1041-1047 FULTON STREET

BROOKLYN, NEW YORK

Remedial Action Work Plan

NYC VCP Number: 14CVCP168K

OER Project Number: 13EHN319K

Prepared for:

Bleeker Street Gardens LLC

708 Sharrotts Road

Staten Island, NY 10309

(718) 967-3720

Prepared by:

AKRF, Inc.

440 Park Avenue South

New York, New York 10016

(212) 696-0670

SEPTEMBER 2013

Environmental and Planning Consultants

440 Park Avenue South
7th Floor
New York, NY 10016
tel: 212 696-0670
fax: 212 213-3191
www.akrf.com

April 24, 2014

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: NYCOER VCP Site No. 14CVCP168K, Project No. 13EHN319K
1045 Fulton Street (fka 1041-1047 Fulton Street), Brooklyn, NY
Remedial Action Work Plan (RAWP) Stipulation List

Dear Mr. Chawla:

AKRF hereby submits a Remedial Action Work Plan (RAWP) Stipulation List for 1045 Fulton Street, Brooklyn, NY (the Site) to the New York City Office of Environmental Remediation (OER) on behalf of Fulton Street Gardens LLC. Note that the Site was formerly identified as 1041 to 1047 Fulton Street comprising Block 1992, Lots 5, 6, 7, 8, and 9. Please note that the new development address is 1045 Fulton Street and the Site lots have been merged to Block 1992, Lot 9.

This letter serves as an addendum to the September 2013 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 **Addendum 1** will be utilized if additional petroleum containing tanks or vessels are identified during the remedial action or subsequent redevelopment excavation activities. All petroleum spills will be reported to the New York State Department of Environmental Conservation (NYSDEC) spills 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. 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 Voluntary Cleanup Program (VCP) Information Sheet (attached **Addendum 2**) announcing the remedial action. The Information sheet will be laminated and permanently affixed to the placard.
3. This NYC VCP project involving the removal and transportation of hazardous waste may be subject to the NYSDEC's Special Assessment Tax (ECL 27-0923) and Hazardous Waste Regulatory Fees (ECL 72-00402). See NYSDEC's website for more information: http://www.dec.ny.gov/chemical/9099.html.

4. Two groundwater wells will be installed and sampled after demolition of the site buildings in accordance with the March 2013 Phase II Environmental Site Investigation Work Plan. A groundwater sampling plan is attached as **Addendum 3**.

5. The vapor barrier will be installed beneath the new horizontal concrete building slabs (cellar-level and at street grade), vertical foundation basement walls, and pits. The waterproofing/vapor barrier design plans, including a plan view showing horizontal extent (Drawing No. H201) cross-section (Drawing Nos. H204 and H205). The September 2013 RAWP indicated that the vapor barrier would consist of Stego™ 20-mil vapor barrier or an equivalent product; the current plan is to use equivalent Grace products (the owner is contemplating using Fluorprufe 120 on the bottom of the foundation, Preprufe 160 on vertical walls to the west, east and south and Bituthene on the vertical wall to the north). A Site-specific compatibility letter from Grace for the proposed vapor barrier products and Grace specifications are attached as **Addendum 4**.

6. 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 contractor's 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 **Addendum 5**.

7. Daily reports will be provided to OER during active excavation work. If no work is performed for extended time period, daily report frequency will be reduced to weekly basis. The daily report template is attached in **Addendum 6**.

8. A pre-construction meeting is required prior to the 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.

9. A pre-approval letter from all disposal facilities will be provided to OER prior to any soil/fill material removal from the Site to that facility. Documentation specified in the RAWP Appendix 4 - 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.

With this Stipulation List, we request OER approval and issuance of the Notice to Proceed. Please feel free to contact Kate at 646-388-9525 with any questions.

Sincerely,
AKRF, Inc.

Marc S. Godick
Senior Vice President

Kathleen Brunner
Senior Technical Director

Enclosures

cc: H. Zhang – OER
B. Wade, T. Solimeo, J. Russo – Fulton Street Gardens LLC

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Addendum 1

Generic Procedures for Management of Underground Storage Tanks Identified Under the NYC VCP

Prior to underground storage tank (UST) 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).

Impacted Soil Excavation Methods

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 New York State Department of Environmental Conservation (NYSDEC) DER-10 Technical Guidance 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 PID.

Final excavation depth, length, and width will be determined in the field, and will depend on the horizontal and vertical extent of contaminated soils as identified through physical examination (staining, odors, sheen, PID response, 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 Construction 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 USTs 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. Tarps 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.

Addendum 2

Signage

NYC Voluntary Cleanup Program

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

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

Shaminder Chawla at (212) 788-8841

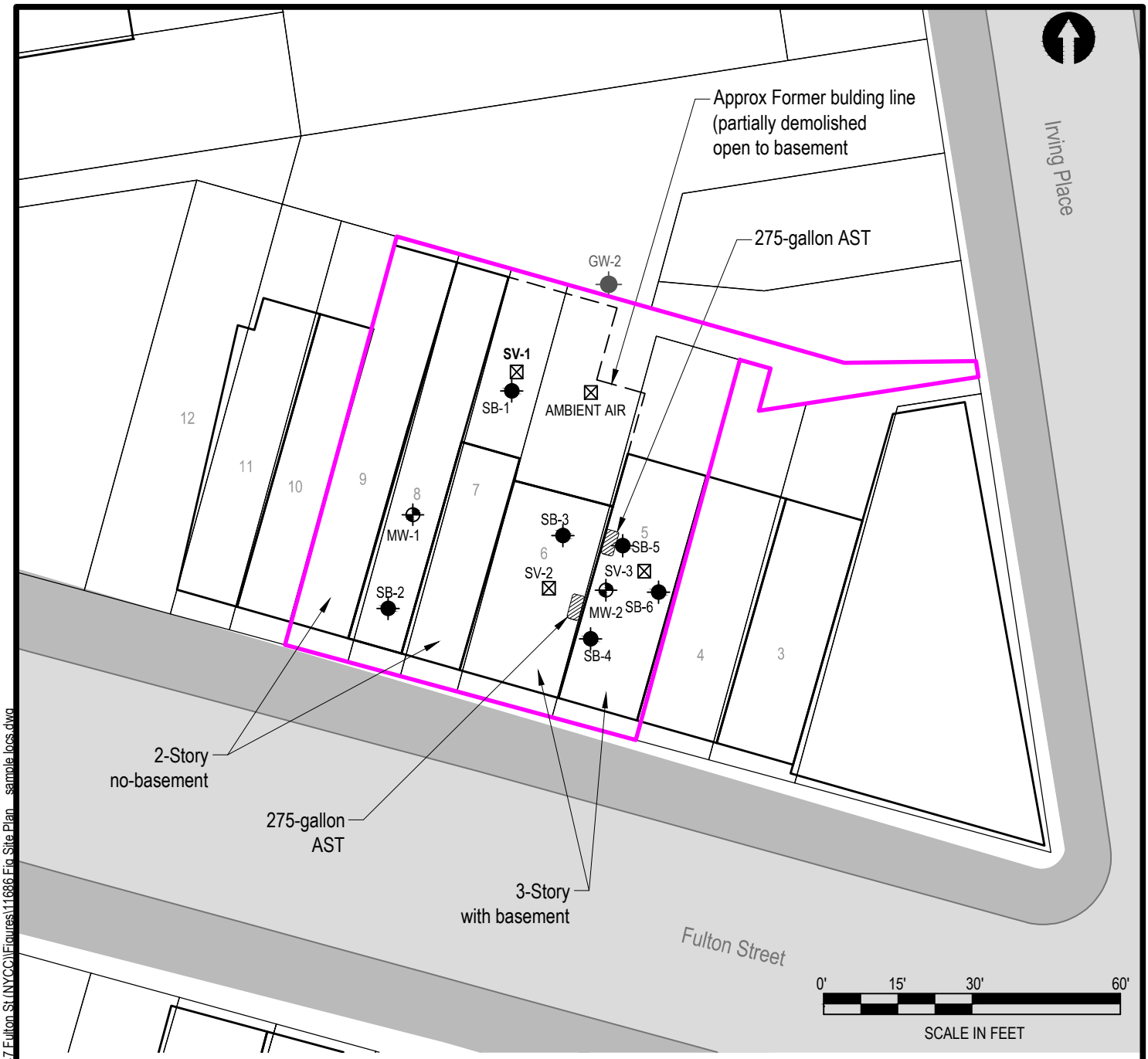
or email us at brownfields@cityhall.nyc.gov

1041-1047 Fulton Street

Site #: 14CVCP168K

Addendum 3

Groundwater Sampling Map



Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

LEGEND:

- PROJECT SITE BOUNDARY
- LOT LINE
- BUILDING LINE
- 6 TAX LOT NUMBER
- SB-2 SOIL BORING LOCATION (AKRF)
- SV-3 SOIL VAPOR BORING (AKRF)
- GW-2 OFF-SITE TEMPORARY GROUNDWATER MONITORING WELL LOCATION (POSILLICO)
- MW-1 PROPOSED SOIL BORING/ MONITORING WELL LOCATION

1041-1047 Fulton Street

Brooklyn, New York

SITE PLAN

AKRF
Environmental Consultants
440 Park Avenue South, New York, N.Y. 10016

DATE 7.23.2013
PROJECT No. 11686
SCALE as shown
FIGURE Addendum 3

Addendum 4

Vapor Barrier Pre-Certification letter

GRACE
Construction Products

Mark A. Franciosi
Technical Service Engineer - Americas

T 617-498-4303

mark.a.franciosi@grace.com

W. R. Grace & Co.-Conn.
62 Whittemore Avenue
Cambridge, MA 02140

April 7th, 2014

Michelle Lapin
AKRF, Inc.
440 Park Avenue South
7th Floor
New York, NY 10016

Re: 1041-1043 Fulton Street, Block 1992, Lots 7, 8, and 9. 1045 Fulton Street and 1047 Fulton Street, Block 1992, Lots 6 and 5. Clinton Hill, Brooklyn, NY - OER# 13EHN079K

Dear Ms. Lapin:

I have reviewed the following documents for the above referenced project:

- Tables 1a-1d from the August 2013 Remedial Investigation Report - Soil Analytical Results prepared by AKRF, Inc., dated 04/10/2013
- Appendix F/Table 2 from the August 2013 Remedial Investigation Report - Groundwater Analytical Results prepared by AKRF, Inc., dated 03/11/2008
- Table 2 from the August 2013 Remedial Investigation Report - Soil Vapor Analytical Results prepared by AKRF, Inc., dated 04/10/2013

The identified contaminants at the levels reported will not have an adverse effect on the waterproofing or vapor barrier properties of Preprufe® 300R, Preprufe® 160R or Bituthene® 3000/4000 and all system accessories, provided standard design and application procedures are followed.

Standard installation instructions and details can be found on our website at www.graceconstruction.com. If you have any questions, please feel free to call me at the number above.

Sincerely,

Mark Franciosi

Mark Franciosi

Technical Services Engineer - Americas

cc: J. Ridgeway

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:

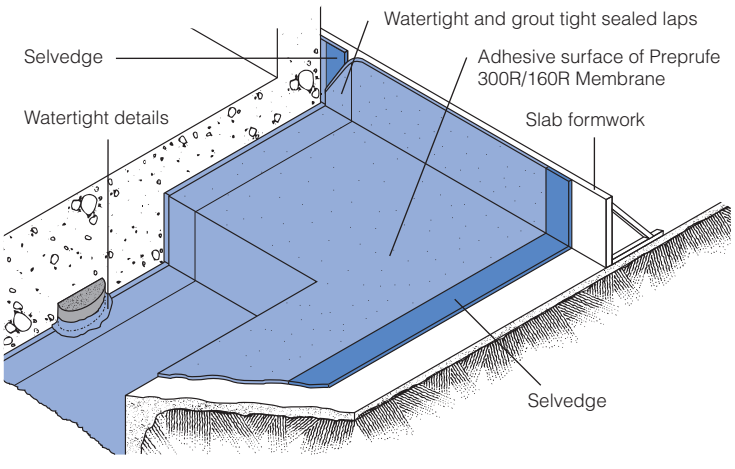
- **Preprufe 300R**—heavy-duty grade for use below slabs and on rafts (i.e. mud slabs). Designed to accept the placing of heavy reinforcement using conventional concrete spacers.
- **Preprufe 160R**—thinner grade for blindside, zero property line applications against soil retention systems.
- **Preprufe 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.
- **Adcor™ ES**—waterstop for joints in concrete walls and floors
- **Preprufe Tieback Covers**—preformed cover for soil retention wall tieback heads
- **Preprufe Preformed Corners**—preformed inside and outside corners

Preprufe 300R & 160R membranes are applied either horizontally to smooth prepared concrete, carton forms or well rolled and compacted earth 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



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

BBA BRITISH BOARD OF AGREMENT CERTIFICATE No. 97/3325

Installation

The most current application instructions, detail drawings and technical letters can be viewed at graceconstruction.com. 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.

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. When installing over earth or crushed stone, ensure substrate is well compacted to avoid displacement of substrate due to traffic or concrete pour. 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. Alternatively, Preprufe Low Temperature (LT) is available for low temperature condition applications. Refer to Preprufe LT data sheet for more information.

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 Letter 15 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. Fastening can be made through the selvedge using a small and low profile head fastener so that the membrane lays flat and allows firmly rolled overlaps. Immediately remove the plastic release liner.

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 edges and roll firmly (see Figure 3). Immediately remove printed plastic release liner from the tape.

Details

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

Membrane Repair

Inspect the membrane before installation of reinforcement steel, formwork and final placement of concrete. The membrane can be easily cleaned by power 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 membrane and tape.

It is recommended that concrete be poured within 56 days (42 days in hot climates) of application of the membrane. 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.

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.

Refer to Grace Tech Letter 17 for information on removal of formwork for Preprufe.

Figure 1

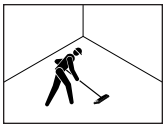


Figure 2

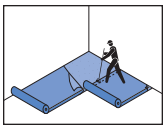
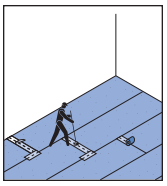
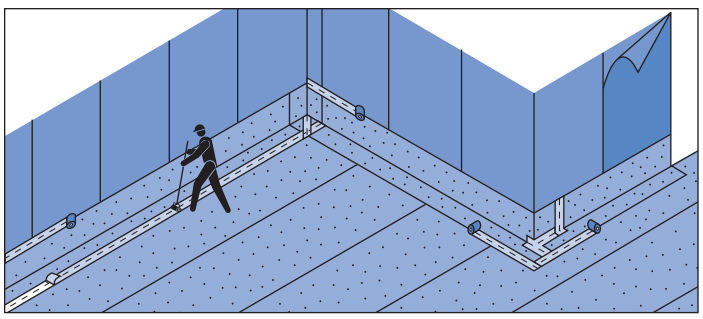


Figure 3

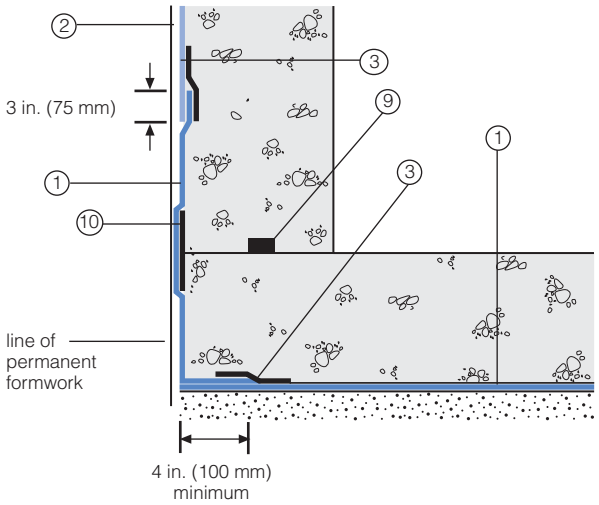




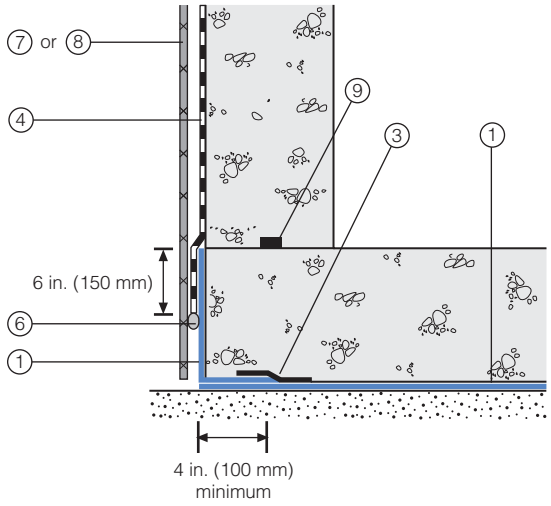
Detail Drawings

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

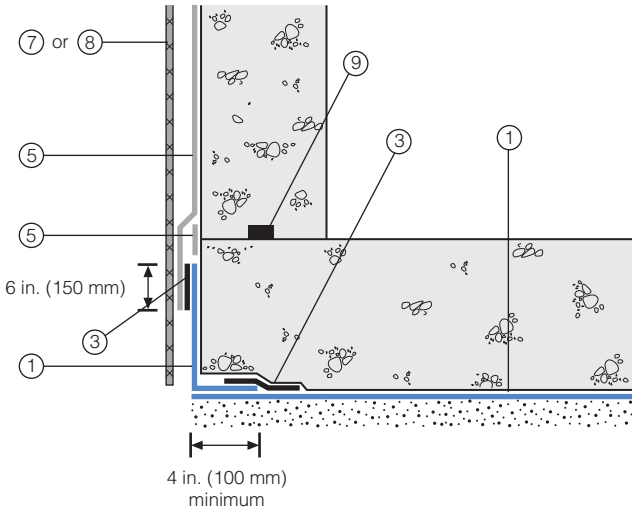
Wall base detail against permanent shutter



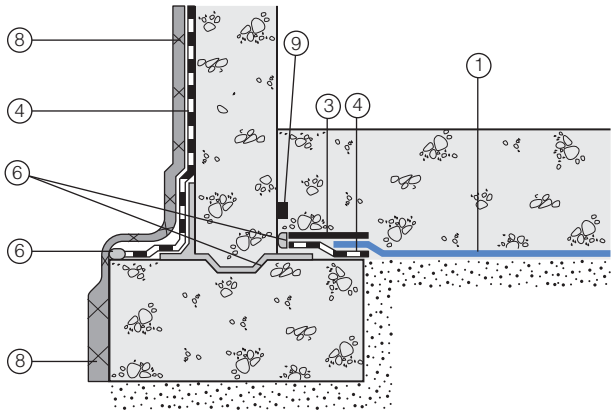
Bituthene wall base detail (Option 1)



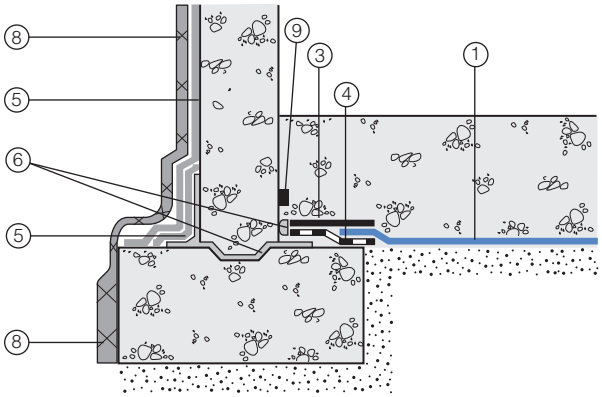
Procor wall base detail (Option 1)



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®
9 Adcor ES
10 Preprufe CJ Tape

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 ft² (36 m²)	460 ft² (42 m²)	
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)	0.032 in. (0.8 mm)	ASTM D3767
Lateral Water Migration Resistance	Pass at 231 ft (71 m) of hydrostatic head pressure	Pass at 231 ft (71 m) of hydrostatic head pressure	ASTM D5385, modified[1]
Low temperature flexibility	Unaffected at -20°F (-29°C)	Unaffected at -20°F (-29°C)	ASTM D1970
Resistance to hydrostatic head	231 ft (71 m)	231 ft (71 m)	ASTM D5385, modified[2]
Elongation	500%	500%	ASTM D412, modified[3]
Tensile strength, film	4000 psi (27.6 MPa)	4000 psi (27.6 MPa)	ASTM D412
Crack cycling at -9.4°F (-23°C), 100 cycles	Unaffected, Pass	Unaffected, Pass	ASTM C836
Puncture resistance	221 lbs (990 N)	100 lbs (445 N)	ASTM E154
Peel adhesion to concrete	5 lbs/in. (880 N/m)	5 lbs/in. (880 N/m)	ASTM D903, modified[4]
Lap peel adhesion	5 lbs/in. (880 N/m)	5 lbs/in. (880 N/m)	ASTM D1876, modified[5]
Permeance to water vapor transmission	0.01 perms (0.6 ng/(Pa x s x m²))	0.01 perms (0.6 ng/(Pa x s x m²))	ASTM E96, method B
Water absorption	0.5%	0.5%	ASTM D570

Footnotes:

1. Lateral water migration resistance is tested by casting concrete against membrane with a hole and subjecting the membrane to hydrostatic head pressure with water. The test measures the resistance of lateral water migration between the concrete and the membrane.
2. 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.
3. Elongation of membrane is run at a rate of 2 in. (50 mm) per minute.
4. 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.
5. 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.

