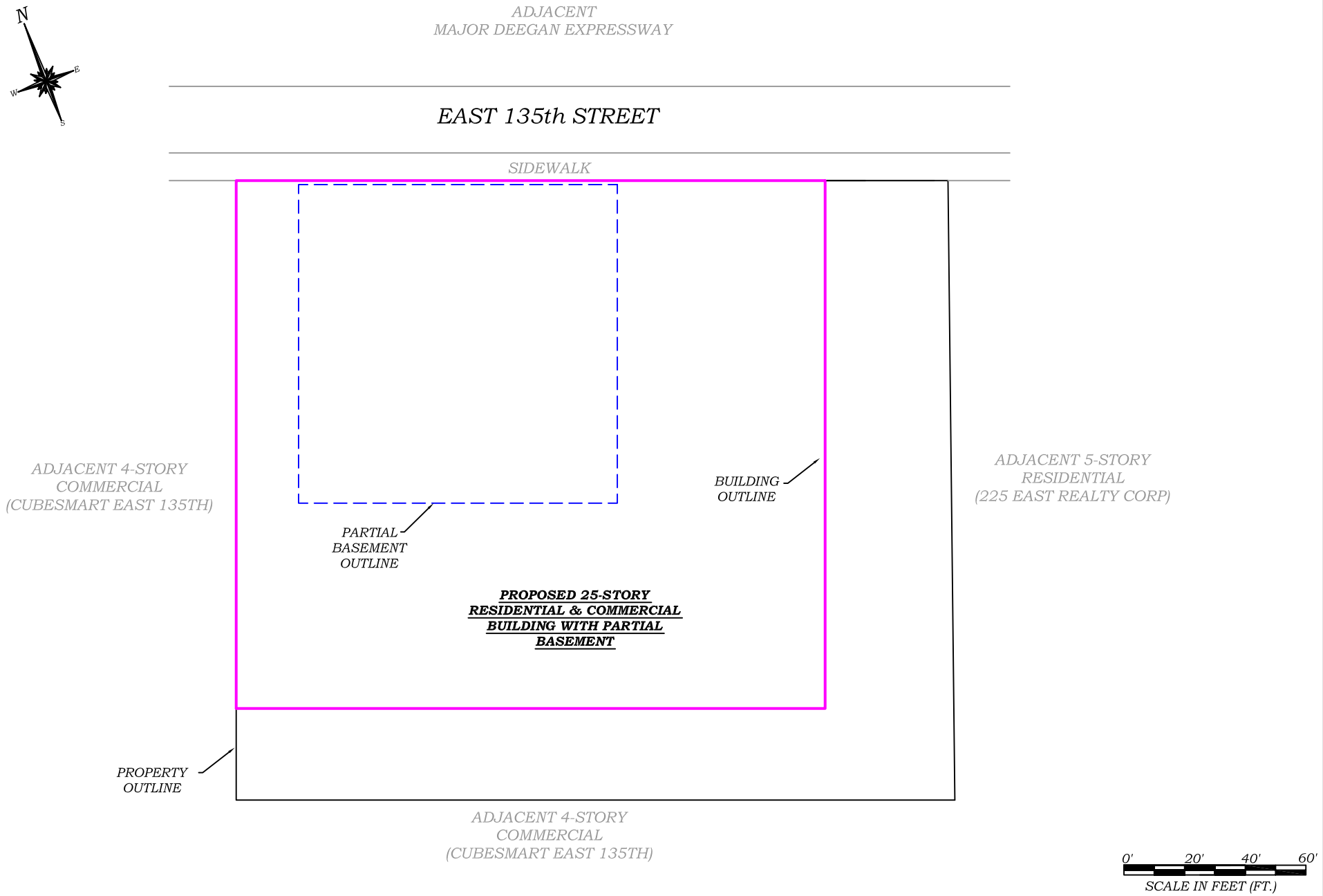
FIGURE 2: SITE BOUNDARY MAP



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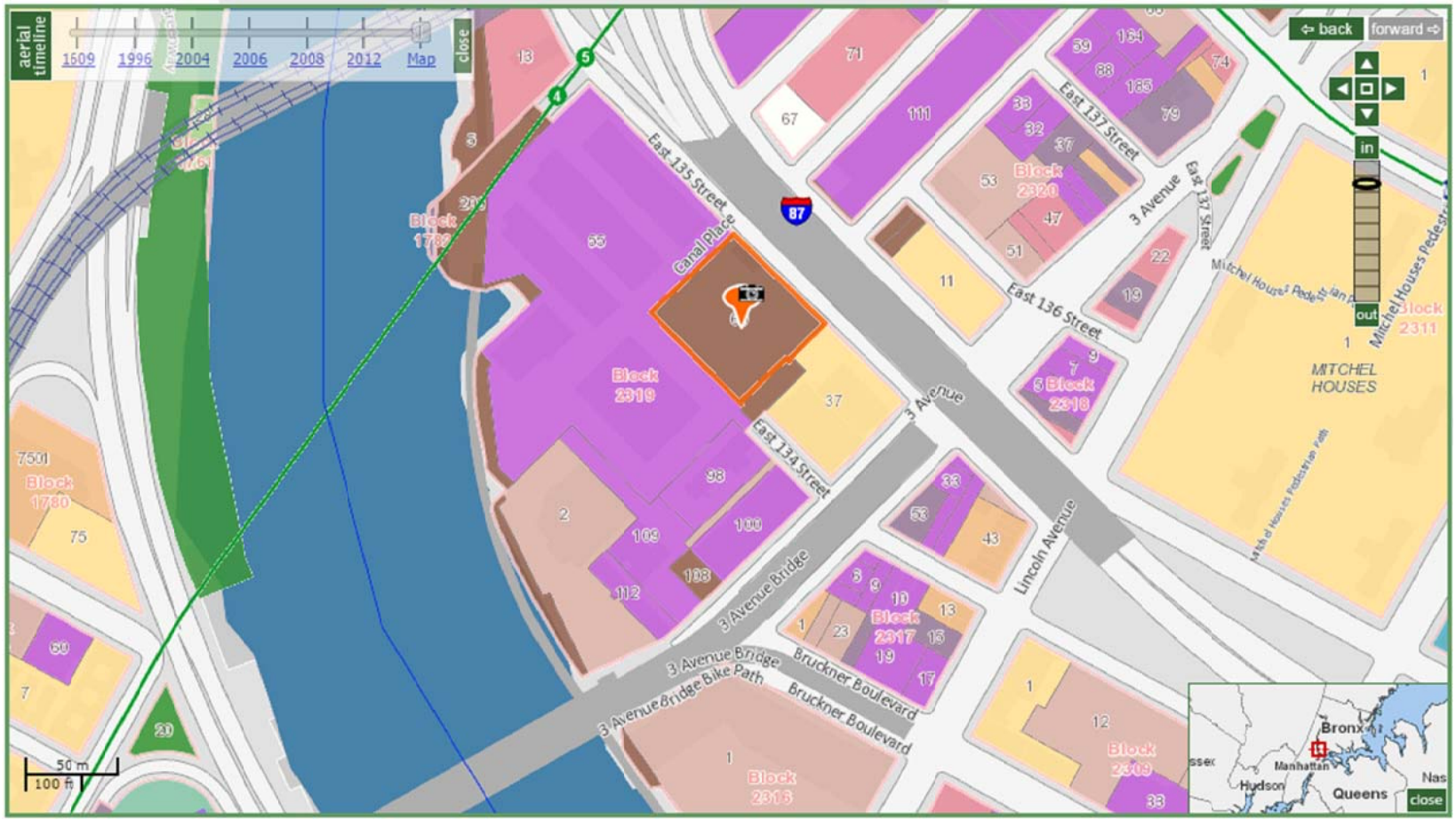
TITLE:

FIGURE 3: PROPOSED DEVELOPMENT PLAN



Land Use

All land use categories

2003 2005 2007 2009 2014

- 1 & 2 Family Residential
- Multi-family Residential
- Mixed Use
- Open space & outdoor recreation
- Commercial
- Institutions
- Industrial
- Parking
- Transportation / Utilities
- Vacant Lots

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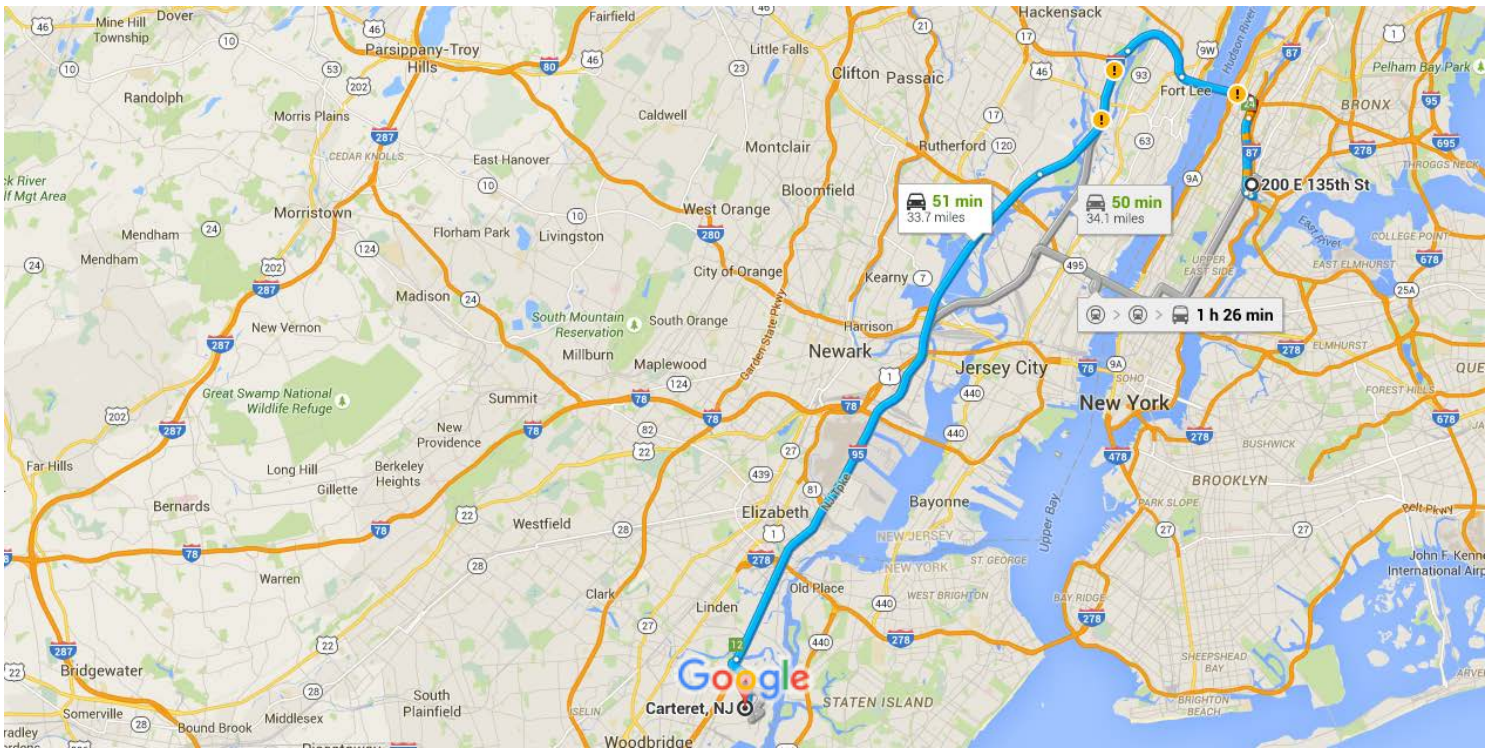
TITLE:

FIGURE 4: LAND USE MAP

200 E 135th St, Bronx, NY 10451 to Carteret, NJ

Drive 33.7 miles, 51 min



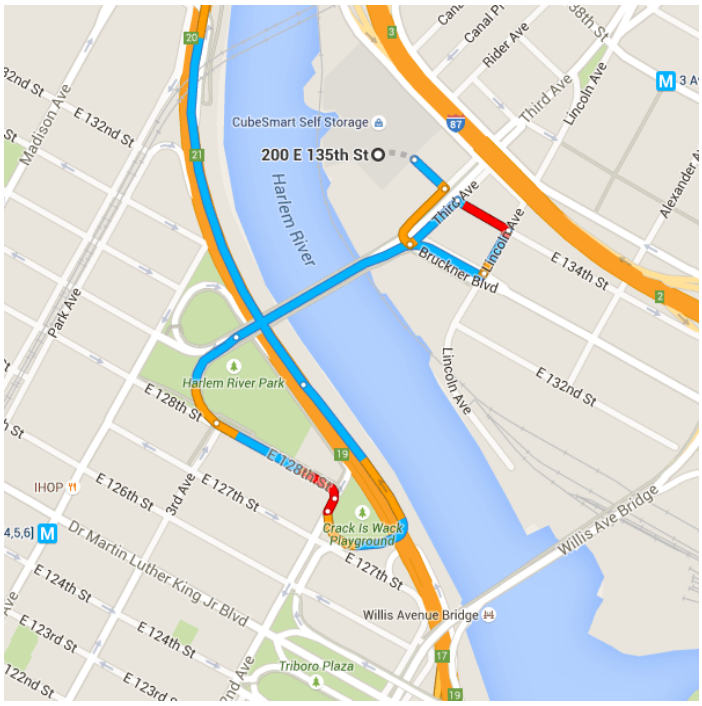
200 E 135th St

Bronx, NY 10451

Get on Harlem River Dr in Manhattan from Third Ave, 3rd Ave Bridge and E 128th St

5 min (1.1 mi)

1. Head southeast on E 134th St toward Third Ave — 217 ft
2. Turn right onto Third Ave — 390 ft
3. Turn left to stay on Third Ave — 335 ft
4. Turn right onto E 134th St — 299 ft
5. Turn right at the 1st cross street onto Lincoln Ave — 249 ft
6. Turn right onto 3rd Ave Bridge — 0.3 mi



7. Use the left 2 lanes to turn slightly left to stay on 3rd Ave Bridge

0.1 mi

8. Use any lane to turn slightly left onto E 128th St

0.1 mi

9. E 128th St turns slightly right and becomes 2nd Ave

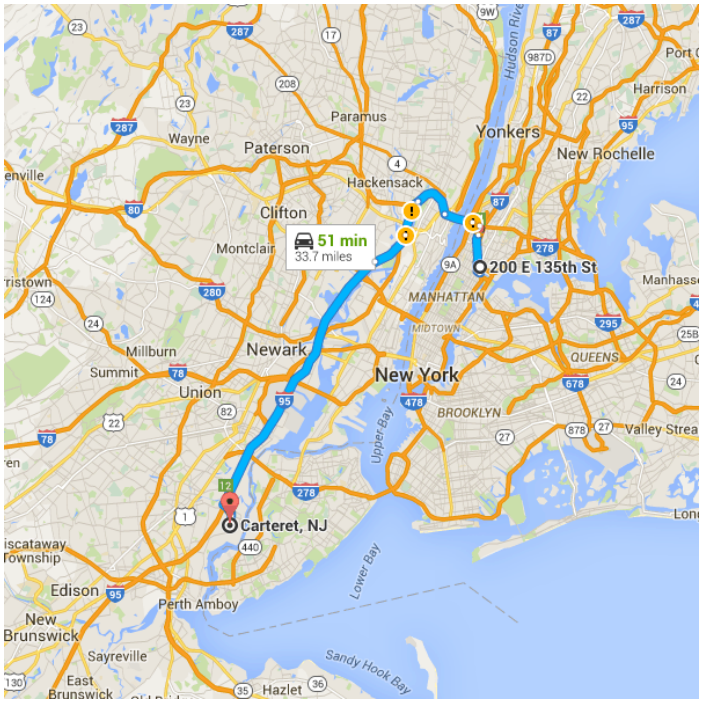
72 ft

10. Use the left lane to merge onto Harlem River Dr via the ramp to Uptown

0.3 mi

Take I-95 to Roosevelt Ave in Carteret. Take exit 12 from I-95 S

37 min (31.5 mi)



11. Merge onto Harlem River Dr

2.3 mi

12. Use the left 2 lanes to take exit 24 for I-95 S/Geo Washington Bridge

0.6 mi

13. Keep right at the fork, follow signs for Henry Hudson Parkway/George Washington Bridge Lower Level and merge onto Interstate 95 Lower Level S/Trans-Manhattan Expy/U.S. 1 Lower Level S

0.4 mi

14. Keep left to continue on George Washington Bridge/Interstate 95 Lower Level S/U.S. 1 Lower Level S, follow signs for Interstate 95 S/New Jersey

Entering New Jersey

1.8 mi

15. Continue onto I-95

Partial toll road

2.7 mi

16. Keep left at the fork to continue on I-95 S, follow signs for Interstate 95 S/New Jersey Turnpike S/US 46/Newark

Partial toll road

2.4 mi

17. Keep left at the fork to stay on I-95 S, follow signs for New Jersey Turnpike S/Interstate 95 S/16W
⚠ Toll road

2.6 mi

18. Keep left at the fork to stay on I-95 S, follow signs for Express EZPass
⚠ Toll road

17.9 mi

19. Take exit 12 toward Carteret Rahway
⚠ Toll road

0.6 mi

20. Keep right at the fork, follow signs for West Carteret/Rahway
⚠ Toll road

266 ft

21. Keep left at the fork to continue toward Roosevelt Ave

436 ft

Continue on Roosevelt Ave. Take Washington Ave to Carteret Ave

4 min (1.1 mi)