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)

PF-111H Printed in U.S.A. 07/12 FA/PDF

GRACE

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)

PF-101A Printed in U.S.A. 07/13 FA/PDF

BITUTHENE® LIQUID MEMBRANE

Two component, elastomeric, liquid applied detailing compound for use with Grace waterproofing membranes

Description

Bituthene® Liquid Membrane is a two component, elastomeric, cold applied, trowel grade material designed for a variety of uses with the Grace waterproofing systems. The VOC (Volatile Organic Compound) content is 10 g/L.

Architectural and Industrial Maintenance Regulations limit the VOC content in products classified as Architectural Coatings. Refer to Technical Letters at www.graceconstruction.com for most current list of allowable limits.

Advantages

- **Liquid applied**—conforms to irregular profiles
- **Waterproof**—resistant to water vapor and water pressure
- **Tough, rubber-like**—flexible and damage resistant
- **Chemically cured**—unaffected by in-service temperature variations
- **Cold applied**—no flame hazard
- **System compatible**—formulated for use with Grace waterproofing membrane systems

Use

Bituthene Liquid Membrane is ideally suited for the following uses:

- Fillet material at inside corners
- Reinforcement material at inside corners
- Flashing material around drains, protrusions, curbs and parapets
- Sealing material at terminations
- Repair material for defects on concrete surfaces
- Flashing material at corners

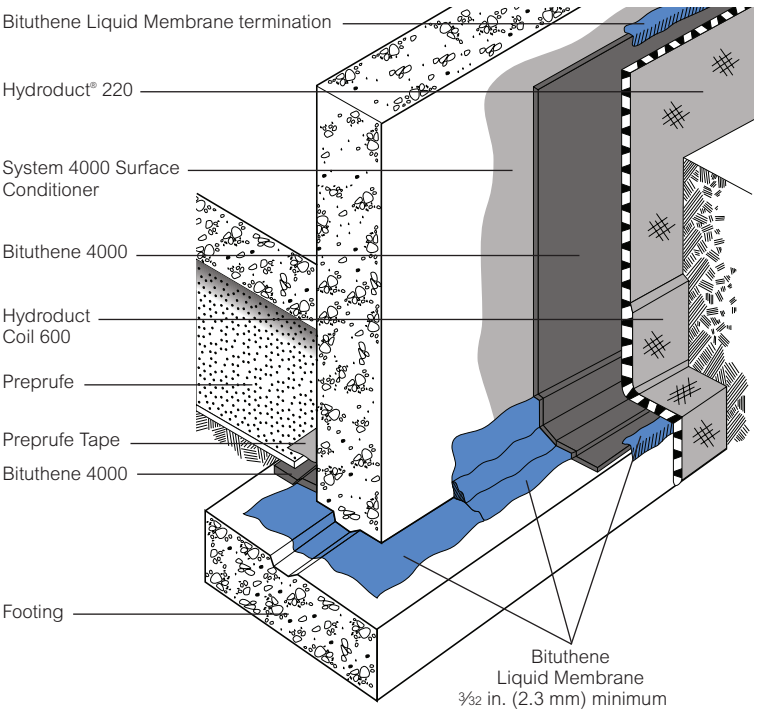
The two parts of Bituthene Liquid Membrane are mixed on site and troweled on to provide a simple and quick waterproofing detailing aid in conjunction with Bituthene, Preprufe® and Procor® systems.

Compatibility

Bituthene Liquid Membrane is completely compatible with Bituthene, Preprufe and Procor, and with existing asphalt or coal tar-based waterproofing materials. It is also compatible with cured silicone and polyurethane sealants. It is not compatible with creosote, pentachlorophenol, linseed oil or polysulfide-based sealants.

Product Advantages

- Liquid applied
- Waterproof
- Tough, rubber-like
- Chemically cured
- Cold applied
- System compatible



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

Supply

Bituthene Liquid Membrane (Parts A & B)		
Unit size	1.5 gal (5.7 L)	4 gal (15.1 L)
Weight per unit	16 lbs (8 kg)	44 lbs (20 kg)
Units per pallet	100	24

Physical Properties

Property	Typical Value	Test Method
Color		
Part A	Black	
Part B	Clear	
Mixture of Parts A and B	Black	
Solids content	100%	ASTM D1644
Elongation	250% minimum	ASTM D412
Peel strength	5 lbs/in. (880 N/m) minimum	ASTM D903
Flexibility, 180° bend over 1 in. (25 mm) mandrel at -25°F (-32°C)	Unaffected	ASTM D1970

Application Procedures

Safety, Storage and Handling Information

Bituthene products must be handled properly. Vapors from solvent-based primers and mastic are harmful and 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

All surfaces must be dry and free from dirt, grease, oil, dust or other contaminants. Bituthene Liquid Membrane may be applied at temperatures of 25°F (-4°C) or above. Below 40°F (5°C), store in a warm place before application.

Mixing

Add the entire contents of the Part B container to Part A and mix for 3 to 5 minutes until uniform. Part A is black and Part B is clear. Take care to scrape material from the side and bottom of the containers to assure thorough mixing. A low speed (150 rpm) mechanical mixer with flat paddle blades is required. Do not apply any material if streaks can be seen due to insufficient mixing.

Once mixed, Bituthene Liquid Membrane must be applied by trowel within 1.5 hours. More time is available at lower temperatures. At high temperatures, thickening and curing will be faster. Material that has thickened must be discarded. The material will cure to a very flexible rubber-like material.

Bituthene Liquid Membrane must be applied at a minimum thickness of 3⁄32 in. (2.3 mm) unless otherwise noted on details. In fillet applications, the face of the fillet should be a minimum of ¾ in. (20 mm). In corner flashing application details, it should extend 6 in. (150 mm) in each direction from the corner. Bituthene Liquid Membrane will adhere to primed or unprimed concrete.

Bituthene Liquid Membrane should be allowed to cure at least 24 hours before flood testing.

Coverage

As a fillet material, 1 gal (3.8 L) will cover approximately 100 linear feet (30 m). As a flashing material, 1 gal (3.8 L) will cover approximately 17 ft^2 (1.6 m^2). As a fillet and reinforcement, 1 gal (3.8 L) will cover approximately 14 linear feet (4.3 m).

Cleaning

Clean tools and equipment with mineral spirits before Bituthene Liquid Membrane has cured. Mineral spirits is a combustible liquid and should be used only in accordance with the manufacturer's safety recommendations. Do not use solvents to clean hands or skin.

www.graceconstruction.com

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

BIT-230D Printed in USA 3/07 FA/LI/1M

GRACE

Bituthene® 4000

Self-adhesive HDPE waterproofing membrane with enhanced bonding characteristics for use with B2 moisture tolerant primer.

Advantages

- **Cold applied** - simple application to substrates especially at low temperatures.
- **Suitable for application to "green" concrete** - reduces programme schedules
- **Moisture tolerant primer system** - allows application in damp or marginal weather conditions.
- **Wide application temperature range** - excellent bond to self and substrate from -10°C to +35°C.
- **Overlap security** - enhanced-bond provides additional security.
- **Cross laminated high density polyethylene carrier film** - provides high tear strength, puncture and impact resistance.
- **Flexible** - accommodates concrete shrinkage cracks.
- **Gas resistant** - methane, carbon dioxide and radon gas protection in excess of the standard membrane requirements in BRE Reports 211 (radon) and 212 (methane and carbon dioxide).

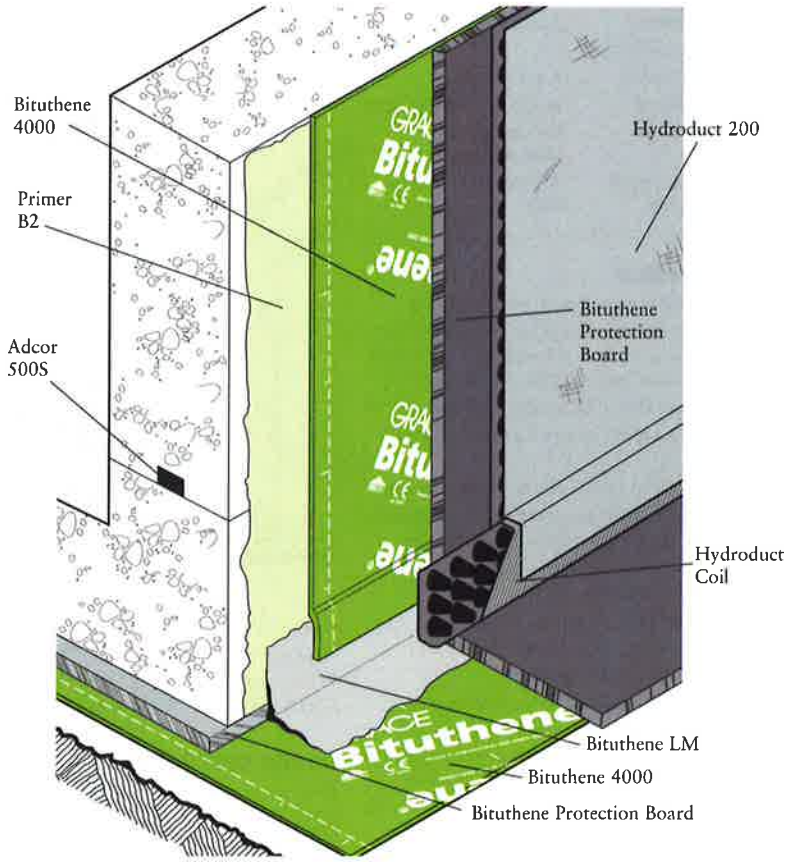
Description

Bituthene® 4000 is a flexible preformed waterproof membrane combining a high performance cross laminated, HDPE carrier film with a unique super sticky self-adhesive rubber bitumen compound.

Ancillary Products

Primer B2

Primer B2 is used to prepare vertical and sloping surfaces and suspended slabs. It is moisture tolerant and can be used on "green" concrete or damp to touch substrates.



Bituthene® LM

Waterproof continuity at angles and at penetrations is provided by Bituthene LM two component chemically curing liquid applied waterproof membrane.

Bituthene® Protection Boards

Damage from following trades and backfill is prevented by Bituthene® Protection Boards. Located with Bitustik™ 4000 double sided tape.

Details shown are typical illustrations only and not working drawings. For assistance with working drawings and additional technical advice please contact Grace Technical Services

EN 13967

GRACE Construction Products

Supply

Bituthene® 4000	1 m x 20 m roll (20 sq m) Weight 32 kg
Palletisation	15 rolls per pallet
Storage	Store upright in dry conditions below +30°C
Primer B2	5, 25 litre drums
Coverage	10 - 12 sq m per litre depending upon method of application, surface porosity and ambient temperature
Ancillary Products	
Bituthene® LM	5.7 litre packs
Bituthene® Protection Boards	3 mm x 1 m x 2 m
Adcor® 500S	6 x 5 m rolls
Hydroduct®	In lieu of drainage stone
Waterstops	See separate data sheet for details
Bitustik™ 4000 Lap Roller	150 mm x 12 m roll Unit

Installation

At air temperatures below +4°C measures should be taken to ensure that all surfaces are free from ice or frost. All surfaces except those below ground bearing slabs and Preprufe® R membranes should be primed with one coat of Primer B2 applied at a rate of approx. 10m² per litre.

Bituthene 4000 shall be laid by peeling back the protective release paper and applying the adhesive face onto the prepared surface, free from ice, frost, condensation or any contaminants which could adversely effect adhesion.

Bituthene LM to be applied at all internal and external corners, penetrations etc. prior to applying the overall membrane.

Bituthene 4000 should be brushed onto the surface to ensure good initial bond and exclude air. Adjacent rolls are aligned and overlapped 50mm minimum at side and ends and well rolled with a firm pressure, using a lap roller to ensure complete adhesion and continuity between the layers. On high walls it may be necessary to batten fix the membrane to prevent slippage.

Repairs

Damaged areas to be repaired by patching with an oversize patch applied to a clean dry surface and firmly rolled.

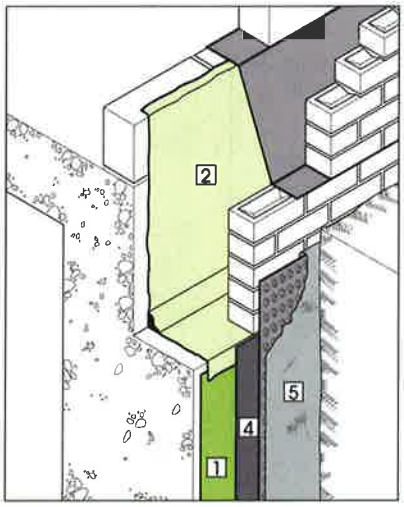
Performance

Bituthene 4000 complies with the relevant section of the following national standards:

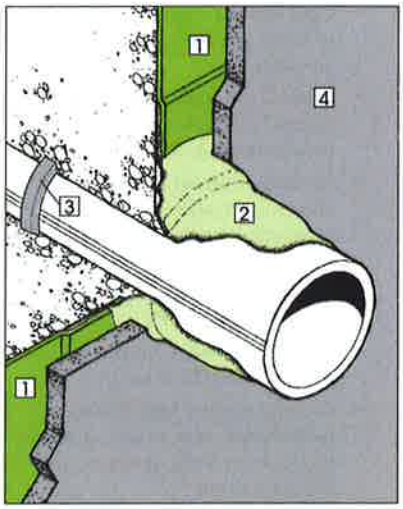
BS 8102:1990, Building Regulations (England and Wales) 1991 (amended 1994) clause C4. Building Regulations (Northern Ireland) 1994 (amended 1995) clause B2. Building Standard (Scotland) Regulations 1990, Regulation B2.1, G2.6.

Physical Properties

Property	Typical Results	Test Method
Elongation at max load	Long 244% Trans 185%	BS 2782 320 A
Tear Resistance	Long 77N Trans 92N	MOAT 27:5.4.1
Peel Strength	76.5 N/mm²	MOAT 27:5.1.3
Tensile Strength of joints	117N	MOAT 27:5.2.2
Moisture Vapour Permeability	0.31 g/m²/24 hours	BS 3177: 1959 (75% RH/25°C)
Puncture Resistance	220 N 65mm	ASTM E154
Water Resistance (6m head)	No penetration	MOAT 27:5.1.4
Environmental Resistance	Conforms	ASTM D543



Typical ground level termination detail



Pipe through wall detail

Key to diagrams:

1. Bituthene 4000 on Primer B2
2. Bituthene LM
3. Adcor 500S
4. Bituthene Protection Board
5. Hydroduct 220

Health and Safety

There is no legal requirement for a Material Safety Data Sheet for Bituthene 4000, Bituthene Protection Boards, Bitustik, Lap Roller, Hydroduct or waterstops. For health and safety questions on these products please contact Grace Construction Products Limited.

For Primer B2, and Bituthene LM read the product label and Material Safety Data Sheet (MSDS) before use. Users must comply with all risk and safety phrases. MSDS's can be obtained from Grace Construction Products or from our web site at www.graceconstruction.com.

NBS Specification Clause

Refer to Clause 180 and 190.

web Visit our web site at www.graceconstruction.com

Grace Construction Products Ltd, Ajax Avenue, Slough, Berkshire SL1 4BH United Kingdom Tel +44 (0)1753 692929 Fax +44 (0)1753 691623

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GRACE Construction Products

Addendum 5

BIG Program Insurance Requirements

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.

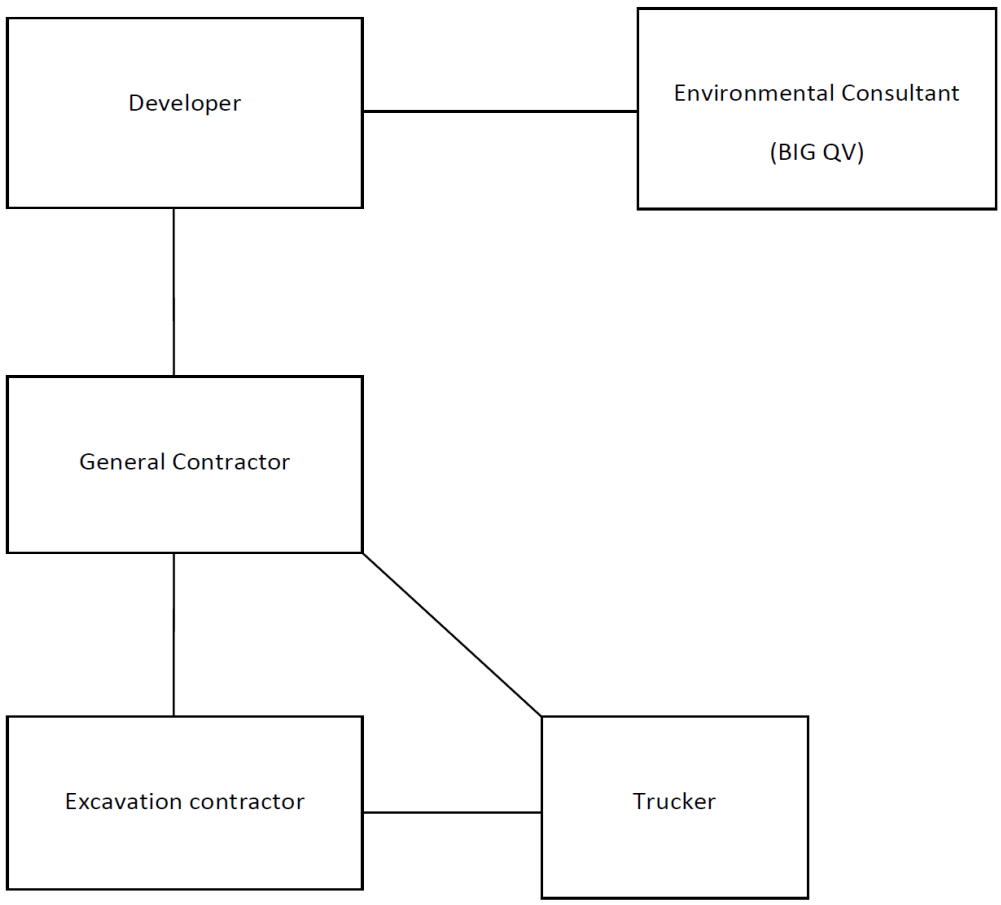
- Its environmental consultant(s) hired to oversee the cleanup must be:
  a. a BIG Qualifed Vendor; and
  b. maintain Professional Liability (PL) insurance of $1M per claim and annual aggregate.

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

Addendum 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

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

Prepared By:

Enter Your Name Here _____

VCP Project No.:	14CVCP168K	E-Number:	13EHAN319K	Date:	01/01/2014
Project Name:	1045 Fulton Street, Brooklyn, NY				

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

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 VCP	New York City Voluntary Cleanup Program
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York State Department of Health and Mental Hygiene
NYCRR	New York Codes Rules and Regulations
NYC OER	New York City Office of Environmental Remediation
NYS DEC	New York State Department of Environmental Conservation
NYS DEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYS DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
ORC	Oxygen-Release Compound
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
SSDS	Sub-slab Depressurization System
SVOC	Semi-Volatile Organic Compound
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

CERTIFICATION

I, Michelle Lapin, P.E., am a Professional Engineer licensed in the State of New York. I have primary direct responsibility for implementation of the remedial action for the 1041-1047 Fulton Street Site, VCP Site #14CVCP168K and OER project #13EHN319K.

I, Marc Godick, L.E.P am a Qualified Environmental Professional as defined in §43-140. I have primary direct responsibility for implementation of the remedial action for the 1041-1047 Fulton Street Site, VCP Site #14CVCP168K and OER project #13EHN319K.

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

Michelle Lapin
Name

073934
NYS PE License Number

Signature

9-24-13
Date

Marc Godick, LEP
QEP Name

QEP Signature

9-24-13
Date

EXECUTIVE SUMMARY

Bleeker Street Gardens LLC has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a 6,110-square foot site located at 1041-1047 Fulton Street in the Clinton Hill section of Brooklyn, New York (hereinafter referred to as the Site). A remedial investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP). The remedial action described in this document provides for the protection of public health and the environment consistent with the intended property use, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

Site Location and Current Usage

The Site is identified as Block 1992, Lots 5, 6, 7, 8, and 9 on the New York City Tax Map. Figure 1 shows the Site location. The Site is approximately 6,110 square feet and is bounded by residential properties to the north, Fulton Street to the south, and residential and commercial buildings to the east and west. A map of the Site boundary is shown on Figure 2.

Currently, the western building on the Site is used as a funeral home and the two eastern buildings are vacant (portions of the eastern buildings were reportedly formerly used as a funeral home). The Site contains three abutting buildings and landscaping is present along the northern side of the Site. The portion of the Site occupying 1041-1043 Fulton Street consists of two stories with no basement, the portion of the Site occupying 1045 Fulton Street consists of three stories with a basement, and the portion of the Site occupying 1047 Fulton Street consists of three stories with a basement. The northern portion of the buildings on Lots 6 and 7 are partially demolished to grade and a portion of the demolition extends into the two basements of these lots.

Summary of Proposed Redevelopment Plan

The contemplated development includes full demolition of the existing buildings and construction of a new approximately 3,900-square foot, eight-story residential building with one approximately 3,000-square foot basement level. It is anticipated that the basement level would be used for maintenance rooms, storage space, and laundry. The first floor would be used for a lobby and residential units, and the second through eighth floors would be used for residential purposes. The design also includes paved open space on the northern portion of the Site. The five site lots are expected to be merged as part of redevelopment. The current zoning designation is commercial/residential mixed use. The proposed use is consistent with existing

zoning for the property. Details of the proposed development plan are provided in Appendix 1.

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

Summary of the Remedy

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

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establishment of Site Specific (Track 4) Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Demolition of existing buildings and installation of two groundwater monitoring wells prior to development.
6. Excavation and removal of soil/fill exceeding Track 4 Site Specific SCOs within the planned excavation area. About 3,000 square feet of the property will be excavated to a depth of approximately 10 feet below grade for development purposes. A small portion of property will be excavated to a greater depth in one area of the Site to accommodate the elevator shaft, and the remainder of the property (on the northern side of the Site) will be unexcavated.
7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a photoionization detector (PID).

8. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations.

9. Transportation and off-site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite.

10. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of Site-Specific Track 4 SCOs.

11. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations (if any).

12. Placement of a demarcation layer above the residual soil/fill.

13. Installation of a vapor barrier system beneath the building slab and behind foundation sidewalls of the new building. The vapor barrier will consist of Stego™ 20-mil vapor barrier or an equivalent product.

14. Installation and operation of an active sub-slab depressurization system (SSDS). Following installation of the foundation slab, soil gas testing will be completed to evaluate whether a passive system would be more appropriate.

15. Construction and maintenance of an engineered composite cover consisting of concrete building foundations, paved areas, and a minimum two-foot clean fill buffer in any uncapped/ landscaped areas to prevent human exposure to residual soil/fill remaining under the Site.

16. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.

17. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.

18. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and describes all Engineering and Institutional Controls to be implemented at the Site.

19. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, monitoring and certification of Engineering and Institutional Controls and reporting at a specified frequency.

20. The property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and a requirement that management of these controls must be in compliance with an approved SMP. The SMP includes Institutional Controls that prohibits the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

COMMUNITY PROTECTION STATEMENT

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

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

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

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

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

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

Site Safety Coordinator. This project has a designated Site safety coordinator to implement the Health and Safety Plan. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site safety coordinator is Ashutosh Sharma and he can be reached at 646-388-9865.

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 Project Manager Kate Brunner at 646-388-9525 or NYC Office of Environmental Remediation Project Manager Horace Zhang at 212-788-8484.

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 am to 5 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 locations of project documents can be viewed.

Complaint Management. The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager Tom Solimeo at 718-967-3720, the NYC Office of Environmental Remediation Project Manager Shaminder Chawla at 212-442-3007, 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 overseen by trained and properly qualified personnel under the supervision of a 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 review in the public document repositories located at the New York Public Library - Bedford Branch.

Long-Term Site Management. If long-term protection after the cleanup is required, the property owner will be required to comply with an ongoing Site Management Plan that calls for continued inspection of protective controls, such as Site covers. The Site Management Plan is evaluated and approved by the NYC Office of Environmental Remediation. Requirements that the property owner must comply with are defined in the property's deed or established through a city environmental designation. A certification of continued protectiveness of the cleanup will be required from time to time to show that the approved cleanup is still effective.

REMEDIAL ACTION WORK PLAN

1.0 SITE BACKGROUND

Bleeker Street Gardens LLC has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 1041-1047 Fulton Street in the Clinton Hill section of Brooklyn, New York (the "Site"). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 Site Location and Current Usage

The Site is identified as Block 1992, Lots 5, 6, 7, 8, and 9 on the New York City Tax Map. Figure 1 shows the Site location. The Site is approximately 6,110 square feet and is bounded by residential properties to the north, Fulton Street to the south, and residential and commercial buildings to the east and west. A map of the Site boundary is shown on Figure 2.

Currently, the western building on the Site is used as a funeral home and the two eastern buildings are vacant (portions of the eastern buildings were reportedly formerly used as a funeral home). The Site contains three abutting buildings and landscaping is present along the northern side of the Site. The portion of the Site occupying 1041-1043 Fulton Street consists of two stories with no basement, the portion of the Site occupying 1045 Fulton Street consists of three stories with a basement, and the portion of the Site occupying 1047 Fulton Street consists of three stories with a basement. The northern portion of the buildings on Lots 6 and 7 are partially demolished to grade and a portion of the demolition extends into the two basements of these lots.

1.2 Proposed Redevelopment Plan

The contemplated development includes full demolition of the existing buildings and construction of a new approximately 3,900-square foot eight-story residential building with one approximately 3,000-square foot basement level. It is anticipated that the basement level would be used for maintenance rooms, storage space, and laundry. The first floor would be used for a lobby and residential units, and the second through eighth floors would be used for residential purposes. The design also includes paved open space on the northern portion of the Site. The

five site lots are expected to be merged as part of redevelopment. The current zoning designation is commercial/residential mixed use. The proposed use is consistent with existing zoning for the property. Details of the proposed development plan are provided in Appendix 1.

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

1.3 Description of Surrounding Property

The Site was abutted by a residential building to the north; Fulton Street, and underground subway tunnels to the south, beyond which are a church, mixed-use commercial and residential buildings, and an educational institute; commercial and residential buildings and Irving Place to the east; and mixed-use commercial and residential buildings and an empty lot apparently under construction and Downing Street to the west. The surrounding area is primarily residential to the north and commercial and residential to the east, south, and north. A child care facility, the Irving Place Child Development Center, was identified northeast of the Site, across Irving Place. Hazardous materials and noise E-Designations, E-183, were assigned to the Site and much of the surrounding area as part of the Fort Greene/Clinton Hill Rezoning.

Figure 1 shows the surrounding land usage.

1.4 Remedial Investigation

A remedial investigation was performed and the results are documented in a companion document called "*Remedial Investigation Report*, 1041-1047 Fulton Street", dated June 2013 (RIR).

The RI included the following scope of work completed at the Site:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e., structures, buildings, etc.);
2. Installed 6 soil borings across the entire project Site, and collected 12 soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed three soil vapor probes across the project Site and collected three soil vapor samples and one ambient air sample for chemical analysis.
4. Groundwater sampling was not performed as part of the RI due to drilling limitations with existing buildings, the presence of a subway structure south of the site, and depth to water requiring more intensive drilling techniques. After building demolition, groundwater sampling will be performed in accordance with the approved Phase II

Environmental Site Investigation Work Plan. Groundwater results for the north-adjacent property were evaluated as a representation of general groundwater quality in the vicinity of the Site. Sample locations are shown on Figure 2.

Summary of Environmental Findings

1. The results of the soil sampling completed during the RI showed no volatile organic compounds (VOCs) detected at concentrations exceeding NYSDEC Unrestricted Use Soil Cleanup Objectives (UUSCOs or Track 1 SCOs) or Restricted Residential Soil Cleanup Objectives (RRSCOs or Track 2 SCOs). Tetrachloroethene (PCE) was detected in two soil samples, and gasoline-related compounds (ethylbenzene, toluene and xylenes) were detected in one sample; all of which were at trace, low-level concentrations. Up to 20 polycyclic aromatic hydrocarbons (PAHs) were detected in eight soil samples with a maximum concentration of 8.2 parts per million (ppm) in a shallow soil sample collected within the first two feet in the rear yard of the Site. A total of five PAHs including benzo(a)anthracene (max. of 2.4 ppm), benzo(a)pyrene (max. of 2.7 ppm), benzo(b)fluoranthene (max. of 3.3 ppm), dibenzo(a,h)anthracene (max. of 0.53 ppm), and indeno(1,2,3-cd)pyrene (max. of 1.9 ppm) were detected in one soil boring at concentrations exceeding their respective Restricted Residential SCO. Four metals including barium (max. of 363 ppm), copper (max. of 80 ppm), lead (max. of 1,800 ppm), mercury (max. of 1.3 ppm) and zinc (max. of 412 ppm) exceeded Unrestricted Use SCOs. Of these metals, lead and mercury were also detected above Unrestricted Use SCOs in one soil sampling location. Polychlorinated biphenyls (PCBs) were not detected in any of the soil samples and none of the low-level detections of pesticides exceeded applicable NYSDEC RRSCOs. Overall, no evidence of a contamination source area was noted during the soil sampling activities. There was no evidence of a release or spill (e.g., odors, staining, or significant PID readings) during any of the soil sampling activities.
2. Groundwater sampling was not performed as part of the RI due to drilling limitations with existing buildings, the presence of a subway structure south of the Site, and depth to water requiring more intensive drilling techniques. After building demolition, groundwater sampling will be performed in accordance with the approved Phase II Environmental Site Investigation Work Plan. A historic off-site Phase II site

investigation report containing sampling results from two off-site groundwater monitoring wells sampled in 2008 were reviewed. Results indicated that SVOCs, pesticides, or PCBs were not detected in the groundwater samples analyzed. Metals and two VOCs were detected above NYSDEC Class GA (drinking water) standards. Additional groundwater investigation will be performed prior to Site development.

3. The results of the soil vapor and ambient air sampling conducted during the RI showed 23 VOCs detected in the four samples. VOCs associated with petroleum [benzene, toluene, ethylbenzene, xylenes (collectively referred to as BTEX), n-heptane, n-hexane, and 2,2,4-trimethylpentane] were detected at concentrations up to 690 micrograms per cubic meter ($\mu g/m^3$). Solvent-related VOCs (acetone, TCE, chloroform, cyclohexane, methyl ethyl ketone (MEK), and methylene chloride) were detected at concentrations up to 740 $\mu g/m^3$. PCE, carbon tetrachloride and TCA were not detected in any soil vapor samples. TCE was detected in one of three soil vapor samples, at a concentration of 42 $\mu g/m^3$, which exceeds the New York State Department of Health (NYSDOH) Air Guideline Value (AGV) of 5 $\mu g/m^3$. However, this concentration was below the NYSDOH 2006 Soil Vapor Intrusion sub-slab vapor concentration matrix guidance value of 250 $\mu g/m^3$ established to determine if mitigation is appropriate to minimize current or potential exposures associated with soil vapor intrusion. TCE was not detected in the soil samples at the Site or in groundwater samples from the north-adjacent site.

For more detailed results, consult the RIR. Based on an evaluation of the data and information from the RIR and this RAWP, disposal 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:

2.1 Soil

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

2.2 Soil Vapor

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

2.3 Groundwater

- Remove contaminant sources potentially causing impact to groundwater.
- Groundwater sampling was not performed as part of the RI due to drilling limitations with existing buildings, the presence of a subway structure south of the site, and depth to water requiring more intensive drilling techniques. After all buildings are demolished, groundwater sampling will be performed in accordance with the approved Phase II Environmental Site Investigation Work Plan.

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). A remedy is then developed based on the following nine 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**
    - Establishment of 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 UUSCOs have been achieved with post-excavation endpoint sampling. Based on the results of the remedial investigation, it is expected that this alternative would require excavation to a minimum depth of 20 feet on the western portion of the Site and approximately 10 feet across the remainder of the Site to remove all historic fill. Excavation for development purposes would take place to a depth of approximately 10 feet across the building footprint. Excavation and soil removal would be conducted at greater depths in select areas of the Site to accommodate elevator shafts. If soil/ fill containing

analytes at concentrations above Track 1 UUSCOs 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 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 an Sub Slab Depressurization system (SSDS) and a vapor barrier beneath the basement foundation and behind foundation sidewalls of the new building would be installed as part of new development to prevent future exposures from off-site soil vapor.
- Placement of a final cover over the entire Site as part of new construction.

- **Alternative 2 involves**
  - Establishment of Track 4 Site-Specific SCOs.
  - Removal of all soil/fill exceeding Track 4 Site-Specific SCOs to the extent practical and confirmation that Track 4 has been achieved with post-excavation endpoint sampling. Excavation for development purposes would take place to a depth of approximately 10 feet across the building footprint. Excavation and soil removal will be conducted at greater depths in select areas of the Site to accommodate elevator shafts.
  - Placement of a final cover over the entire Site to eliminate exposure to remaining soil/fill;
  - Placement of a vapor barrier beneath the building slab and outside foundation side walls to prevent soil vapor entering the new building;
  - Installation of an active sub-slab depressurization system (SSDS);
  - Establishment of use restrictions including prohibitions on the use of groundwater from the Site and prohibitions on sensitive site uses, such as farming or vegetable gardening, to eliminate future exposure pathways;
  - 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; and

- The property will continue to be registered with an E-Designation at the NYC Buildings Department.

3.1 Threshold Criteria

Protection of Public Health and the Environment

This criterion is an evaluation of the remedy's ability to protect public health and the environment, and an assessment of how risks posed through each existing or potential pathway of exposure are eliminated, reduced or controlled through removal, treatment, and implementation of Engineering Controls or Institutional Controls. Protection of public health and the environment must be achieved for all approved remedial actions.

Alternative 1 would be protective of human health and the environment by removing the historic fill and contaminated soils at the Site, 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 since soil to a depth of approximately 10 feet will be removed for purposes of new development and by ensuring that remaining soil/fill on-Site meets Track 4 Site-Specific SCOs to the extent practical as well as by placement of institutional and engineering controls, including an SSDS and a composite cover system. SSDS would prevent vapor intrusion in new development and the composite cover system would prevent direct contact with any remaining on-Site soil/fill and groundwater. Implementing institutional controls including continuation of the E-designation and a site management plan would ensure that the composite cover system remains intact and protective. Establishment of Track 4 Site-Specific SCOs would minimize the risk of contamination leaching into groundwater.

For both Alternatives, potential exposure to contaminated soils during construction would be minimized by implementing an approved Soil and Materials Management Plan and Community Air Monitoring Plan (CAMP). As groundwater is approximately 60 feet below grade, there is not a potential for contact with contaminated groundwater. Groundwater is not used for potable water supply. Potential migration of soil vapors into the new building would be prevented by installing a vapor barrier and active sub-slab depressurization system as part of new construction. Following installation of the foundation slab, soil gas testing will be completed to evaluate whether a passive SSDS would be more appropriate.

3.2 Balancing Criteria

3.2.1 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 to Track 1 Unrestricted Use SCOs and Groundwater Protection Standards. Compliance with SCGs for soil vapor would also be achieved by installation of a vapor barrier system below the new building's basement slab and continuing the vapor barrier around foundation walls, and a concrete building slab would be constructed over the entirety of the Site as part of new construction.

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 installation of an SSDS and a vapor barrier system below the new building's basement slab and continuing the vapor barrier around foundation walls, and a concrete building slab would be constructed over the entirety of the Site. 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 would 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 would protect on-site workers and the surrounding community from exposure to Site-related contaminants.

3.2.2 Short-term Effectiveness and Impacts

This evaluation criterion assesses the effects of the alternative during the construction and implementation phase until remedial action objectives are met. Under this criterion, alternatives are evaluated with respect to their effects on public health and the environment during implementation of the remedial action, including protection of the community, environmental impacts, time until remedial response objectives are achieved, and protection of workers during remedial actions.

Both alternatives 1 and 2 have similar short-term effectiveness during their respective implementations, as each requires excavation of historic fill material. Both alternatives would result in short-term dust generation impacts associated with excavation, handling, load out of

materials, and truck traffic. Short term impacts could potentially be higher for Alternative 1 if excavation of greater amounts of historical fill material are encountered below the excavation depth of the proposed building (10 feet). 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 80, 25-ton capacity truck trips would be necessary to transport fill and soil excavated during Site development under Alternative 2.

The remedial alternatives would also employ appropriate measures to prevent short term impacts, through the use of a Soil and Materials Management Plan (SMMP) during all on-site soil disturbance activities and would effectively mitigate the release of significant contaminants into the environment by properly handling and disposing of soil encountered during the development. Construction workers operating under appropriate management procedures (site-specific CHASP) will be protected from on-site contaminants through the use of the appropriate personal protective equipment.

3.2.3 Long-term Effectiveness and Permanence

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

Alternative 1 would achieve long-term effectiveness and permanence by permanently removing all contaminated soil/ fill material. Removal of on-site contaminant sources would prevent future groundwater contamination.

Alternative 2 would provide long-term effectiveness by removing most on-site contamination, installing a composite cover system across the Site, installing a vapor barrier and SSDS, maintaining use restrictions, establishing a Site Management Plan to ensure long-term management of Institutional Controls (ICs) and Engineering Controls (ECs), and leaving the E-Designation in place 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 use restrictions continue to be in place and are functioning as they were intended assuring that protections designed into the remedy will provide continued high level of protection in perpetuity.

3.2.4 Reduction of Toxicity, Mobility, or Volume of Contaminated Material

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

Alternative 1 would permanently eliminate the toxicity, mobility, and volume of contaminants from on-site soil by meeting Track 1 Unrestricted Use SCOs.