22. Turn left onto Roosevelt Ave

0.4 mi

23. Continue straight onto Washington Ave

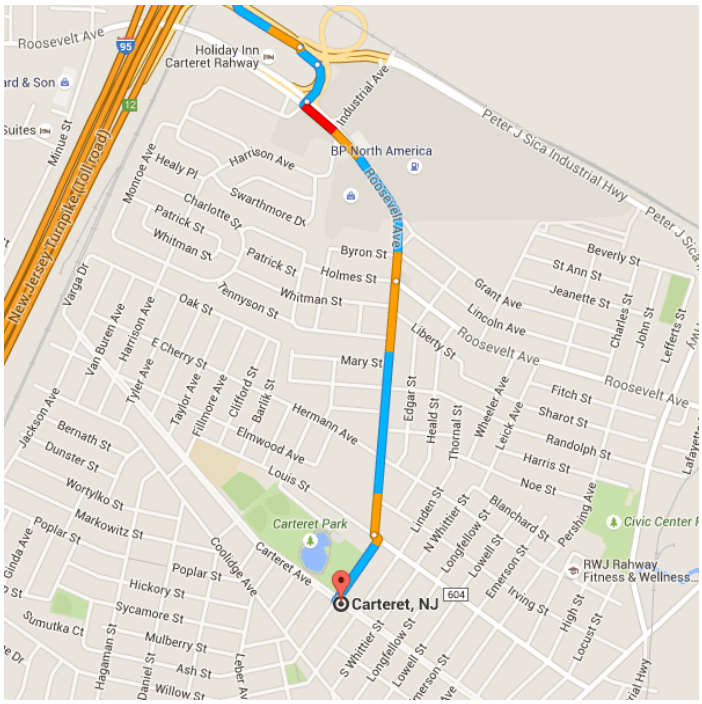
0.5 mi

24. Slight right onto Cypress St

0.1 mi

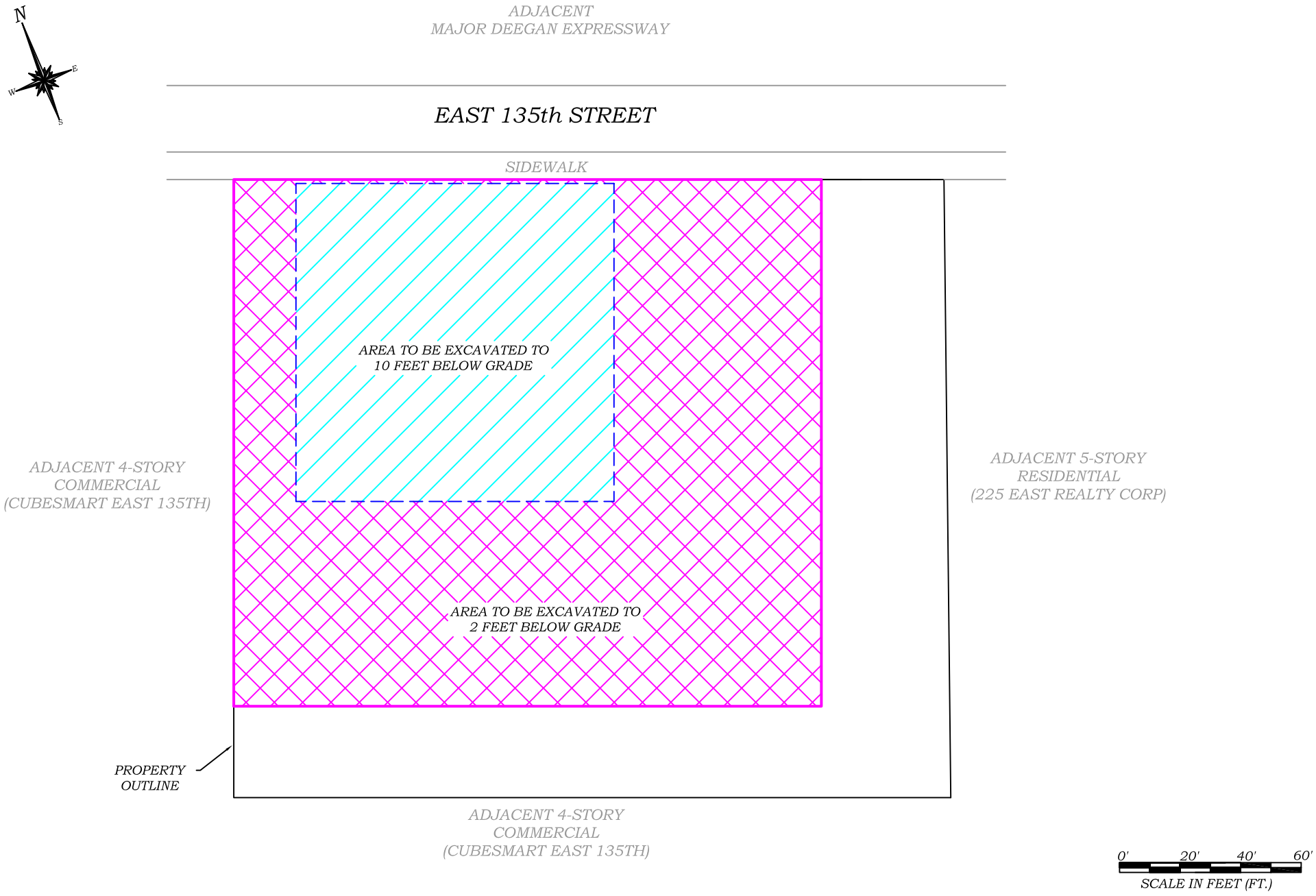
25. Turn left onto Carteret Ave

98 ft



Carteret, NJ

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.



HYDRO TECH ENVIRONMENTAL CORP.

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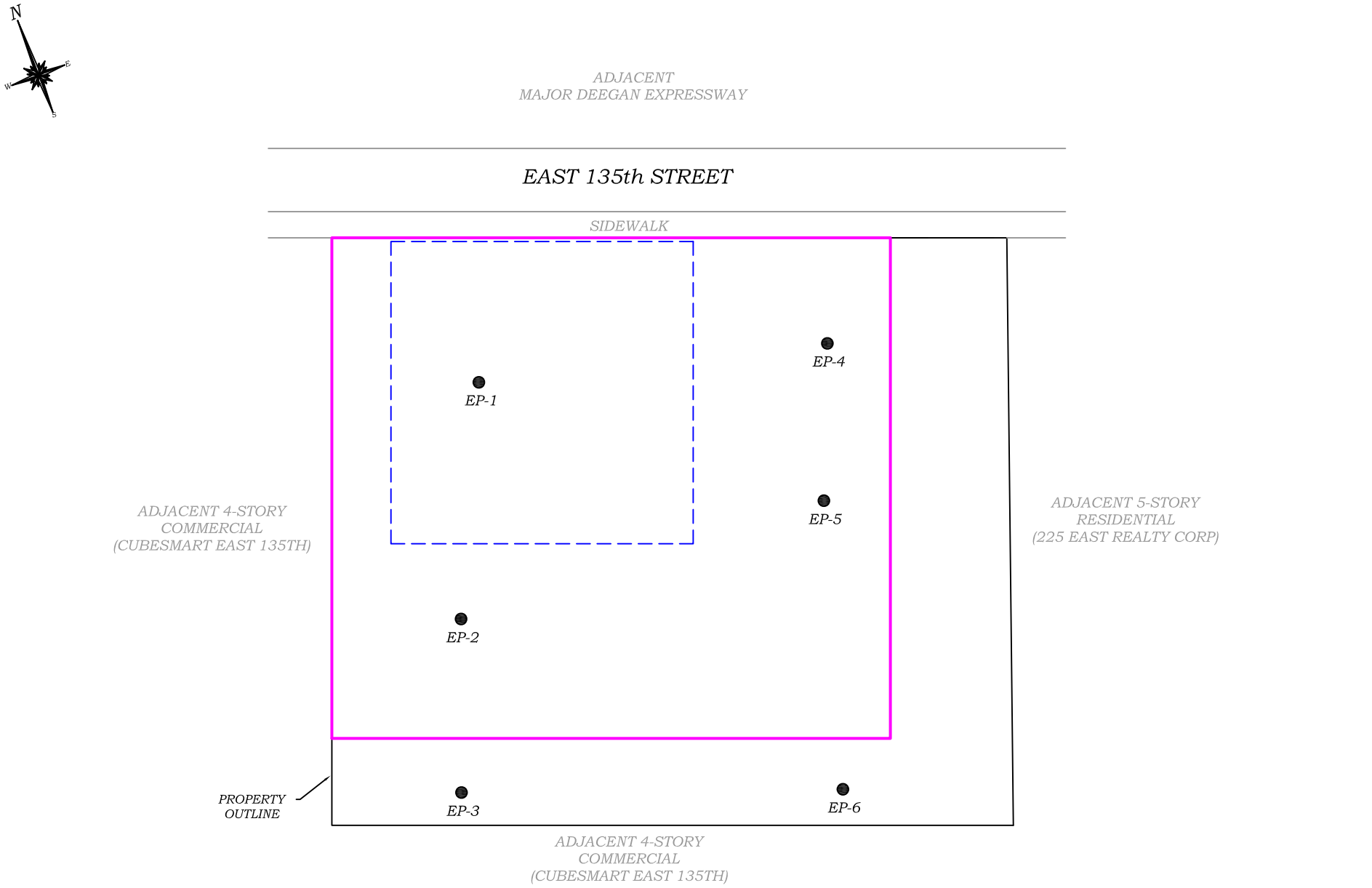
www.hydrotechenvironmental.com

200 East 135th Street
Bronx, NY.
HTE Job # 150133

Drawn By:	C.Q.
Reviewed By:	M.V
Approved By:	M.R
Date:	09/20/15
Scale:	AS NOTED

TITLE:

FIGURE 6: PROPOSED EXCAVATION PLAN



LEGEND:

● PROPOSED END POINT SAMPLING PLAN (EP)

0' 20' 40' 60'

SCALE IN FEET (FT.)

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TITLE:

FIGURE 7: ENDPOINT SAMPLING PLAN

APPENDIX 1

CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Chess Builders 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, Chess Builders 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. Chess Builders LLC will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

New York Public Library – Mott Haven Library

321 East 140th Street

Bronx, New York 10454

(718) 665-4878

Monday and Thursday: 10:00 AM to 6:00 PM

Tuesday and Wednesday: 10:00 PM to 7:00 PM

Friday and Saturday: 10:00 AM to 5:00 PM

Sunday: Closed

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

Identify Issues of Public Concern. The major issues of concern to the public will be potential impacts of nuisance odors and dust during the disturbance of soil at the Site. This work will be performed in accordance with procedures that will be specified under a Remedial Program and considers and takes preventive measures for exposure to future residents of the property and those on adjacent properties during construction. Detailed plans to monitor the potential for exposure including a CHASP and a CAMP are required components of the remedial program. Implementation of these plans will be under the direct oversight of the NYCOER.

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

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

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

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

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

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

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

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

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

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

  Public notice in the form of a fact sheet is sent to all parties listed on the site contact list announcing the completion of remediation, providing a list of all institutional and engineering controls implemented for to the site and announcing the issuance of the Notice of Completion.

APPENDIX 2
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 Brownfield Cleanup Program. Chess Builders LLC is participating in OER's Paperless Voluntary Cleanup Program. Under this program, submission of electronic documents will replace submission of hard copies for the review of project documents, communications and milestone reports.

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

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

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

APPENDIX 3

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 final signoff by OER.

1.2 STOCKPILE METHODS

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

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

1.3 CHARACTERIZATION OF EXCAVATED MATERIALS

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

1.4 MATERIALS EXCAVATION, LOAD-OUT AND DEPARTURE

The PE/QEP overseeing the remedial action will:

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

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

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

1.5 OFF-SITE MATERIALS TRANSPORT

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

Outbound truck transport routes are included as **Figure 5**. 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 Chess Builders, 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 Brooklyn, New York under a governmental remediation program. The letter will provide the project identity and the name and phone number of the PE/QEP or Chess Builders, 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.