Alternative 2 would permanently eliminate the toxicity, mobility, and volume of contaminants by removing most of the contaminated soil present on the Site and any remaining soil/fill beneath the new building would meet Track 4 Site-Specific SCOs and would be handled as residual contamination addressed via the composite site cover, vapor barrier, SSDS and implementation of the SMP. Alternative 1 would eliminate a greater total mass of contaminants on Site due to the additional excavation that would be required under this alternative.

3.2.5 Implementability

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

The proposed remedial action under Alternative 1 may not be feasible due to limitations posed by the adjacent subway. MTA approval and earthwork permits are expected to be required for completion of the site redevelopment and implementation of the remedy. Alternative 2 is feasible and implementable and uses reliable methods and standard construction technologies.

Standard construction equipment utilized for the overall earthwork would be used. The techniques, materials and equipment to implement Alternative 2 are readily available and have been proven effective in remediating and/or mitigating the contaminants associated with the Site. OSHA trained personnel would complete all activities that include excavation and handling of petroleum-contaminated or other soils with contamination beyond that associated with typical historical fill material. The reliability of Alternative 2 is also high. There are no special difficulties associated with any of the activities proposed.

3.2.6 Cost Effectiveness

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

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

It may be cost effective to remove all historic fill and other contaminated soils that exceed the Unrestricted Use Track 1 SCOs during redevelopment to eliminate potential costs for investigation or remediation by future landowners or lessees. As such, initial costs associated with Alternative 1 would be significantly higher than Alternative 2 due to the removal of a greater volume of soil. Long-term costs are anticipated to be higher for Alternative 2 than Alternative 1 based on the need to implement a Site Management Plan as part of Alternative 2 and long term operation of an active SSDS, if necessary. In both cases, appropriate public health and environmental protections are achieved.

3.2.7 Community Acceptance

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

Based on the overall goals of the remedial program and the proposed site development, no adverse community opinion is anticipated during the project. This RAWP will be subject to and undergo public review under the NYC VCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedial action. Any public comments related to environmental remediation will be considered by OER and Bleeker Street Gardens

LLC prior to the approval and execution of the remedial plan. The Citizen Participation Plan for the project is provided in Appendix 2.

3.2.8 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 remedial alternatives are appropriate with respect to the proposed use and to land uses in the vicinity of the Site. The proposed redevelopment of the Site is compatible with the existing zoning designation for the property and is consistent with recent development patterns. Following remediation, the Site will meet either Track 1 Unrestricted Use or Track 4 Site-Specific SCOs (with residual contamination addressed by Engineering Controls and Institutional Controls), both of which are appropriate for its planned residential use. The Site is surrounded by commercial and mixed-use commercial/residential properties and the proposed cleanup provides comprehensive protection of public health and the environment for these uses. Improvements in the current environmental condition of the property achieved by both alternatives are also consistent with the City's goals for cleanup of contaminated land and bringing such properties into productive reuse. Both alternatives are equally protective of natural resources and cultural resources.

3.2.9 Sustainability of the Remedial Action

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

The remedial plan would take into consideration the shortest trucking routes during off-site disposal of historic fill and other soils, which would reduce greenhouse gas emissions and conserve energy used to fuel trucks. To the extent practicable, energy efficient building materials, appliances, and equipment will be utilized to complete the development. A sustainability statement is provided in **Appendix 3.**

4.0 REMEDIAL ACTION

4.1 Summary of Preferred Remedial Action

The preferred remedial action alternative is Alternative 2, the Track 4 Alternative. The preferred remedial action alternative achieves protection of public health and the environment for the intended use of the property. The preferred remedial action alternative will achieve all of the remedial action objectives established for the project and addresses applicable SCGs. The preferred remedial action alternative is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants. The preferred remedial action alternative is cost effective and implementable and uses standard methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establishment of Site Specific (Track 4) Soil Cleanup Objectives (SCOs).
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Demolition of existing buildings and installation of two groundwater monitoring wells prior to development.
6. Excavation and removal of soil/fill exceeding Track 4 Site Specific SCOs within the planned excavation area. About 3,000 square feet of the property will be excavated to a depth of approximately 10 feet below grade for development purposes. A small portion of property will be excavated to a greater depth in one area of the Site to accommodate the elevator shaft, and the remainder of the property (on the northern side of the Site) will be unexcavated.
7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a photoionization detector (PID).

8. Removal of underground storage tanks (if encountered) and closure of petroleum spills (if evidence of a spill/leak is encountered during Site excavation) in compliance with applicable local, State and Federal laws and regulations.

9. Transportation and off-site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media onsite.

10. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of Site Specific Track 4 SCOs.

11. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations (if any).

12. Placement of a demarcation layer above the residual soil/fill.

13. Installation of a vapor barrier system beneath the building slab as well as behind foundation sidewalls of the new building.. The vapor barrier will consist of Stego™ 20-mil vapor barrier or an equivalent product.

14. Installation and operation of an active sub-slab depressurization system (SSDS). Following installation of the foundation slab, soil gas testing will be completed to evaluate whether a passive system would be more appropriate.

15. Construction and maintenance of an engineered composite cover consisting of concrete building foundations, paved areas, and a minimum two-foot clean fill buffer in any uncapped/ landscaped areas to prevent human exposure to residual soil/fill remaining under the Site.

16. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations.

17. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.

18. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and describes all Engineering and Institutional Controls to be implemented at the Site.

19. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for operation, monitoring and certification of Engineering and Institutional Controls and reporting at a specified frequency.

20. The property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and a requirement that management of these controls must be in compliance with an approved SMP. The SMP includes Institutional Controls that prohibits of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

4.2 Soil Cleanup Objectives and Soil/Fill Management

Track 4 Soil Cleanup Objectives (SCOs) are proposed for this project. The following Track 4 Site-Specific SCOs will be used:

Contaminant	**Track 4 SCOs**
Total SVOCs	250 ppm
Lead	1,000 ppm
Mercury	2.0 ppm

Soil and materials management on-site and off-site, including excavation, handling and disposal, will be conducted in accordance with the Soil/Materials Management Plan in Appendix 4. The location of planned excavations is shown on Figure 3.

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

4.2.1 Estimated Soil/Fill Removal Quantities

Based on partial site excavation and a proposed cellar depth of 10 feet below grade, the total quantity of soil/fill expected to be excavated and disposed off-site is estimated at 2,000 tons. Disposal facilities will be reported to OER when they are identified and prior to the start of remedial action.

4.2.2 End-Point Sampling

Removal actions for development purposes under this plan will be performed in conjunction with confirmation soil sampling. Four confirmation samples will be collected from the base of the excavation. Sample locations are shown on Figure 5. For comparison to Track 1 SCOs, analytes will include SVOC, pesticides, PCBs and metals according to analytical methods described below. For comparison to Track 4 SCOs, analytes will only include trigger compounds and elements established on the Track 4 SCO list (SVOCs, lead and mercury).

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

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.

2. For excavations 20 to 300 feet in perimeter:

   - For surface removals, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
   - For subsurface removals, one sample from each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.

3. For sampling of volatile organics, if needed, 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 to 3 above.

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

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

Soil analytical methods for endpoint samples will include Track 4 SCO list:

- Semi-volatile organic compounds by EPA Method 8270;
- Lead by EPA Method 6010; and
- Mercury by EPA Method 7471.

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

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

Samples will be collected in accordance with the following procedures:

- Record sample observations (evidence of contamination, PID readings, soil classification) in field log book.
- Collect an aliquot of soil or groundwater using a dedicated and disposable plastic sample spoon or sample bailer and place in laboratory-supplied sample jars. One grab sample will be collected for volatile organic compound analysis, if applicable. One composite sample will be collected for all other analyses.
- Seal and label the sample jars as described below and place in a chilled cooler.

Decontamination Procedures

To avoid contamination and cross-contamination of samples, only dedicated or disposable sampling equipment may be used to collect these samples. All non-disposable equipment involved in field sampling must be decontaminated before being brought to the sampling location, and must be properly decontaminated after use.

Sample Identification

All samples will be consistently identified in all field documentation, chain-of-custody documents and laboratory reports using an alpha-numeric or alpha-alpha code. For stockpiled soil, the alpha prefix will be “SP” and the numbers following the alpha prefix will correspond to excavated stockpiles, beginning with “1, 2, 3…etc.” For example, the first sample collected from the first stockpile will be labeled “SP-1-1” and the first sample collected from the second stockpile will be labeled “SP-2-1.”

For groundwater samples, the alpha prefix will be “GW” and the number following the prefix will correspond to the sample number. For example, the first groundwater sample collected for sample analysis will be labeled “GW-1” and the second sample will be “GW-2.”

Sample Labeling and Shipping

All sample containers will be labeled with the following information:

- Site identification
- Sample identification
- Date and time of collection
- Analysis(es) to be performed
- Sampler's initials

Once the samples are collected and labeled, they will be placed in chilled coolers and stored in a cool area away from direct sunlight to await shipment to the laboratory. Soil samples will be shipped to the laboratory at a frequency that will not result in an exceedance of applicable holding times for sample methods. At the start and end of each workday, field personnel will add ice to the coolers as needed.

The samples will be prepared for shipment by placing each sample jar in a sealable plastic bag, then wrapping each bag in bubble wrap to prevent breakage, adding freezer packs and/or fresh ice in sealable plastic bags and the chain-of-custody form. Samples will be shipped overnight (e.g., Federal Express) or transported by a laboratory courier. All coolers shipped to the laboratory will be sealed with mailing tape and a chain-of-custody (COC) seal to ensure that the coolers remain sealed during delivery.

Sample Custody

Field personnel will be responsible for maintaining the sample coolers in a secured location until they are picked up and/or sent to the laboratory. The record of possession of samples from the time they are obtained in the field to the time they are delivered to the laboratory or shipped off-site will be documented on COC forms. The COC forms will contain the following information: project name; names of sampling personnel; sample number; date and time of collection and matrix; and signatures of individuals involved in sample transfer, and the dates and times of transfers. Laboratory personnel will note the condition of the custody seal and sample containers at sample check-in.

Documentation

A sample log book will be maintained. The following information, as a minimum will be recorded to the log.

- Sample identification number
- Sample location

- Field Observations
- Sample Type
- Analyses
- Date/Time of collection
- Collector's name
- Sample procedures and equipment utilized
- Date sent to laboratory/name of laboratory
- Copies of site drawings indicating stockpile numbers and locations

4.2.4 Import and Reuse of Soils

Import of soils onto the property and reuse of soils already onsite will be performed in conformance with the Soil/Materials Management Plan in Appendix 4. The need and quantity for backfill at the Site cannot be determined at this stage of the development; however, any areas backfilled at the Site will be properly documented. On-site soil/fill is not expected to be reused/relocated on-site.

4.3 Engineering Controls

The excavation required for the proposed Site development will strive to achieve Track 4 Site Specific SCOs. Engineering Controls were employed in the remedial action to address residual contamination remaining at the site after excavation for the proposed building. The Site has three primary Engineering Control Systems. These are:

- Composite Cover System
- Vapor Barrier
- Sub-slab Depressurization System

4.3.1 Composite Cover System

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

- concrete building slab;
- paved areas; and

- minimum two-foot clean fill buffer in any uncapped/ landscaped areas

Figure 4 shows the typical design and location of each remedial cover type used on this Site.

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 SMP. A Soil Management Plan will be included in the Site Management Plan and will outline the procedures to be followed in the event that the composite cover system and underlying residual soil/fill is disturbed after the remedial action is complete. Maintenance of this composite cover system will be described in the Site Management Plan in the RAR.

4.3.2 Vapor Barrier

Migration of soil vapor will be mitigated with a combination of building slab and vapor barrier. The barrier will consist of Stego™ 20-mil vapor barrier or equivalent vapor barrier or waterproofing membrane that meets or exceeds ASTM's E-1745 standard for installation of a vapor barrier between granular fill and concrete. The barrier will be installed in accordance with the manufacturer's specifications, including those for sealing penetrations through the foundations. Proof of installation of the barrier will be included in the Professional Engineer (P.E.) certified Remedial Action Report discussed in Section 6.0. The barrier specifications are provided in Appendix 5. The barrier system is a permanent engineering control for the Site.

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 manufacturer's certificate of warranty.

4.3.3 Sub-Slab Depressurization System

Migration of soil vapor will be further mitigated with the construction of an active sub-slab depressurization system (SSDS), which may be converted to a passive system prior to completion of construction, as outlined below. The SSDS system will consist of a layer of permeable gravel beneath the vapor barrier, with embedded perforated pipes. A riser pipe will extend from the sub-slab vapor collection components to above the structure roof. On the roof, a vapor mitigation fan connected to the riser pipe will be utilized to create a vacuum for this Site. The SSDS will be designed in accordance with the New York City Building Code and the New York State Department of Health October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York. The design diagrams and specifications for the vapor barrier and SSDS are provided in Appendix 5.

Two soil vapor points will be incorporated into the foundation slab. The soil vapor points

will be constructed in accordance with the New York State Department of Health October 2006 Guidance for Evaluating Soil Vapor Intrusion in the State of New York. Sub-slab soil vapor samples will be collected from the permanent soil vapor points upon completion of the foundation slab. The samples will be collected using a six-liter Summa Canister that will be set to restrict the sample collection to not exceed 0.2 liters per minute over a 24-hour period. The samples will be analyzed for EPA Method TO-15 using an ELAP certified laboratory. The analytical data will be used to determine if the active SSDS design can be converted into a passive SSDS.

4.4 Institutional Controls

Institutional Controls (IC) have been incorporated in this remedial action to manage residual soil/fill and other media and render the Site protective of public health and the environment. Institutional Controls are listed below. Long-term employment of EC/ICs will be implemented under a site-specific Site Management Plan (SMP) that will be included in the RAR.

Institutional Controls for this remedial action are:

- The property will continue to be registered with an E-Designation at the NYC Buildings Department. This RAWP includes a description of all ECs and ICs and summarizes the requirements of the Site Management Plan which will note that the property owner and property owner's successors and assigns must comply with the approved SMP;

- Submittal of a Site Management Plan in the RAR for approval by OER that provides procedures for appropriate operation,, monitoring, inspection, and certification of ECs and ICs. The SMP will require that the property owner and property owner's successors and assigns will submit to OER a periodic written statement that certifies that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by OER; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. OER retains the right to enter the Site in order to evaluate the continued maintenance of any controls. This certification shall be submitted at a frequency to be determine by OER in the SMP and will comply with RCNY §43-1407(l)(3).

- Vegetable gardens and farming on the Site are prohibited in contact with residual soil materials;
- Use of groundwater underlying the Site is prohibited without treatment rendering it safe for its intended use;
- All future activities on the Site that will disturb residual material must be conducted pursuant to the soil management provisions in an approved SMP;
- The Site will be used for 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 ECs and ICs; (2) implementation of monitoring programs; (3) operation and maintenance of ECs; (4) inspection and certification of ECs; and (5) reporting.

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

4.6 Qualitative Human Health Exposure Assessment

The objective of the qualitative exposure assessment is to identify potential receptors and pathways for human exposure to the contaminants of concern (COC) that are present at, or migrating from, the Site. The identification of exposure pathways describes the route that the COC takes to travel from the source to the receptor. An identified pathway indicates that the

potential for exposure exists; it does not imply that exposures actually occur.

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

4.6.1 Known and Potential Sources

Site inspections and subsurface investigations (including a Phase I ESA and a Remedial Investigation) have been performed at the Site and nearby to identify Areas of Concern (AOCs). The AOCs identified by investigations conducted at the Site include:

1. The subject property has been occupied by a funeral home since as early as 1941. On-Site operations on the ground floor used embalming chemicals consisting of a variety of preservatives, sanitizers, and disinfecting agents, including formaldehyde, glutaraldehyde, methanol, and ethanol;
2. The two subject property basements were each equipped with one 275-gallon #2 fuel oil aboveground storage tank (AST). Staining and odor indicative of heating oil was noted on the earthen floor in the basement beneath the western basement's AST;
3. The subject property was listed by city directories as a dry cleaning facility in 1949 and 1960 and the adjacent property as the same facility in 1960 and 1976. Interviews indicated that the dry cleaning facility was not on-site, and the property to the east was a drop-off only dry cleaner. No evidence of on-site dry cleaning was observed;
4. Based on the age of the subject property, there was a potential that asbestos-containing materials (ACMs) and lead-based paint (LBP) are present. These materials are expected to be addressed as part of demolition in accordance with applicable Federal, state and local regulations and are not discussed herein.

Historic fill material is present at the property from grade to approximately 10 feet below grade. Based on the results of the RIR, the contaminants of concern are:

<u>Soil</u>

- SVOCs: including benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1, 2, 3-cd)pyrene exceeding Restricted Residential SCOs.
- Metals including lead and mercury exceeding Unrestricted Use.

- Pesticides were identified but did not exceed Restricted Residential SCOs.

Groundwater

- Groundwater will be investigated after building demolition.

Soil Gas

- The chlorinated VOC, TCE was detected in one soil vapor sample at a concentration exceeding NYSDOH Soil Vapor Intrusion Guidance Air Guideline Values.

4.6.2 Nature, Extent, Fate and Transport of Contaminants

SVOCs, metals and pesticides are present within the historic fill at the Site. These contaminants are constituents associated with the historic fill material that was used to fill the land for previous development purposes and is present at varying depths throughout the Site. Petroleum and chlorinated VOCs were detected in the soil gas. The chlorinated VOC TCE was detected in one soil vapor sample at a concentration exceeding NYSDOH Soil Vapor Intrusion Guidance Air Guideline Values. Groundwater will be investigated after building demolition and prior to site redevelopment.

4.6.3 Potential Routes of Exposure

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

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

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

These routes of exposure are possible before, during and after the remedial action if proper precautions are not taken. The remedial plan outlined in this RAWP will ensure that routes of exposure are prevented during the development of the Site.

4.6.4 Existence of Human Health Exposure

Current Conditions: The potential for exposure to surficial historic fill exists under current conditions but is limited due to building slabs across much of the site. Currently, there are minimal potential migration pathways for absorption, ingestion, and inhalation for soil, and absorption and ingesting for groundwater since the majority of Site soils are covered by the building slabs and the depth to groundwater is approximately 60 feet below grade. However, uncapped landscaped areas are present along the northern portions of each of the site lots. The buildings at the Site are currently locked and secure.

Construction/Remediation Activities: The work performed at the Site will include excavation of soil/fill material and general construction activities, and has the potential to affect the on-site construction/remediation workers and the off-site local population. Once redevelopment activities begin, construction workers will come into direct contact with surface and subsurface soils. On-Site construction workers potentially could ingest, inhale or have dermal contact with any exposed impacted soil, and fill. Similarly, off-Site receptors could be exposed to dust and vapors from on-Site activities. During construction, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through the Soil/Materials Management Plan, dust controls, and through the implementation of the Community Air-Monitoring Program and a Construction Health and Safety Plan.

Proposed Future Conditions: Upon the completion of remediation and construction activities, there will be no exposures because contaminants exceeding Track 4 SCOs will be removed from the Site to the extent practical and the Site will be covered by an engineered composite cover, vapor barrier, and SSDS as part of development, and an SMP will address long-term management of residual contamination. The Site will be fully capped, limiting potential direct exposure to soil and groundwater remaining in place, and a vapor barrier system will prevent any exposure to potential off site soil vapors in the future. The Site is served by a public water 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.

4.6.5 Receptor Populations

On-Site Receptors – The receptors identified under current conditions include on-site workers and visitors to the funeral home. During redevelopment of the Site, the on-Site potential

receptors will include construction workers, site representatives, and visitors. Once the Site is redeveloped, the on-Site potential sensitive receptors will include adult and child building residents, workers and visitors.