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

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

Waste characterization will be performed for off-Site disposal in a manner required by the receiving facility and in conformance with its applicable permits. Waste characterization

sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the RAR. A manifest system for off-Site transportation of exported materials will be employed. Manifest information will be reported in the RAR. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable laws and regulations.

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

1.7 MATERIALS REUSE ON-SITE

Soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan may be reused on-Site. The soil cleanup objectives for on-Site reuse are Track 4 Site Specific SCOs. '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. The expected location for placement of reused material will be provided in the RAR.

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

1.8 DEMARCATION

After completion of hotspot removal and any other invasive remedial activities, and prior to backfilling, the top of the residual soil/fill will be defined by one of three methods: (1) placement

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

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

1.9 IMPORT OF BACKFILL SOIL FROM OFF-SITE SOURCES

This Section presents the requirements for imported fill materials to be used below the cover layer and within the clean soil cover layer. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. The backfill and cover soil quality objectives are Track 4 Site Specific SCOs.

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

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

- Clean soil from construction projects at non-industrial sites in compliance with applicable laws and regulations;
- Clean soil from roadway or other transportation-related projects in compliance with applicable laws and regulations;

- Clean recycled concrete aggregate (RCA) from facilities permitted or registered by the regulations of NYS DEC.

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

Source Screening and Testing

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

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

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

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

1.10 FLUIDS MANAGEMENT

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

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

1.11 STORM-WATER POLLUTION PREVENTION

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

1.12 CONTINGENCY PLAN

This contingency plan is developed for the remedial construction to address the discovery of unknown structures or contaminated media during excavation. Identification of unknown contamination source areas during invasive Site work will be promptly communicated to OER's Project Manager. Petroleum spills will be reported to the NYS DEC Spill Hotline. These findings will be included in the daily report. If previously unidentified contaminant sources are found during on-Site remedial excavation or development-related excavation, sampling will be performed on contaminated source material and surrounding soils and reported to OER. Chemical analytical testing will be performed for TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

1.13 ODOR, DUST AND NUISANCE CONTROL

Odor Control

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

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

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 this remedial plan.

Other Nuisances

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

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

APPENDIX 4

HEALTH AND SAFETY PLAN

CONSTRUCTION HEALTH & SAFETY PLAN

200 East 135th Street
E- 143; Block 2319 and Lot 60
Bronx, New York

OER Project Number: 13EHAN270X

Table of Contents

Figures
1. Directions to Hospital

Attachments
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 200 East 135th Street (Block 2319 and Lot 60) and situated in the borough of Bronx, 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 25-story mixed use residential building with a basement.

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. Prior environmental assessments identified Semi-Volatile Organic Compounds (SVOCs), Pesticides/PCBs and Metals including lead in soil/fill beneath the Site at concentrations exceeding their respective Unrestricted Use Soil Cleanup Objectives (SCOs). A range of vapors associated with chlorinated solvents and petroleum constituents were also detected beneath 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 vapor barrier

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
Lincoln Medical and Mental Health Center	718-579-5016
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
Geologist	Rachel Ataman	(631) 462-5866	(631) 457-0032
Site Safety Officer	Morgan Violette	(718) 636-0800	(631) 406-3711
Project Manager	Morgan Violette	(718) 636-0800	(631) 406-3711

Directions to Lincoln Medical and Mental Health Center (see attached Figure 1)

1. Take Third Avenue to East 135th Street.
2. Turn left onto East 135th Street.
3. Continue onto Park Avenue.
4. Turn right onto East 149th Street.
5. Destination will be ahead 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 the recent subsurface investigation:

Volatile Organic Compounds in the soil:
- Acetone

Semi Volatile Organic Compounds in the soil:
- Benzo(a)anthracene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Chrysene
- Indeno(1,2,3-cd)pyrene

Pesticides/PCBs in the soil:
- 4,4'-DDD
- 4,4'-DDE
- 4,4'-DDT
- Total PCBs

Heavy Metals in soil:
- Barium
- Copper

- Lead
- Manganese
- Mercury
- Selenium
- Zinc

Volatile Organic Compounds in the groundwater:

- 1,2,4-Trimethylbenzene
- 1,2-Dichlorobenzene
- Acetone
- Methylene Chloride
- Napthalene
- N-Butylbenzene

Semi Volatile Organic Compounds in groundwater:

- Phenol

Metals in the groundwater:

- Antimony
- Chromium
- Lead
- Magnesium
- Manganese
- Selenium
- Sodium

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

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, or causing 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.