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

1. Commercial Businesses – existing and future
2. Residential Buildings – existing and future
3. Building Construction/Renovation – existing and future
4. Pedestrians and Trespassers – existing and future

4.6.6 Overall Human Health Exposure Assessment

There are potential complete exposure pathways present during the current unremediated conditions. There is a potential complete exposure pathway that requires mitigation during implementation of the remedy. There is no complete exposure pathway under future conditions after the Site is developed. This assessment takes into consideration the reasonably anticipated use of the Site, which includes a residential structure, Site-wide impervious surface cover cap, SSDS, and a subsurface vapor barrier system for the building. 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.

Exposure of both on-site workers and the off-site local population to Site contaminated media (soil and soil vapor) has the greatest potential during the remedial and construction work. In order to mitigate possible exposure levels, a Construction Health and Safety Plan (CHASP) will be implemented during construction and remedial work for the safety of the on-site workers and off-site local population. Other measures include conducting a community air monitoring programs (CAMP) for dust and VOCs to track on-site and off-site conditions, requiring personal protective equipment, provisions for upgrading the level of personal protective equipment when needed, applying dust and vapor suppression measures, requiring truck inspection and washing prior to departure from the Site, and stormwater controls will be employed.

5.0 REMEDIAL ACTION MANAGEMENT

5.1 Project Organization and Oversight

Principal personnel who will participate in the remedial action include: in

Marc Godick	AKRF Principal and Qualified Environmental Professional
Kate Brunner	AKRF Project Manager
Ashutosh Sharma	AKRF Field Team Leader and Site Safety Officer

The Professional Engineer (PE) for this project is Michelle Lapin (New York State Professional Engineer #073934-1).

5.2 Site Security

Site access will be controlled by construction fencing with gated entrances to the fenced Site. Barriers will be installed as needed to delineate and restrict access to the work areas. If there are any work areas of limited size, barrier tape will be sufficient to delineate and restrict access.

5.3 Work Hours

The hours for operation of remedial construction will be from 7 am to 5 pm. These hours conform to the New York City Department of Buildings (DOB) construction code requirements or according to specific variances issued by DOB.

5.4 Construction Health and Safety Plan

The Health and Safety Plan is included in Appendix 5. The Site Safety Coordinator will be Ashutosh Sharma. 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. Periodic roving monitoring will be performed for all ground intrusive activities and during the handling of contaminated or potentially contaminated media. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pit excavation or trenching, and the installation of soil borings or monitoring wells.

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

5.5.1 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) 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.

5.5.2 Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored periodically 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

5.7.1 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.

5.7.2 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.

5.7.3 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.

5.7.4 Equipment and Material Staging

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

5.7.5 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.

5.7.6 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.

5.7.7 Extreme Storm Preparedness and Response Contingency Plan

Damage from flooding or storm surge can include dislocation of soil and stockpiled materials, dislocation of Site structures and construction materials and equipment, and dislocation of support of excavation structures. Damage from wind during an extreme storm event can create unsafe or unstable structures, damage safety structures and cause downed power lines creating dangerous Site conditions and loss of power. In the event of emergency conditions caused by an extreme storm event, the enrollee will undertake the following steps for site preparedness prior to the event and response after the event.

5.7.8 Storm Preparedness

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

5.7.9 Storm Response

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

professional will determine the nature and extent of the spill and report to NYS DEC's spill hotline at DEC 800-457-7362. If the source of the spill is ongoing and can be identified, it should be stopped it this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYS DEC.

5.7.10 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 to turn right out of the southern portion of the Site onto Fulton Street. Turn right onto Flatbush Avenue and turn right onto Tillary Street. Proceed to the Brooklyn-Queens Expressway to disposal facilities located in New Jersey.

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

5.10.1 Daily Reports

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

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

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

5.10.2 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, required certifications, manifests and other written and photographic documentation of remedial work performed under this remedy;
- Site Management Plan (if Track 1 is not achieved);
- Description of any changes in the remedial action from the elements provided in this RAWP and associated design documents;

- Tabular summary of all end point sampling results and all material characterization results, QA/QC results for end-point sampling, and other sampling and chemical analysis performed as part of the remedial action and DUSR;
- Test results or other evidence demonstrating that remedial systems are functioning properly;
- Account of the source area locations and characteristics of all contaminated material removed from the Site including a map showing source areas;
- Account of the disposal destination of all contaminated material removed from the Site. Documentation associated with disposal of all material will include transportation and disposal records, and letters approving receipt of the material.
- Account of the origin and required chemical quality testing for material imported onto the Site.
- Continued registration of the property with an E-Designation at the NYC Department of Buildings.
- Reports and supporting material will be submitted in digital form.

6.1 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, Michelle Lapin, am currently a professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for 1041-1047 Fulton Street, Brooklyn, NY project, Site number 13EHN319K.

I, Marc Godick, am a qualified Environmental Professional. I had primary direct responsibility for implementation remedial program for the 1041-1047 Fulton Street, Brooklyn, NY project, Site 13EHN319K.

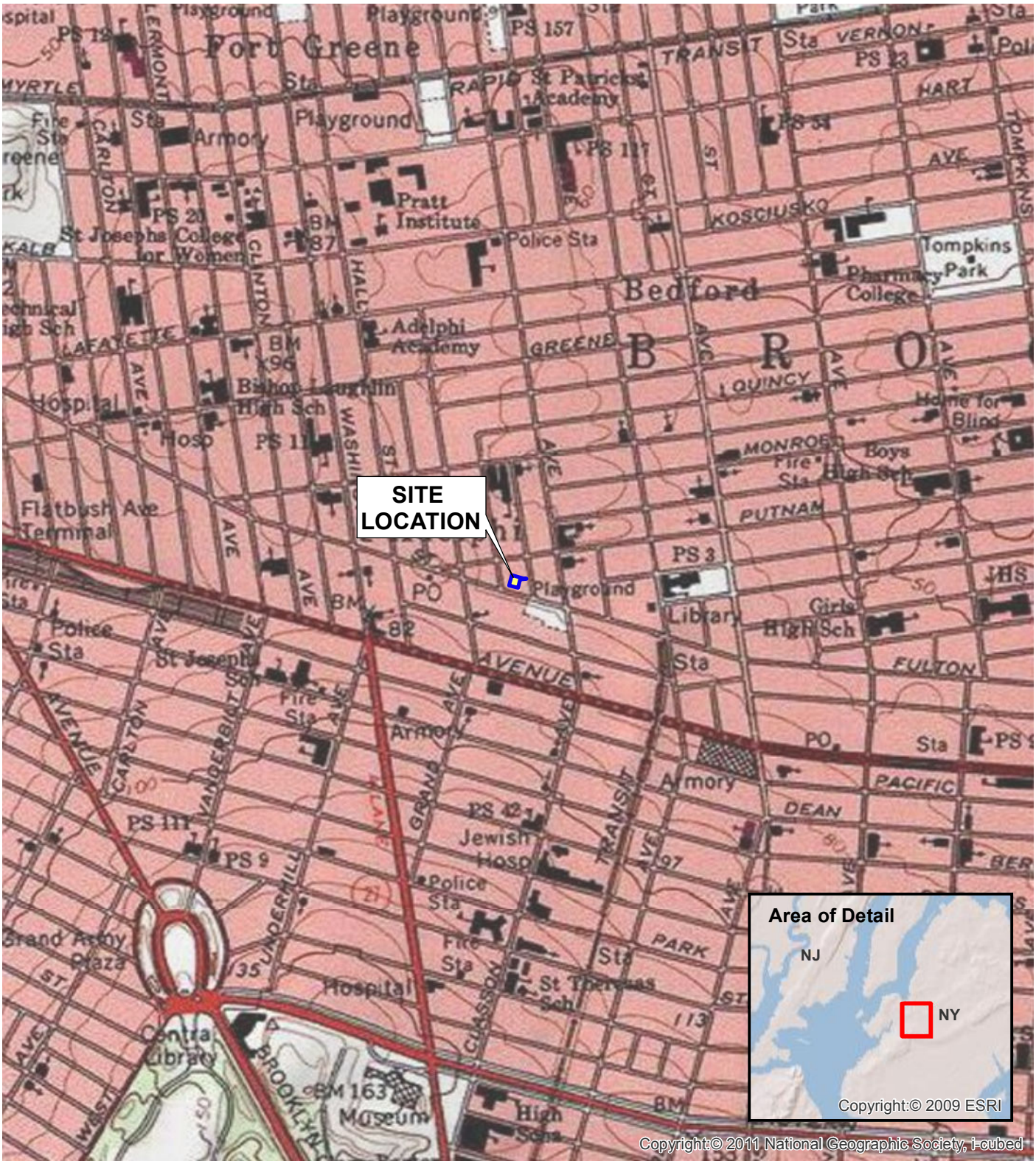
I certify that the OER-approved Remedial Action Work Plan dated September 2013 [and Stipulations in a letter dated month day, year; if any] were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

7.0 SCHEDULE

The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER. Currently, an approximately eight-month construction 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	4	2
Demolition	6	4
Remedial/Construction Excavation	10	20
Demobilization (for remedial excavation)	30	2
Submit Remedial Action Report	TBD	TBD

FIGURES



SOURCE
USGS 7.5 Minute Topographic Map
BROOKLYN Quad 1995

0 1,000 2,000 Feet

1041 - 1047 Fulton Street
Brooklyn, New York

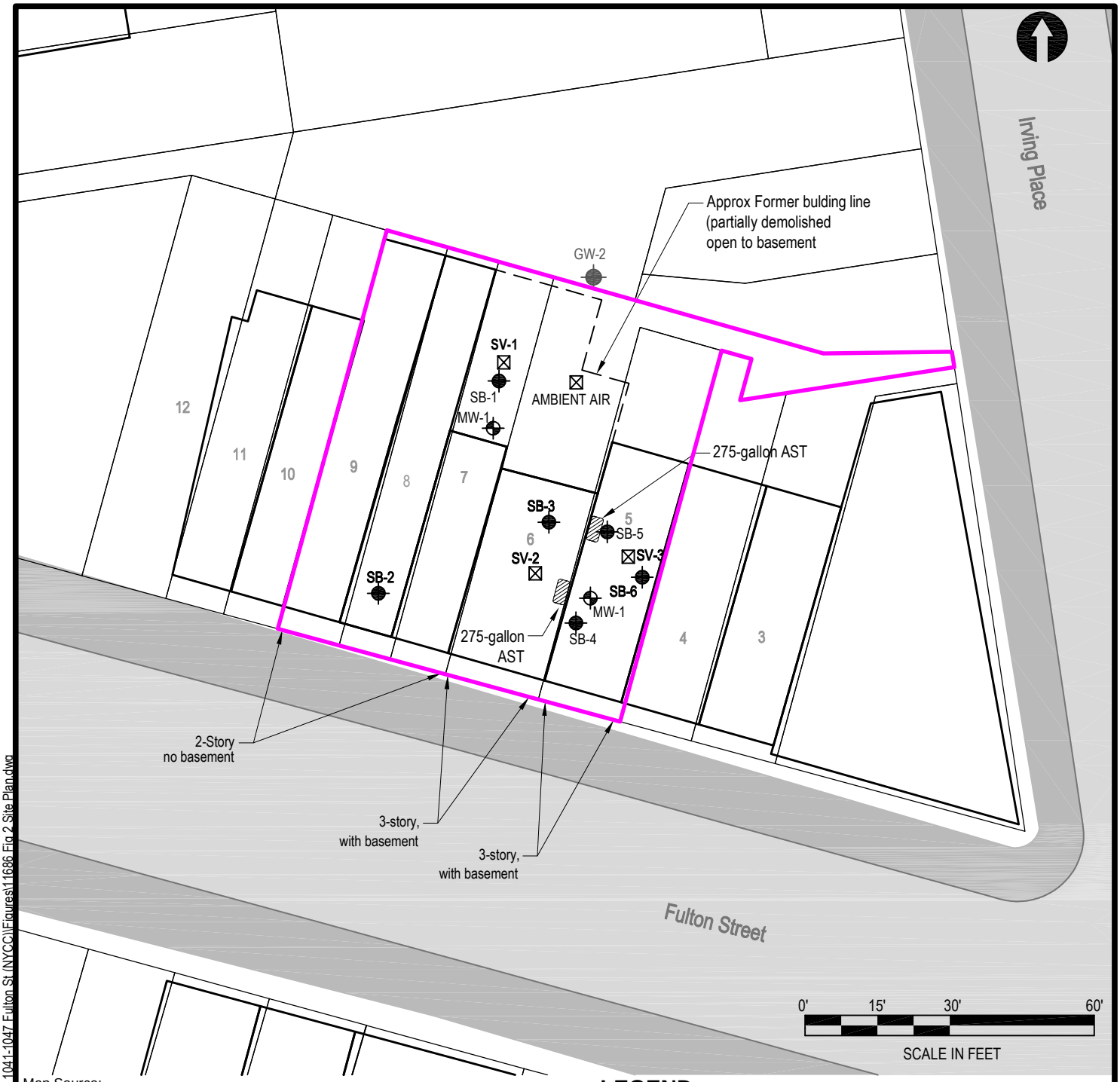
SITE LOCATION

AKRF
Environmental Consultants
440 Park Avenue South, New York, N.Y. 10016

DATE
2/13/2013

PROJECT No.
11686

FIGURE
1



Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

LEGEND:

- PROJECT SITE BOUNDARY
- LOT LINE
- BUILDING LINE
- 6 TAX LOT NUMBER
- SB-2 SOIL BORING LOCATION (AKRF)
- SV-3 SOIL VAPOR BORING (AKRF)
- GW-2 OFF-SITE TEMPORARY GROUNDWATER MONITORING WELL LOCATION (POSILLICO)
- MW-1 PROPOSED SOIL BORING/ MONITORING WELL LOCATION (GEOTECH)

1041-1047 Fulton Street

Brooklyn, New York

SITE PLAN

AKRF
Environmental Consultants
440 Park Avenue South, New York, N.Y. 10016

DATE 7.23.2013
PROJECT No. 11686
SCALE as shown
FIGURE 2

LEGEND:

- PAVED AREA
- EXCAVATION TO 10' BELOW GRADE
- EXCAVATION TO 15' BELOW GRADE
- PROJECT SITE BOUNDARY
- BUILDING LINE

0' 5' 10' 20'

SCALE IN FEET

AKRF
Environmental Consultants
440 Park Avenue South, New York, NY 10016

1041-1047 Fulton Street
Brooklyn, New York

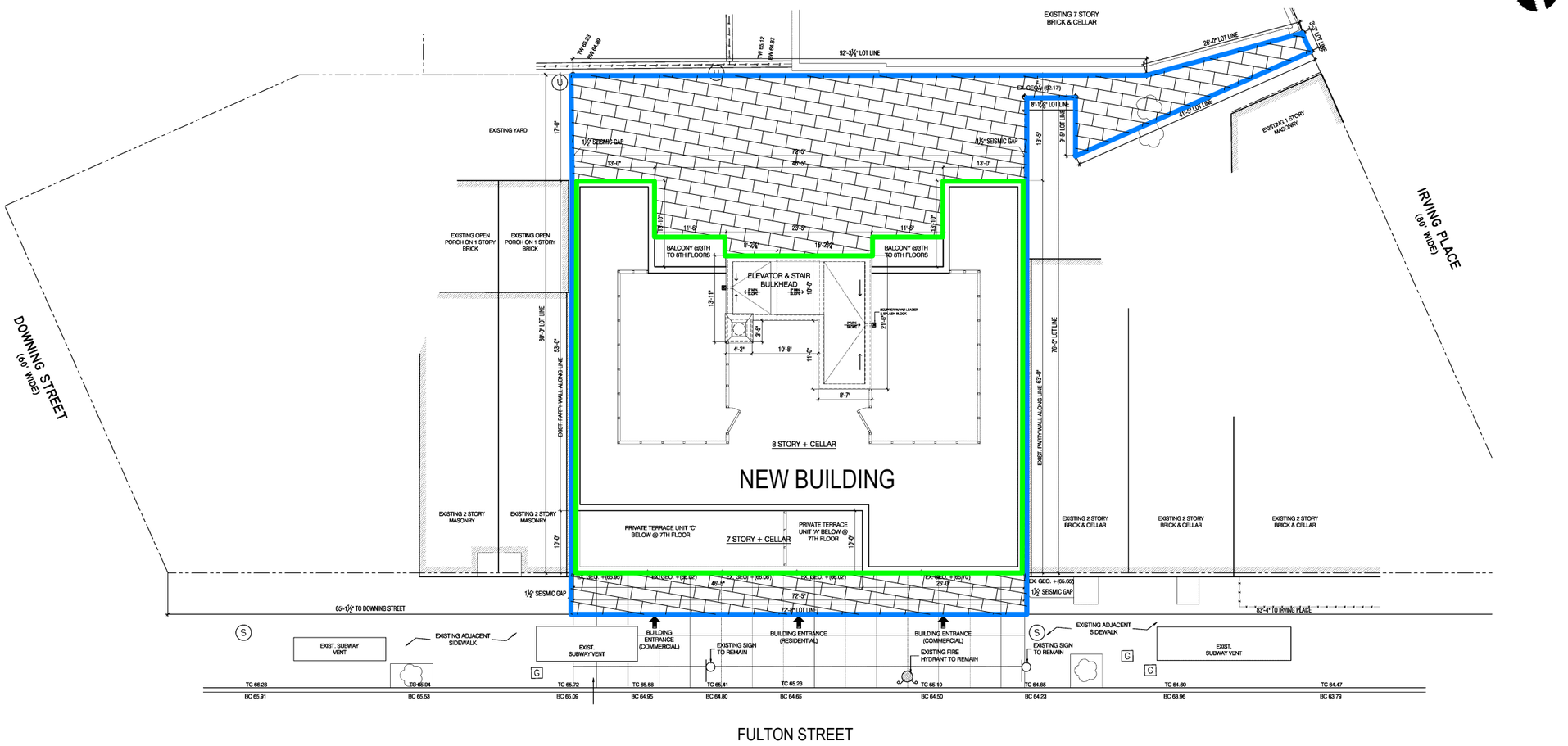
PROPOSED EXCAVATION PLAN

DATE
7.19.2013

PROJECT NO.
11686

SCALE
as shown

FIGURE
3



LEGEND:

- PAVED AREA
- PROJECT SITE BOUNDARY
- BUILDING LINE

0' 10' 20' 40'

SCALE IN FEET

AKRF
Environmental Consultants
440 Park Avenue South, New York, NY 10016

1041-1047 Fulton Street
Brooklyn, New York

PROPOSED COMPOSITE COVER SYSTEM DESIGN

DATE
7.19.2013

PROJECT NO.
11686

SCALE
as shown

FIGURE
4

FULTON STREET

LEGEND:

- PAVED AREA
- EXCAVATION TO 10' BELOW GRADE
- EXCAVATION TO 15' BELOW GRADE
- PROJECT SITE BOUNDARY
- BUILDING LINE
- ⊗ PROPOSED ENDPOINT SAMPLE LOCATION

0' 5' 10' 20'

SCALE IN FEET

AKRF
Environmental Consultants
440 Park Avenue South, New York, NY 10016

1041-1047 Fulton Street
Brooklyn, New York

PROPOSED EXCAVATION ENDPOINT SOIL SAMPLE LOCATIONS

DATE
7.19.2013

PROJECT NO.
11686

SCALE
as shown

FIGURE
5

APPENDIX 1

PROPOSED DEVELOPMENT PLANS

MIXED-USE DEVELOPMENT

1045 FULTON STREET, BROOKLYN, NY 11238

COMMERCIAL/RESIDENTIAL

KEY PLAN

BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
1		06/28/13	ISSUED TO DOB

ISSUES/REVISIONS

MEP ENGINEER:

TSF ENGINEERING PC
200 Park Avenue South, Suite 1020, New York, NY 10003
Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:

SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:

20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
OAQ OAA 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

1045 FULTON STREET, BROOKLYN, NY 11238

drawing title

COVER SHEET

dob no

000000000

scale N.T.S.	project no. 13-06
date 03/2013	sheet no. -- OF
drawn	drawing no. T-001.00
checked KF	

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

DOB APPLICATIONS FILING NOTES:

1. ARCHITECTURAL WORK FILED UNDER NB APPLICATION #
2. STRUCTURAL WORK FILED UNDER NB APPLICATION #
3. PLUMBING & MECHANICAL SYSTEMS FILED UNDER NB APPLICATION #
4. SPRINKLER & STANDPIPE TO BE FILED UNDER NB APPLICATION #
5. FIRE ALARM SYSTEM FILED UNDER SEPARATE APPLICATION #
6. BUILDERS PAVEMENT PLAN FILED UNDER SEPARATE APPLICATION #
7. FIRE PROTECTION PLAN FILED UNDER SEPARATE APPLICATION #
8. FOUNDATION & EXCAVATION FILED UNDER SEPARATE APPLICATION #

SPECIAL INSPECTIONS (TR-1):

• FIRE ALARM TEST		BC 907, BC1704.13
• STRUCTURAL STEEL - WELDING		BC 1704.3.1
• STRUCTURAL STEEL - ERECTION & BOLTING		BC 1704.3.2, BC 1704.3.3
• CONCRETE - CAST-IN-PLACE		BC 1704.4
• MASONRY		BC 1704.5
• SOILS - SITE PREPARATION		BC 1704.7.1
• SOILS - FILL PLACEMENT & IN-PLACE DENSITY		BC 1704.7.2, BC 1704.7.3
• SOILS - INVESTIGATIONS (BORINGS/TEST PITS)	TR4	BC 1704.7.4
• WALL PANELS, CURTAIN WALLS, AND VENEERS		BC 1704.10
• MECHANICAL SYSTEMS		BC 1704.15
• STRUCTURAL SAFETY - STRUCTURAL STABILITY		BC 1704.19
• EXCAVATION - SHEETING, SHORING AND BRACING		BC 1704.19, BC 3304.4.1
• SOIL PERCOLATION TEST - DRYWELL		BC 1704.20.1
• SITE STORM DRAINAGE DISPOSAL AND DETENTION SYSTEM INSTALLATION		BC 1704.20
• SPRINKLER SYSTEMS		BC 1704.21
• STANDPIPE SYSTEMS		BC 1704.22
• CHIMNEYS		BC 1704.24
• FIRESTOP, DRAFTSTOP AND FIREBLOCK SYSTEMS		BC 1704.25
• CONCRETE TEST CYLINDERS	TR2	BC 1905.6
• CONCRETE DESIGN MIX	TR3	BC 1905.3
• FOOTING AND FOUNDATION		BC 109.3.1
• FRAME INSPECTION		BC109.3.3
• ENERGY CODE COMPLIANCE INSPECTIONS	TR8	BC 109.3.5
• FIRE-RESISTANCE RATED CONSTRUCTION		BC 109.3.4

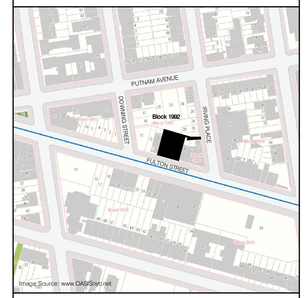
SPECIAL INSPECTIONS (TR-8):

• 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
• VESTIBULES	IIA9
• DAMPERS INTEGRAL TO BUILDING ENVELOPE	IB2, IIB2
• HVAC AND SERVICE WATER HEATING EQUIPMENT	IB3, IIB3
• HVAC AND SERVICE WATER HEATING SYSTEM CONTROLS	IB4, IIB4
• DUCT PLENUM AND PIPING INSULATION AND SEALING	IB5, IIB5
• DUCT LEAKAGE TESTING	IB6, IIB6
• ELECTRICAL METERING	IC1, IIC1
• LIGHTING IN DWELLING UNITS	IC2, IIC2
• INTERIOR LIGHTING POWER	IIC3
• EXTERIOR LIGHTING POWER	IIC4
• LIGHTING CONTROL	IIC5
• EXIT SIGNS	IIC6
• ELECTRICAL MOTORS	IIC8

PLAN SYMBOLS - LEGEND

GYPSUM BOARD WALL (GWB) NOT FIRE RATED SEE WALL TYPES	E EXIT SIGN E EXIT SIGN W/ DIRECTION	BATHROOM MECH. VENTILATION	X/X WINDOW TAG XX/XXX DETAIL NUMBER / ENLARGE DETAIL / SHEET NUMBER
1 HR. FIRE RATED WALL SEE WALL TYPES	REVISED AREA & REVISION NUMBER	HB NON-FREEZE WALL HOSE BIB "RECESSED"	X DOOR TAG XX/XXX ELEVATION NUMBER / BUILDING ELEVATION / SHEET NUMBER
2 HR. FIRE RATED WALL SEE WALL TYPES	SD COMBINATION SMOKE & CARBON MONOXIDE DETECTOR: HARDWIRED SMOKE & CARBON MONOXIDE DETECTORS SHALL COMPLY WITH NYCBC 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		X WALL TAG XX/XXX SECTION NUMBER / BUILDING SECTION / SHEET NUMBER
3 HR. FIRE RATED WALL SEE WALL TYPES			RAP FIRE ALARM REMOTE ANNUNCIATOR PANEL
C.M.U. WALL SEE WALL TYPES FOR FIRE RATING			F FIRE ALARM MANUAL PULL STATION XX/XXX SECTION NUMBER / DETAIL SECTION / SHEET NUMBER
POURED IN PLACE CONCRETE WALL REFER TO STRUCTURAL DRAWINGS	S/e SMOKE DETECTOR: "e" DENOTES ELEVATOR RECALL		FAP FIRE ALARM PANEL EP ELECTRIC PANEL
FUTURE OUTWARD DOOR SWING OF ADAPTABLE BATHROOM ONCE THE DWELLING UNIT IS OCCUPIED BY PERSON W/ PHYSICAL DISABILITY	T.D. = X'-X" / MAX. = X'-X" ACTUAL T.D. (TRAVEL DISTANCE) / MAX. T.D. (TRAVEL DISTANCE) ALLOWED		CO CARBON MONOXIDE SENSOR H HEAT DETECTOR

KEY PLAN



BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
1		06/28/13	ISSUED TO DOB

ISSUES/REVISIONS

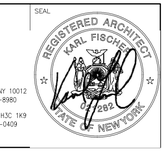
MEP ENGINEER:
TSF ENGINEERING PC
200 Park Avenue South, Suite 1020, New York, NY 10003
Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
OAQ QAA 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
1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
GENERAL NOTES & LEGENDS

dob no.
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scale: NONE	project no.: 13-06
date: 03/2013	sheet no.: -- OF
drawn:	drawing no.: T-003.00
checked: KF	

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 CONTRACTOR'S 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.

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 STRUCTURAL MEMBERS, 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 714.3.
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 711.
15. THROUGH PENETRATIONS AND MEMBRANE PENETRATIONS OF FIRE RATED CONSTUCTION SHALL COMPLY WITH THE REGULATIONS SET FORTH IN SECTION BC 712, 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 2008 NYC BUILDING CODE.

TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS[a]
Height limitations shown as stories and feet above grade plane.
Area limitations as determined by the definition of "Area, building," per floor.

		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
	Hgt (feet)	UL	160[e]	65	55	65	55	65	50	40
GROUP	Hgt(S)									
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	6	3	2
	A	UL	UL	26,000	10,500	23,500	5,600	25,500	8,400	5,500
F-1	S	UL	6	5	3	5	2	5	3	2
	A	UL	UL	12,500	7,500	7,500	3,000	10,000	3,000	1,000
F-2	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	7	5	3	5	3	5	3	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	4	3	4	NP	NP
	A	UL	UL	19,000	NP	16,500	5,600	18,000	NP	NP
I-2	S	UL	6	4	4	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	25,500	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	6	NP	6	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	UL	48,000	12,000	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[c]	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 m^2.
UL = Unlimited, NP = Not permitted.
Not permitted in Fire District
Not permitted in Fire District without sprinklers
a. See the following sections for general exceptions to Table 503:
1. Section 504.2, Allowable height increase due to automatic sprinkler system installation.
2. Section 506.2, Allowable area increase due to frontage.
3. Section 506.3, Allowable area increase due to automatic sprinkler system installation.
4. Section 507, Unlimited area building.
b. For open parking structures, see Section 406.3.
c. For private garages, see Section 406.1.
d. See Section 415.5 for limitations.
e. Except for Occupancy Groups F-1, H-1 through H-5, I-2, I-3, S-1 and U, buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 shall be unlimited in height.

20. REQUIRED SEPARATION OF OCCUPANCIES (HOURS)TABLE 508.3.3 OF 2008 NYC BUILDING CODE.

TABLE 508.3.3
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)[a]

USE	A-1	A-2	A-3	A-4	A-5	B[b]	E	F-1	F-2	H-1	H-2	H-3	H-4	H-5	I-1	I-2	I-3	I-4	M[b]	R-1	R-2	R-3	S-1	S-2	U
A-1	—	2	2	2	2	2	2	3	2	NP	4	3	2	4	2	2	2	2	2	2	2	2	3	2	1
A-2[e]	—	—	2	2	2	2	2	3	2	NP	4	3	2	4	2	2	2	2	2	2	2	2	3	2	1
A-3	—	—	—	2	2	2	2	3	2	NP	4	3	2	4	2	2	2	2	2	2	2	2	3	2	1
A-4	—	—	—	—	2	2	2	3	2	NP	4	3	2	4	2	2	2	2	2	2	2	2	3	2	1
A-5	—	—	—	—	—	2	2	3	2	NP	4	3	2	4	2	2	2	2	2	2	2	2	3	2	1
B[b]	—	—	—	—	—	—	2	3	2	NP	2	1	1	1	2	2	2	2	2	2	2	2	3	2	1
E	—	—	—	—	—	—	—	3	2	NP	4	3	2	3	2	2	2	2	2	2	2	2	3	2	1
F-1	—	—	—	—	—	—	—	—	3	NP	2	1	1	1	3	3	3	3	3	3	3	3	3	3	3
F-2	—	—	—	—	—	—	—	—	—	NP	2	1	1	1	2	2	2	2	2	2	2	2	3	2	1
H-1	—	—	—	—	—	—	—	—	—	—	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
H-2	—	—	—	—	—	—	—	—	—	—	—	1	2	2	4	4	4	4	2	4	4	4	2	2	1
H-3	—	—	—	—	—	—	—	—	—	—	—	—	1	1	4	3	3	3	1	3	3	3	1	1	1
H-4	—	—	—	—	—	—	—	—	—	—	—	—	—	1	4	4	4	4	1	4	4	4	1	1	1
H-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4	4	3	1	4	4	4	1	1	3
I-1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	2	2	2	2	4	3	2
I-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	2	2	2	3	2	1
I-3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	2	2	3	2	1
I-4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	2	3	2	1
M[b]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	3	2	1
R-1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	3	2	1
R-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	3	2	1
R-3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	2[d]	1[d]
S-1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	3
S-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

For SI: 1 square foot = 0.0929 m^2.
NP = Not Permitted.
a. See Section 508.3.3.4 for reductions permitted.
b. Occupancy separation need not be provided for storage areas serving Group B or M if any of the following conditions apply:
1. The storage area is less than 10 percent of the floor area of the story and less than 3000 square feet (278.7 m^2).
2. The storage area is provided with an automatic fire-extinguishing system and is less than 3,000 square feet (278.7 m^2); or
3. The storage area is less than 1,000 square feet (92.9 m^2).
c. Reserved.
d. For private garages and carports, see Section 406.1.4.
e. Commercial kitchens need not be separated from the restaurant seating areas that they serve, provided:
1. The cooking equipment is vented directly to the outdoors; and
2. A draft curtain of noncombustible materials, at least 24 inches (610 mm) down from the ceiling, is provided to separate the cooking facilities from the restaurant seating areas; and
3. Sprinkler heads constructed in accordance with the provisions of this code are provided in the kitchen side of the curtain, within 24 inches (610 mm) of the curtain opening, and any other openings including doors between the kitchen and the seating areas, and spaced not more than 48 inches (1210 mm) on center for each opening that is more than 60 inches (1524 mm) wide.

21. FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS) TABLE 601 OF 2008 NYC BUILDING CODE.

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

	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V[i]	
BUILDING ELEMENT	A	B	A[d]	B	A[d]	B	HT	A[d]	B
Structural frame[a] Including columns, girders, trusses	3[b]	2[b]	1	0	1	0	HT	1	0
Bearing walls Exterior[f,g] Interior	3 3[b]	2 2[b]	1 1	0 0	2 1	2 0	2 1/HT	1 1	0 0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior[e]	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor construction[h] Including supporting beams and joists	2	2	1	0	1	0	HT	1	0
Roof construction Including supporting beams and joists	1 1/2[c]	1[c]	1[c]	0[c]	1[c]	0	HT	1[c]	0

For SI: 1 foot = 304.8 mm.
a. The structural frame shall be considered to be the columns and the girders, beams, trusses and spandrels having direct connections to the columns and bracing members designed to carry gravity loads. The members of floor or roof panels which have no connection to the columns shall be considered secondary members and not a part of the structural frame.
b. Roof supports: Fire-resistance ratings of structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
c. 1. Except in Factory-Industrial (F-1), Hazardous (H), Mercantile (M) and Moderate-Hazard Storage (S-1) occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
2. Except in Factory-Industrial (F) occupancies subject to regulation under Sections 264(1) and 264(2) of the *New York State Labor Law*, and in Group I-1, R-1, and Group R-2 occupancies, in all occupancies heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.
3. Except in Factory-Industrial (F) occupancies subject to regulation under Sections 264(1) and 264(2) of the *New York State Labor Law*, and in Group I-1, R-1, and Group R-2 occupancies, in Type I and II construction, fire-retardant –treated wood shall be allowed in buildings including girders and trusses as part of the roof construction when the building is:
i. Type II construction of any height; or
ii. Type I construction two stories or less; or when over two stories, the vertical distance from the upper floor to the roof is 20 feet or more.
d. An approved automatic sprinkler system in accordance with Section 903.3.1.1 shall be allowed to be substituted for 1-hour fire-resistance-rated construction, provided such system is not otherwise required by other provisions of the code or used for an allowable area increase in accordance with Section 506.3 or an allowable height increase in accordance with Section 504.2. The 1-hour substitution for the fire resistance of exterior walls shall not be permitted.
e. Not less than the fire-resistance rating required by other sections of this code.
f. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
g. See footnote (d) of Table 602.
h. See Section 711.3 for additional requirements.
i. Type V construction is not permitted inside fire districts except as provided for in Section D105.1 of Appendix D.

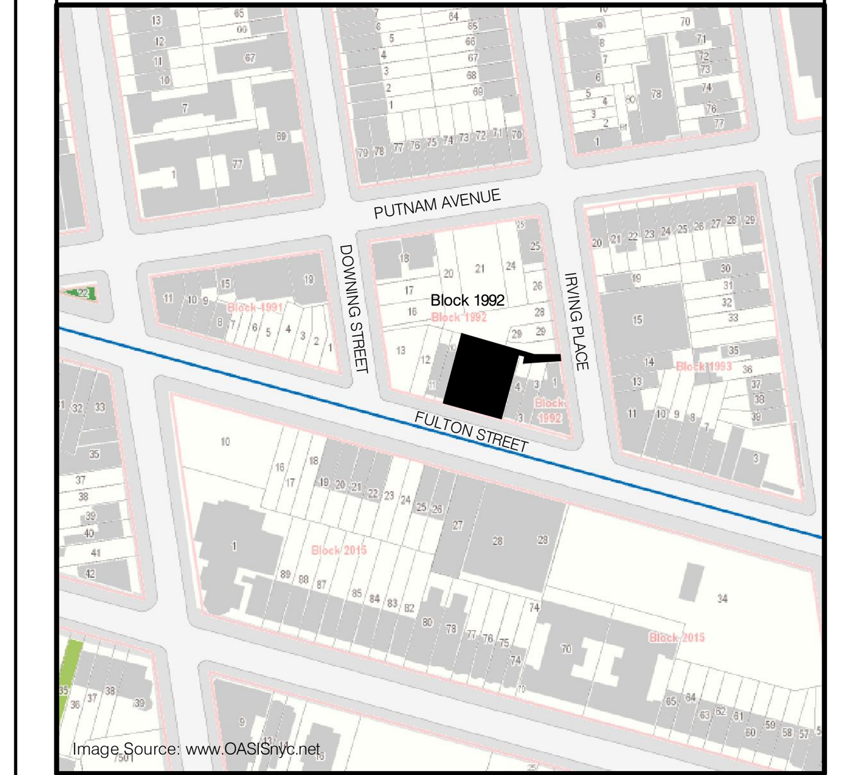
22. FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATOIN DISTANCE TABLE 602 OF 2008 NYC BUILDING CODE.

TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE[a, d, e]

FIRE SEPARATION DISTANCE (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H	OCCUPANCY GROUP F-1, M, S-1	OCCUPANCY GROUP A, B, E, F-2, I, R[b], S-2, U
< 5[c]	All	3	2	1
≥ 5 to < 10	IA Others	3 2	2 1	1 1
≥ 10 to < 30	IA, IB IIB, VB Others	2 1 1	1 0 1	1 0 1
≥ 30	All	0	0	0

For SI: 1 foot = 304.8 mm.
a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
b. Group R-3 and Group U when used as accessory to Group R-3, shall not be required to have a fire-resistance rating where the fire separation distance is 3 feet or more.
c. See Section 705.1.1 for party walls.
d. Inside the fire district, exterior load-bearing walls of Type II buildings shall have a fire-resistance rating not less than prescribed below:
< 5 — 2 hours
> (or equal) 5 and <10 — 2 hours
> (or equal) 10 < 30 — 1 hour
> (or equal) 30 — As per table 602.
e. Inside the fire district, exterior nonload-bearing walls of Type II buildings shall have a fire-resistance rating not less than prescribed below:
< 5 — As per Table 602
> (or equal) 5 and <10 — As per Table 602
> (or equal) 10 < 30 — 1 hour
> (or equal) 30 — As per Table 602.