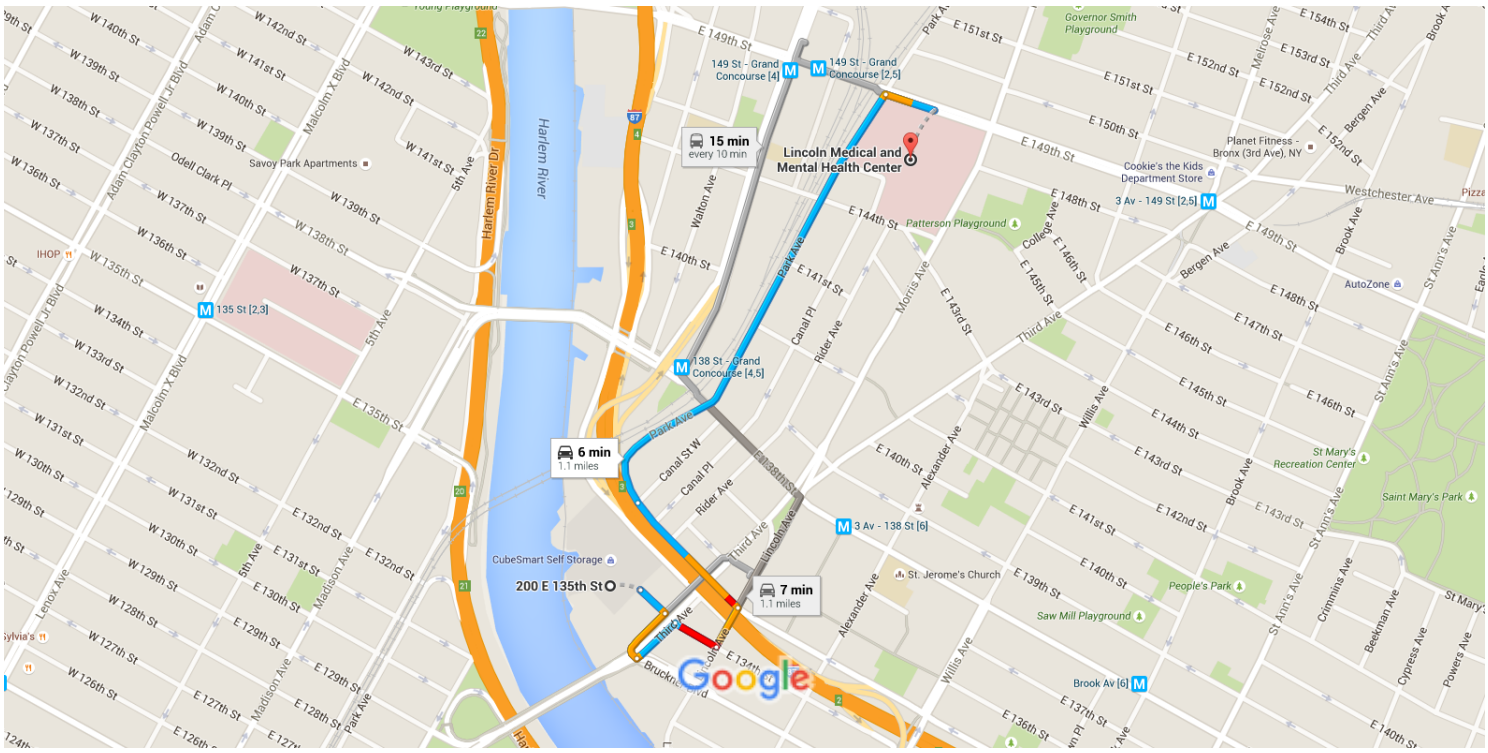
If a commercial/industrial laundry is used to clean or launder clothing that is potentially contaminated, they shall be informed of the potential harmful effects of exposure to hazardous substances related to the affected clothing.

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

200 E 135th St, Bronx, NY 10451 to Lincoln Medical and Mental Health Center

Drive 1.1 miles, 6 min



Map data ©2015 Google 500 ft

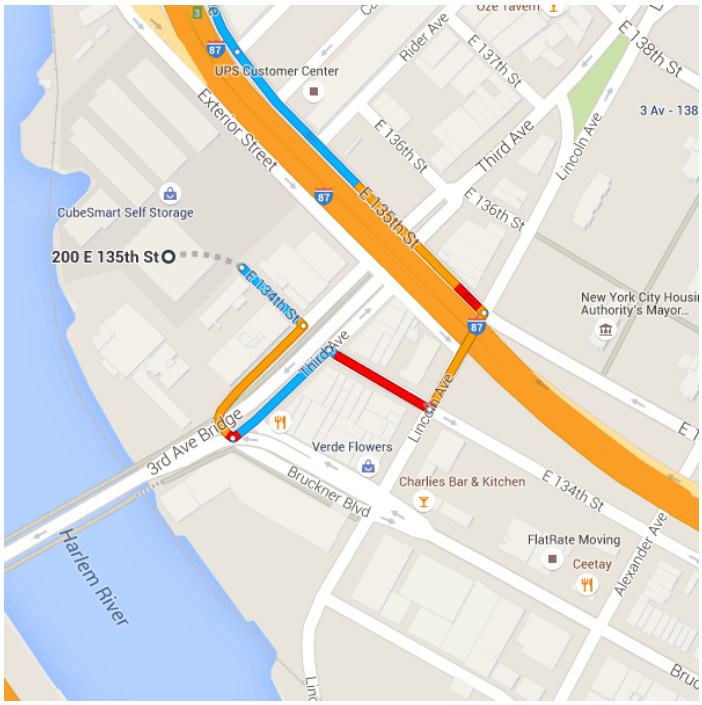
200 E 135th St

Bronx, NY 10451

Take Third Ave to E 135th St

2 min (0.3 mi)

1. Head southeast on E 134th St toward Third Ave — 217 ft
2. Turn right onto Third Ave — 390 ft
3. Turn left to stay on Third Ave — 335 ft
4. Turn right onto E 134th St — 299 ft
5. Turn left at the 1st cross street onto Lincoln Ave — 282 ft



Turn left onto E 135th St — 44 s (0.2 mi)

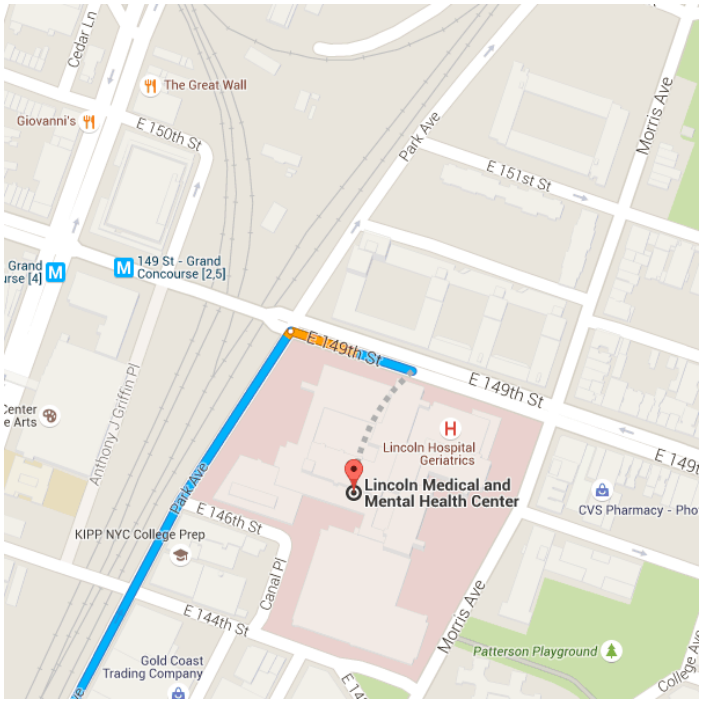
Continue onto Park Ave

3 min (0.6 mi)