KEY PLAN



BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
1		06/28/13	ISSUED TO DOB

ISSUES/REVISIONS

MEP ENGINEER:
TSF ENGINEERING PC
200 Park Avenue South, Suite 1020, New York, NY 10003
Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
OAQ OAA 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 021282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
GENERAL NOTES

dob no
000000000

scale	project no.
3/16" = 1'-0"	13-06
date 03/2013	sheet no. ---- OF
drawn	drawing no.
checked KF	G-001.00

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. 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 1009.4).
   - 3.3. THE MAXIMUM VERTICAL RISE OF A SINGLE FLIGHT OF STAIRS BETWEEN FLOORS IS NOT TO EXCEED 12' IN ALL OCCUPANCY GROUPS, EXCEPT GROUP A AND I OCCUPANCIES THE VERTICAL RISE IS NOT TO EXCEED 8' (BC 1009.6).
   - 3.4. 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 1009.3).
   - 3.5. HANDRAILS SHALL BE PROVIDED ON EACH SIDE, EXCEPT THAT AN ENCLOSED EXIT STAIRS LESS THAN 44" WIDE THAT DO NOT SERVE AS AN ACCESSIBLE MEANS OF EGRESS (BC 1009.11). 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 1009.11.1). INTERMEDIATE HANDRAILS ARE REQUIRED SO THAT ALL PORTIONS OF THE STAIRWAY WIDTH REQUIRED FOR EGRESS CAPACITY ARE WITHIN 30" OF A HANDRAIL (BC 1009.11.2). HANDRAIL SHALL PROVIDE 1-1/2" CLEAR SPACE BETWEEN A HANDRAIL AND A WALL, OR OTHER SURFACE (BC 1009.11.6).
4. THE MEANS OF EGRESS ILLUMINATION LEVEL SHALL NOT BE LESS THAN 2 FOOT-CANDLES AT THE FLOOR LEVEL IN EXITS, AT EXIT DISCHARGES, AND IN PUBLIC CORRIDORS, AND SHALL NOT BE LESS THAN 1 FOOT-CANDLE AT THE FLOOR LEVEL IN EXIT ACCESS COMPONENTS OTHER THAN PUBLIC CORRIDORS (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. THE INSTALLATION OF THE EMERGENCY POWER SYSTEM SHALL BE IN ACCORDANCE WITH SECTION BC 2702.
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 1019.1.7
8. ELEVATOR IDENTIFICATION AND EMERGENCY SIGNS SHALL BE PROVIDED IN ACCORDANCE WITH SECTION BC 3002.3.
9. 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.
10. PENETRATIONS INTO AND OPENINGS THROUGH AN EXIT ENCLOSURE ARE PROHIBITED EXCEPT FOR REQUIRED EXIT DOORS, EQUIPMENT AND DUCTWORK NECESSARY FOR INDEPENDENT PRESSURIZATION, 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 1019.1.2.
11. ALL EXITS SHALL BE KEPT READILY ACCESSIBLE AND UNOBSTRUCTED AT ALL TIMES.
12. MAXIMUM TRAVEL DISTANCE SHALL COMPLY WITH BC 1015: TABLE 1015.1.

TABLE 1015.1
EXIT ACCESS TRAVEL DISTANCE[a]

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A	See Section 1024.7	
E, F-1, I-1, M, R, S-1	150	200[b]
B	200	300[c]
F-2, S-2, U	200	250[b]
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-2, I-3, I-4	150	200[b]

For SI: 1 foot = 304.8 mm.
a. See the following sections for modifications to exit access travel distance requirements:
Section 402: For the distance limitation in malls.
Section 404: For the distance limitation through an atrium space.
Section 1018.2: For buildings with one exit.
Chapter 31: For the limitation in temporary structures.
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.
c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

13. MINIMUM NUMBER OF EXITS REQUIRED SHALL COMPLY WITH BC 1018: TABLE 1018.1
14. OCCUPANCY LOAD SHALL COMPLY WITH BC 1004: TABLE 1004.1.2.
15. 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: TABLE 1005.1.

TABLE 1005.1
EGRESS WIDTH PER OCCUPANT SERVED

OCCUPANCY	STAIRWAYS (inches per occupant)	OTHER COMPONENTS (inches per occupant)
Occupancies other than those listed below	0.3	0.2
Hazardous: H-1, H-2, H-3 and H-4	0.7	0.4

16. 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. & AREA OF RESCUE ASSISTANCE IS NOT REQUIRED AT EXIT STAIRWAYS 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 801.1).
2. INTERIOR WALL AND CEILING FINISHES SHALL BE CLASSIFIED IN ACCORDANCE WITH ASTM E84 AND SHALL BE USED IN ACCORDANCE WITH BC 803, TABLE 803.5.
3. SMOKE DEVELOPED INDEX SHALL COMPLY WITH BC 803.1.1.
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 803.2.2.
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.

SMOKE DETECTING DEVICES:

1. SMOKE DETECTING DEVICES SHALL CONFORM TO NEW YORK CITY BUILDING CODE SECTION BC 907.2.9.1.3 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 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. 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.

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:

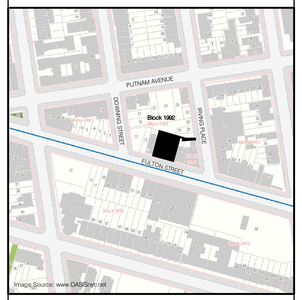
THE FOLLOWING ITEMS OF WORK SHALL BE SUBJECT TO CONTROLLED INSPECTION, MADE AND WITNESSED BY OR UNDER THE DIRECT SUPERVISION OF AN ARCHITECT OR ENGINEER, RETAINED BY THE OWNER AND ACCEPTABLE TO THE ARCHITECT OF RECORD. TEST REPORTS AND CERTIFICATE OF INSPECTION SHALL BE FILED WITH THE DEPARTMENT OF BUILDING.
SEE SHEET T-003 FOR COMPLETE LIST OF CONTROL INSPECTIONS.

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: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
1		06/28/13	ISSUED TO DOB

ISSUES/REVISIONS

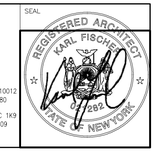
MEP ENGINEER:
TSF ENGINEERING PC
200 Park Avenue South, Suite 1020, New York, NY 10003
Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
OAQ OAA 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
1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
GENERAL NOTES

dob no
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scale: 3/16" = 1'-0"	project no.: 13-06
date: 03/2013	sheet no.: ---- OF
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

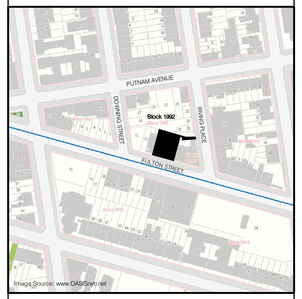
NEW YORK CITY DEPARTMENT OF HEALTH AND MENTAL HYGIENE
WINDOW GUARD REGULATIONS OF THE CITY OF NY 6-30-91: CHAPTER 12
§12-10: SPECIFICATIONS FOR WINDOW GUARD DOUBLE HUNG WINDOWS.

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 MANUFACTURER'S 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 ON 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 ON 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 MANUFACTURER'S 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 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 PIVOTING 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



BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
1		06/28/13	ISSUED TO DOB

ISSUES/REVISIONS

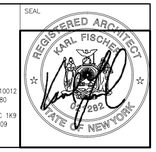
MEP ENGINEER:
TSF ENGINEERING PC
200 Park Avenue South, Suite 1020, New York, NY 10003
Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
OAQ OAA 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
1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
GENERAL NOTES

dob no
000000000

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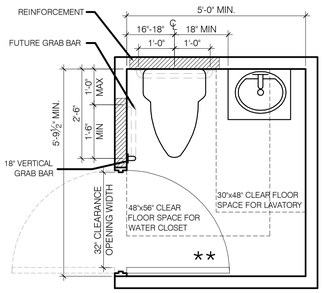
date: 03/2013	sheet no.: ---- OF
drawn:	drawing no.: G-003.00
checked: KF	



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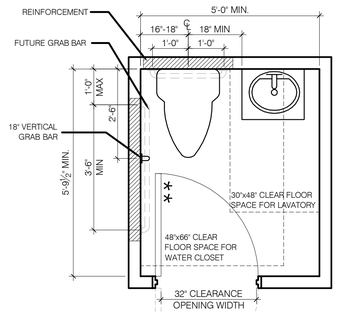

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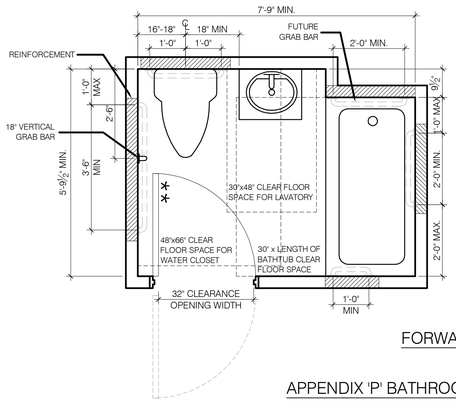
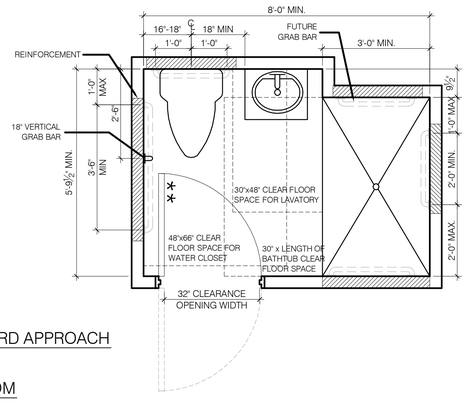


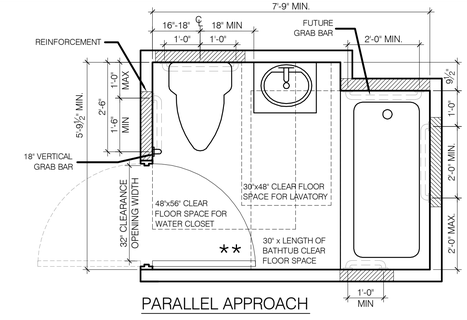


FORWARD APPROACH

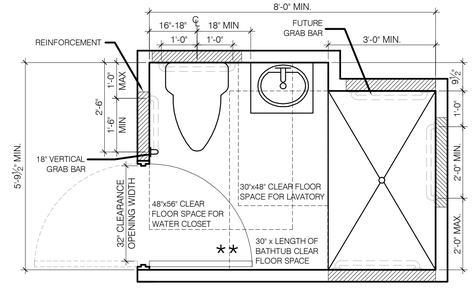
APPENDIX 'P' BATHROOM

** 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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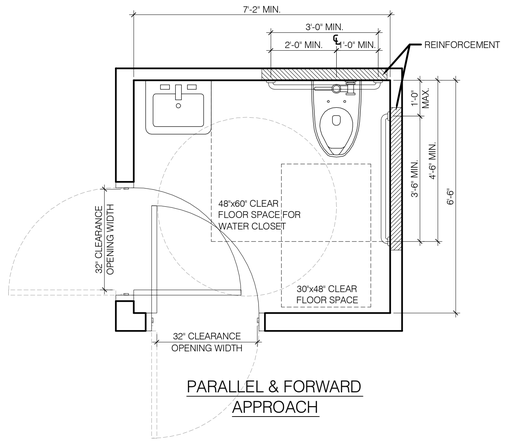
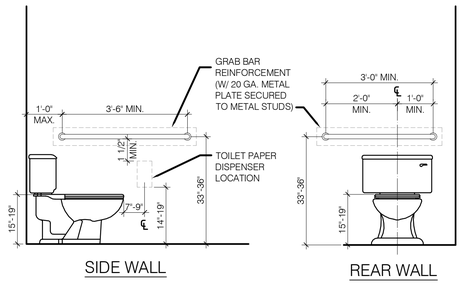


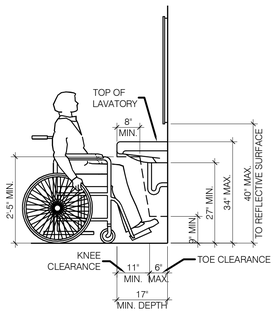
PARALLEL & FORWARD APPROACH



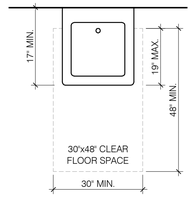
SIDE WALL

REAR WALL

ACCESSIBLE TOILET (INDIVIDUAL USE)

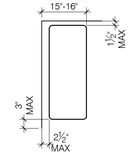


ACCESSIBLE LAVATORY

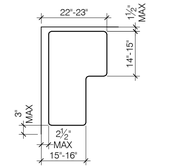


NOTE:GRAB BAR IN ACCESSIBLE TOILET FACILITY
ALL REINFORCEMENT & GRAB BARS ARE REQUIRED FOR ACCESSIBLE TOILET FACILITY

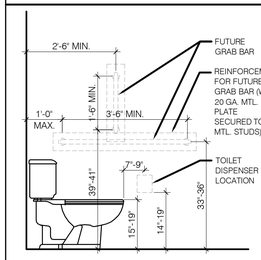
ACCESSIBLE BATHROOM



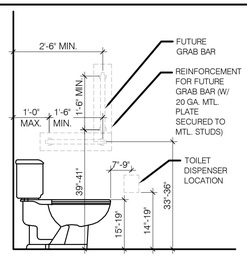
RECTANGULAR SHOWER COMPARTMENT SEAT



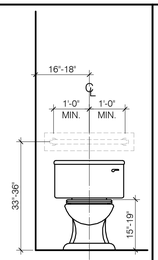
L-SHAPE SHOWER COMPARTMENT SEAT



SIDE WALL - TYPE 'A'

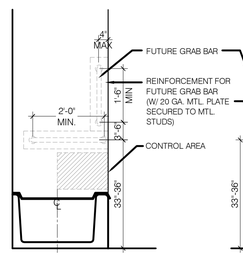


SIDE WALL - TYPE 'B'
(EXCEPTION FOR SIDE WALL THAT CANNOT ACCOMODATE A 42" GRAB BAR)

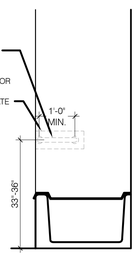


REAR WALL

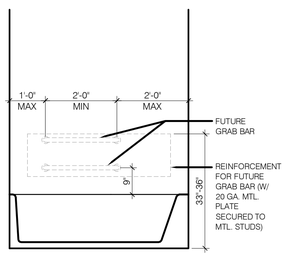
WATER CLOSET



CONTROL END WALL

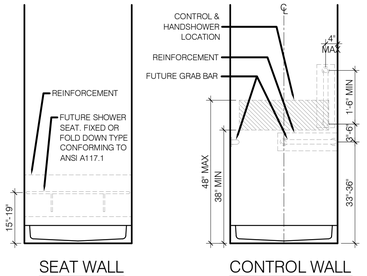


END WALL

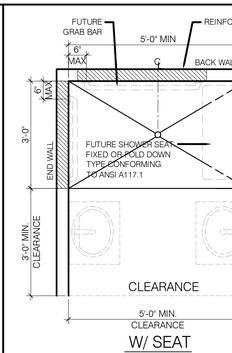


BACK WALL

BATHTUB

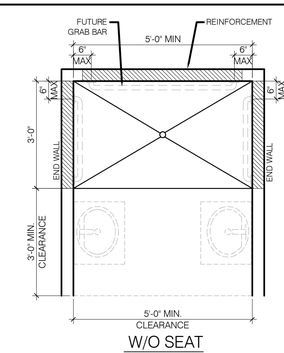


TRANSFER-TYPE SHOWER STALL

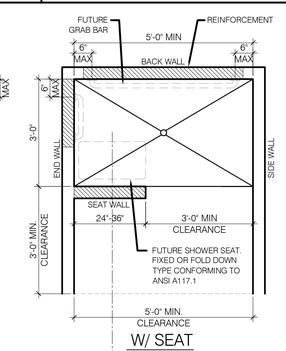


PLAN

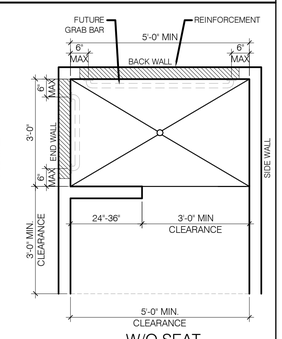
W/ SEAT



W/O SEAT

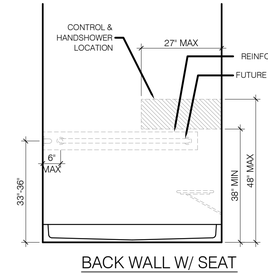


W/ SEAT

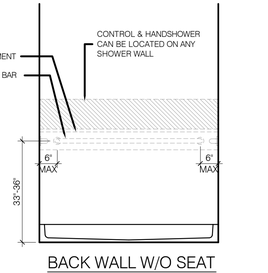


W/O SEAT

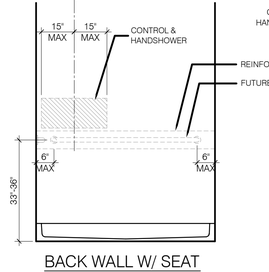
STANDARD ROLL IN TYPE SHOWER COMPARTMENT



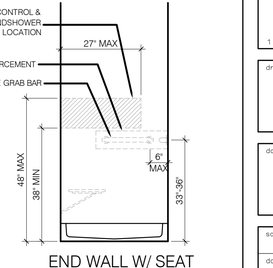
BACK WALL W/ SEAT



BACK WALL W/O SEAT



BACK WALL W/ SEAT



END WALL W/ SEAT

KEY PLAN

BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
1		06/28/13	ISSUED TO DOB

ISSUES/REVISIONS

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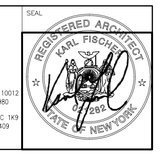
TEL: (212) 219-9733 FAX: (212) 219-8980
1420 NOTRE-DAME WEST, MONTREAL, QC H3C 1K9
TEL: (514) 933-4137 FAX: (514) 933-0409
WEB SITE: WWW.KFARCHITECT.COM
E-MAIL:KARL@KFARCHITECT.COM

SEAL



project title
RESIDENTIAL DEVELOPMENT
1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
ADA NOTES & DIAGRAMS

dob no
000000000

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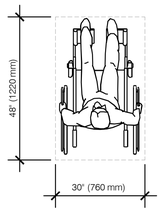
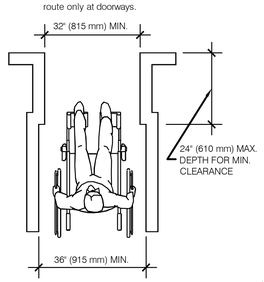
date 03/2013	sheet no. ---- OF
drawn	drawing no. G-005.00
checked KF	

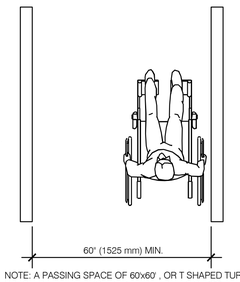


CLEAR FLOOR SPACE
FOR SINGLE WHEELCHAIR

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

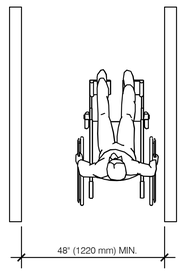


MIN. CLEAR WIDTH
FOR SINGLE WHEELCHAIR

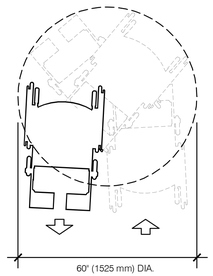


NOTE: A PASSING SPACE OF 60x60" , OR T SHAPED TURING SPACE, SHALL BE PROVIDED AT INTERVALS OF 200'.