Turn right onto E 149th St

Destination will be on the right

45 s (328 ft)



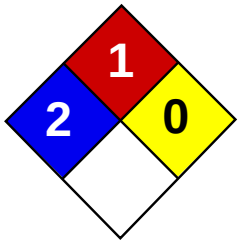
Lincoln Medical and Mental Health Center

234 East 149th Street, Bronx, NY 10451

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Attachment A: MSDS Fact Sheets

ATTACHMENT A
HEALTH AND SAFETY FACT SHEETS



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.

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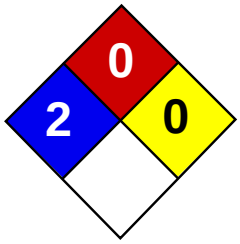

Material Safety Data Sheet
Tetrachloroethylene MSDS

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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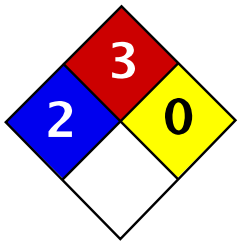

Health	2
Fire	3
Reactivity	0
Personal Protection	H

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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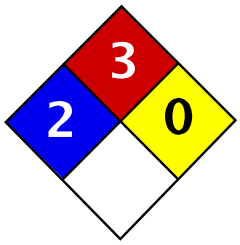

Health	2
Fire	3
Reactivity	0
Personal Protection	J

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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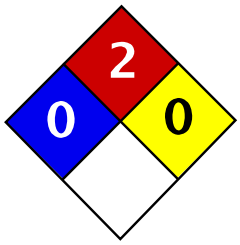

Health	0
Fire	2
Reactivity	0
Personal Protection	H

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.

Created: 10/09/2005 06:06 PM

Last Updated: 10/09/2005 06:06 PM

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

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**

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

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**

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

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

IMPORTANT LEGAL NOTICE:	Neither the CEC or the IPCS nor any person acting on behalf of the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use.

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

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

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.

---

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.

---

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.

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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

\-------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Lead (7439-92-1)	No	No	Yes	No

\-------\Federal, State & International Regulations - Part 2\----------

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.

---

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.

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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

```
--------\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)
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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

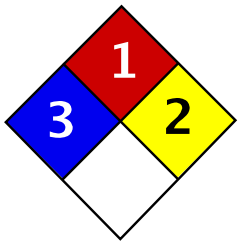
This product has a WHMIS classification of D2B.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

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



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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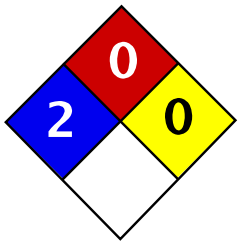

Health	2
Fire	0
Reactivity	0
Personal Protection	E

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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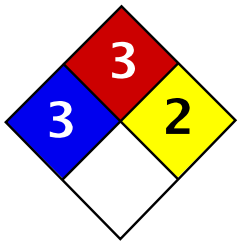

Health	3
Fire	3
Reactivity	2
Personal Protection	J

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**

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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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Last Updated: 11/06/2008 12:00 PM

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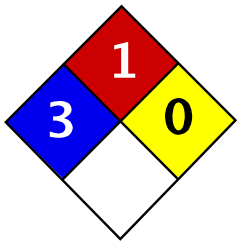

Health	3
Fire	1
Reactivity	0
Personal Protection	E

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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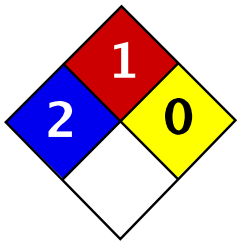

Health	2
Fire	1
Reactivity	0
Personal Protection	E

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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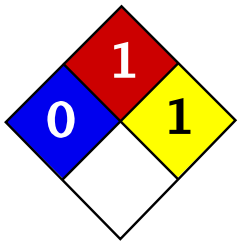


Health	1
Fire	3
Reactivity	2
Personal Protection	E

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.

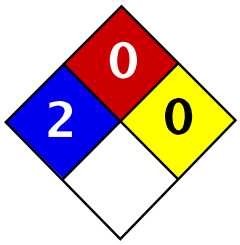
Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/09/2005 06:00 PM

Last Updated: 11/06/2008 12:00 PM



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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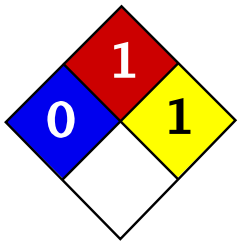

Health	1
Fire	1
Reactivity	1
Personal Protection	E

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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Last Updated: 11/06/2008 12:00 PM

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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?

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 im portant 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-a cid 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 **Lead and lead compounds (or lead salts), such as** • **lead acetate** • **lead chloride** • **lead nitrate** • **lead oxide** • **lead phosphate** • **lead acetate**	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. • **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 **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**	• Ingestion is the primary source of exposure to the general population. • 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
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Atlanta, GA 30333
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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

Department of Health and Human Services
Agency for Toxic Substances & Disease Registry

ATSDR Home › ToxFAQs™ Arsenic

ToxFAQs™

ToxFAQs™
for
Arsenic
(*Arsénico*)
August 2007

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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 hazardous 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

Exposure to higher than average levels of arsenic occur mostly in the workplace, near hazardous waste 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 cause 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 environment, 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 used to make "pressure-treated" lumber. CCA is no longer used in the U.S. for residential uses; it is still used in industrial applications. 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-blown 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 arsenobetaine 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 treating, 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
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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 .

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Last updated on Tuesday, May 2nd, 2006
URL: http://www.epa.gov/pesticides/factsheets/riskassess.htm

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

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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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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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