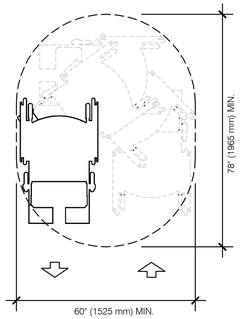
MIN. CLEAR WIDTH
FOR TWO WHEELCHAIRS



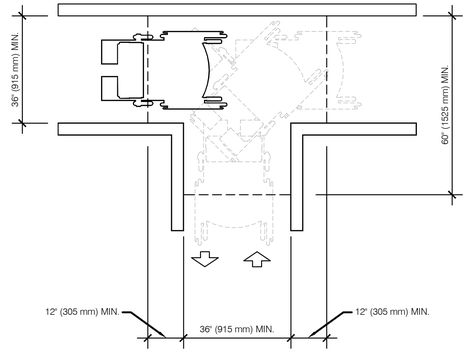
MIN. CLEAR WIDTH
FOR ONE WHEELCHAIR AND
ONE AMBULATORY PERSON



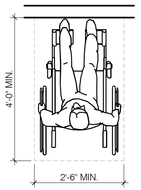
SPACE NEEDED TO
TURN A WHEELCHAIR



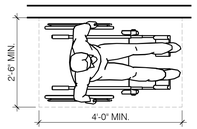
SPACE NEEDED
FOR SMOOTH U-TURN



T-SHAPED SPACE FOR 180° TURN

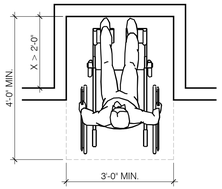


FORWARD

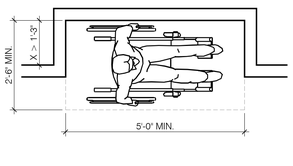


PARALLEL

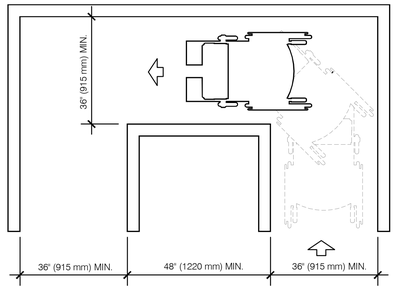
POSITION OF CLEAR FLOOR SPACE



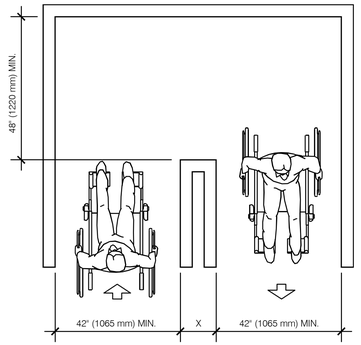
FORWARD APPROACH



PARALLEL APPROACH



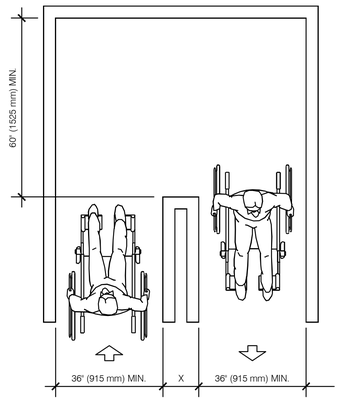
90° WHEELCHAIR TURN



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

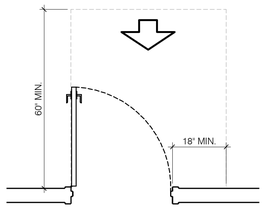
180 DEGREE TURN

CLEAR WIDTH AT TURN

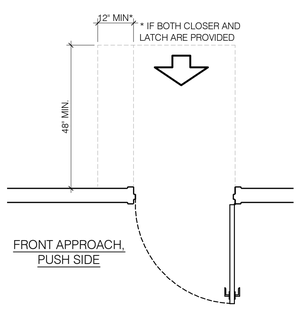


NOTE: Dimensions shown apply when x < 48 in. (1220 mm).

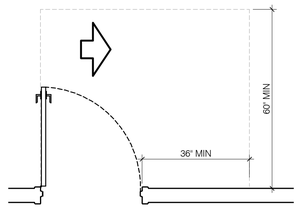
180 DEGREE TURN (Exception)



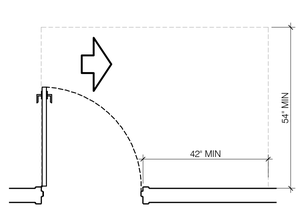
FRONT APPROACH,
PULL SIDE



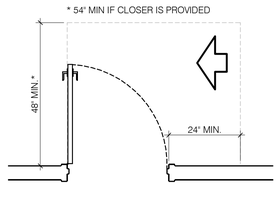
FRONT APPROACH,
PUSH SIDE



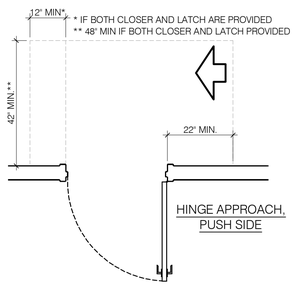
HINGE APPROACH,
PULL SIDE



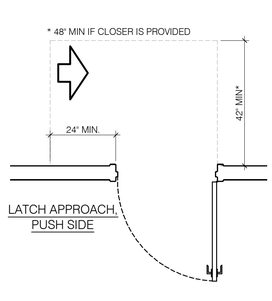
HINGE APPROACH,
PULL SIDE



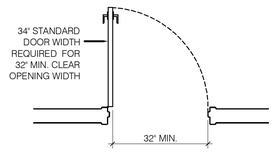
LATCH APPROACH,
PULL SIDE



HINGE APPROACH,
PUSH SIDE

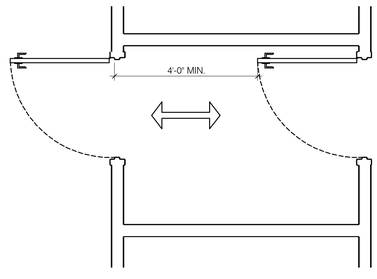


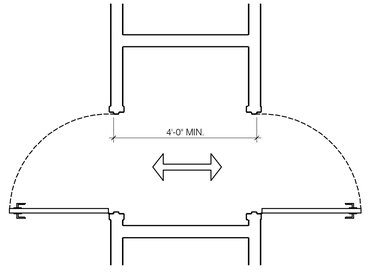
LATCH APPROACH,
PUSH SIDE

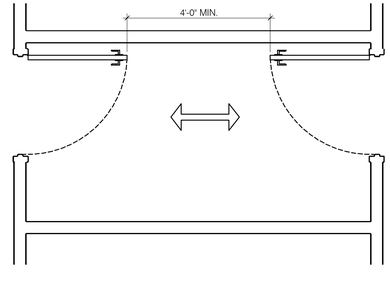


CLEAR OPENING WIDTH
SWINGING DOOR

MANEUVERING CLEARANCES AT MANUAL SWINGING DOORS AND GATES

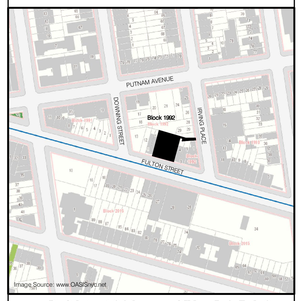






DOORS IN SERIES AND GATES IN SERIES

KEY PLAN



BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
1		06/28/13	ISSUED TO DOB

ISSUES/REVISIONS

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CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
OAQ QAA RAIC AIA
530 BROADWAY, 9th FLOOR, NEW YORK, NY 10012
TEL: (212) 219-9733 FAX: (212) 219-8980
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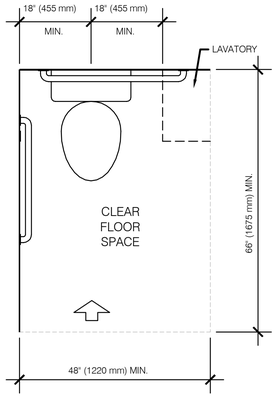
SEAL

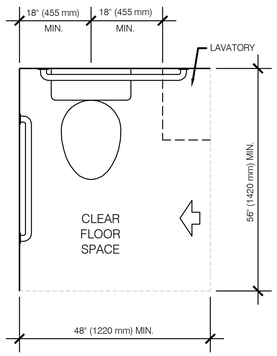
project title
RESIDENTIAL DEVELOPMENT
1045 FULTON STREET, BROOKLYN, NY 11238

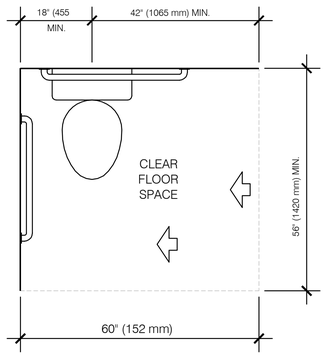
drawing title
ADA NOTES & DIAGRAMS

dob no
000000000

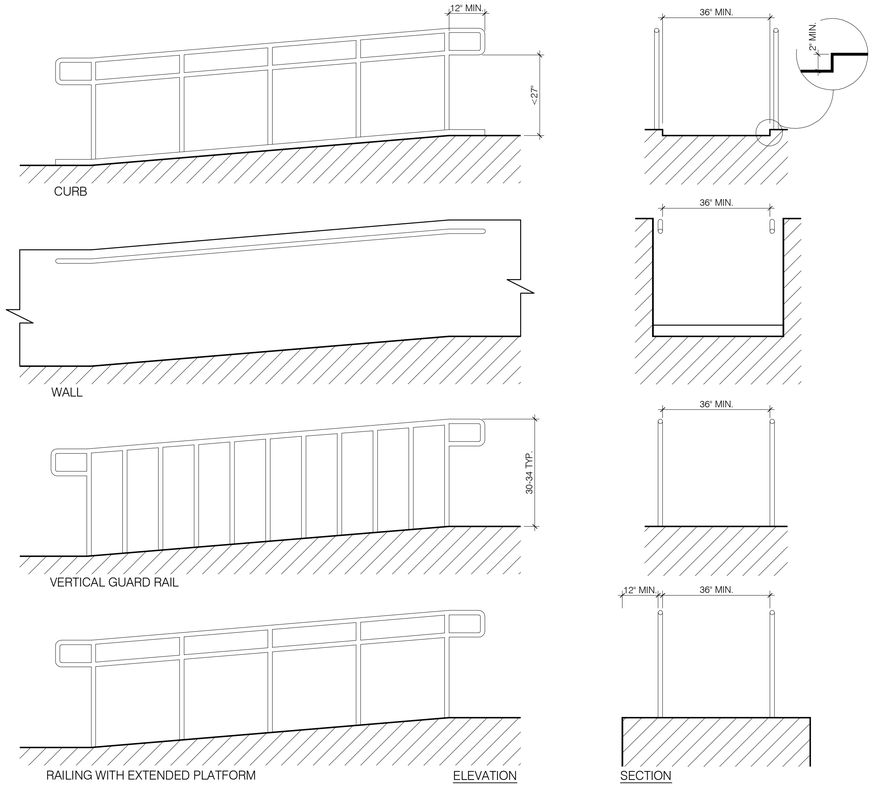
scale 3/16" = 1'-0"	project no. 13-06
date 03/2013	sheet no. ---- OF
drawn	drawing no. G-006.00
checked KF	



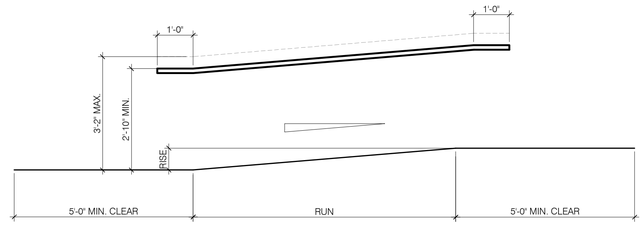




CLEAR FLOOR SPACE AT WATER CLOSETS

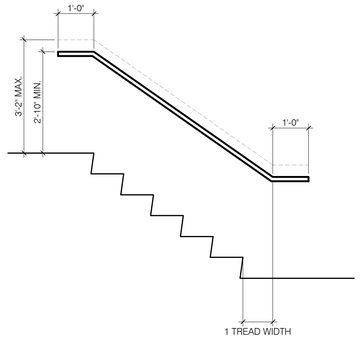


EXAMPLES OF EDGE PROTECTION & HANDRAIL EXTENSIONS

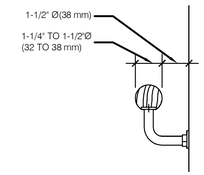


SLOPE	MAXIMUM RISE	MAXIMUM RUN
1:12 TO 1:15	30 INCHES	30 FEET
1:16 TO 1:19	30 INCHES	40 FEET
1:20	30 INCHES	50 FEET

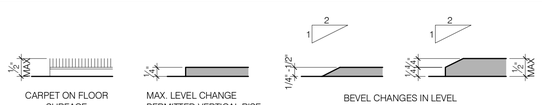
RAMP REQUIREMENTS



HANDRAIL REQUIREMENTS FOR STAIRS



HANDRAIL REQUIREMENTS
(WALL MOUNTED)



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

HEIGHT CHANGES AND FLOOR SADDLES

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KARL FISCHER ARCHITECT
AIA 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

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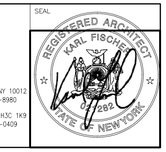


project title

RESIDENTIAL DEVELOPMENT

1045 FULTON STREET, BROOKLYN, NY 11238

drawing title

ADA NOTES & DIAGRAMS

dob no

000000000

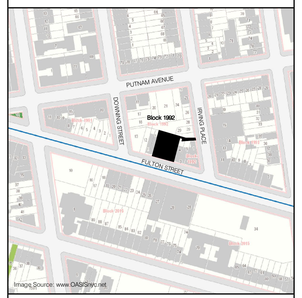
scale: 3/16" = 1'-0"	project no.: 13-06
date: 03/2013	sheet no.: ---- OF
drawn:	drawing no.: G-007.00
checked: KF	

ZONING ANALYSIS

ADDRESS:	1045 FULTON STREET, BROOKLYN, NY 11238
Block:	1992
Lot(s):	5, 6, 7, 8, 9 (Interior lots)
Tentative lot:	
Zoning District(s):	R7A / C2-4 OVERLAY with inclusionary housing within 100 ft. of Fulton Street
Zoning Map:	16c
Lot Area:	6,109.8 s.f.
Lot Area in (R7A/C2-4) IH:	6,109.8 s.f.
Community Board:	302

Applicable ZR Section	Item	Required/Permitted - R7A / C2-4	Proposed	Compliance
11-15	Environmental Requirements	City Environmental Quality Review (CEQR) Prior to issuing a building permit DOB to receive report from DEP stating that the environmental requirements related to the (E-183) designation have been met for that lot.	Approved letter "NOTICE TO PROCEED" from DEP is provided	Complies See submitted letter
12-10	Floor Area (c)(5)	##########	Provided open terraces are less than 50% enclosed with parapets not higher than 3'-8".	Complies
12-10	Floor Area (c)(10)	##########	Provided exterior balconies are less than 67% enclosed with railings more than 50% open and at a height of 3'-6".	Complies
Articles II & III, Chapter 2 - Use Regulations				
32-00	General Provisions, Uses Permitted	UG 1 & 2 (Residential); 3 & 4 (Community Facility); 5 to 9 & 14 (Retail & Commercial)	UG 2, Residential; UG 6, Retail	Complies
32-11	Use Groups 1 and 2	Use Groups 1 and 2, as set forth in Section 22-12.	See ZR (22-12) below	
22-00	General Provisions, Uses Permitted	UG 1 & 2 (Residential); 3 & 4 (Community Facility)	UG 2, Residential	Complies
22-12	Use Group 2	All residential uses and accessory uses	Proposed multiple dwelling units and accessory uses	Complies
Article II: Residence District Regulations, Chapter 3 - Residential Bulk Regulations in Residence Districts				
23-011	Quality Housing Program	In R7A development shall comply with the quality housing program requirements	Quality housing program requirements are provided See requirements below	Complies
23-03	Street Tree Planting in Residential Districts	Street tree planting to comply with ZR (26-41)	See ZR (26-41) below	
23-10	Open Space and Floor Area Regulations			
23-12(a)	Permitted obstructions in Open Space	The following shall not be considered obstructions when located in any open space: (a) Balconies, unenclosed, subject to the provisions of ZR (23-13)	See ZR (23-13) below	
23-13	Balconies			
23-132	Balconies in R7A	Balconies may project into or over any required open area within a publicly accessible open area, a rear yard, an initial setback distance, any open areas not occupied by towers, any required side or rear setbacks, or any required open space, provided that such balcony: (a) shall not project by a distance greater than 7 ft. as measured from the plane surface of the building wall from which it projects; (b) shall not project into the minimum required distance between buildings on the same zoning lot; (c) shall not cover more than ten percent of the area designated as outdoor recreation space pursuant to ZR 28-30, (d) shall be unenclosed except for a parapet not exceeding 3'-6" in height or a railing not less than 50% open and not exceeding 4'-6" in height; However, such balconies may be recessed into a building wall up to a maximum depth of 6 ft. provided that at least 33% of the perimeter of such balcony is unenclosed except for a parapet or railing; (e) shall be located at or higher than the floor level of the third story of a building or at least 20 ft. above curb level; (f) shall have an aggregate length, at the level of any story, not exceeding 50% of the length at that level.	(a) Balconies are provided with projection of 5'-0" at rear of building at 3rd - 8th floors. (b) One building is provided on the zoning lot. (c) No balconies are proposed over outdoor recreation space. (d) Balconies provided at 3rd - 8th floor are unenclosed with 100% unenclosed perimeter, railing height of 3'-6" and more than 50% open railing. (e) Balconies are provided at 3rd - 8th floor level. (f) Length of provided balconies is less than 50% of the length of such level where they are located, see elevation diagram (Z-004)	Complies
23-144	In Designated Areas Where The Inclusionary Housing program is Applicable	In Community District 2, Brooklyn R7A, see Appendix "F" The permitted FAR shall be as set forth in ZR (23-952)	See ZR (23-952) below for FA calculation under inclusionary housing designated area	Complies
23-145	For Quality Housing buildings	In district R7 for an interior zoning lot where Quality Housing buildings are developed, the maximum residential lot coverage shall be 65% and the maximum floor area ratio shall be 4.00.	Max. allowable lot coverage = 6,109.8 s.f. x 65% = 3971.37 s.f. Proposed lot coverage = 3961.9 s.f. < 3971.37 s.f. Proposed lot area coverage percentage = 3961.9 s.f./6109.8 s.f. = 65%	Complies
23-22	Maximum Number of Dwelling Units or Rooming Units	Max. permitted no. of DU = 28,105.0/680 = 41.3 = 41 DU	Proposed no. of DU = 36 DU	Complies
23-30	Lot Area and Lot Width Regulations			
23-32	Minimum Lot Area or Lot Width for Residences	In R7A, min lot area = 1,700 s.f., min lot width = 18 ft.	Lot Area = 6,109.8 s.f., Lot width = 72'-8" See plot plan diagram (Z-003) & Site Plan (A-010)	Complies
23-40	Yard Regulations			
23-42	Level of Yards	The level of a yard or rear yard equivalent shall not be higher than curb level, except that natural grade level need not be disturbed in order to comply with this requirement.	Rear yard is provided at existing natural grade level See Site Plan (A-010) & Architectural Survey (V-001)	Complies
23-45	Minimum Required Front Yard	No front yard is required	No front yard is provided	Complies
23-462(c)	Minimum Required Side Yards	No side yard is required or min. of 8 ft. if provided	No side yard is provided	Complies
23-47	Minimum Required Rear Yards	Min. of 30'-0" rear yard is required	Rear yard provided is 30'-0", see Site Plan (A-010)	Complies
23-541	Within one hundred feet of corners	In district R7, no rear yard shall be required within 100 feet of the point of intersection of two street lines intersecting at an angle of 135 degrees or less.		
23-542	Along short dimension of block	In district R7, whenever a front lot line of a zon ing lot coincides with all or part of a street line measuring leess than 230 feet in length between two intersecting streets, no rear yard shall be required within 100 feet of such front lot line.		
23-60	Height And Set Back 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: (a) Balconies, unenclosed subject to the provisions of ZR (23-13) (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. (h) Parapet walls, not more than 4 ft. high.	Proposed balconies do not penetrate building height or sky exposure planes. Proposed stair and elevator bulkhead are complying, See Sheet (Z-004) Proposed parapet walls are 4 ft. max. above roof See proposed bulkhead diagram sheet (Z-004)	Complies
23-621	Permitted Obstructions in Certain Districts	The permitted obstructions set forth in ZR 23-62 shall apply to any building or other structure In addition, a dormer may be allowed as a permitted obstruction within a required setback area. Such dormer may exceed a maximum base height provided that on any street frontage, the aggregate width of all dormers at the maximum base height does not exceed 60 percent of the length of the street wall of the highest story entirely below the maximum base height For each foot of height above the maximum base height, the aggregate width of all dormers shall be decreased by one percent of the street wall width of the highest story entirely below the maximum base height.	Dormer is provided on the 7th & 8th floor See dormer diagram sheet (Z-004)	Complies
23-632(b)	Front Setbacks in Districts Where Front Yards Are Not Required	Comply with ZR (23-633)	See ZR (23-633) below	
23-633	Street Wall Location And Height And Setback Regulations in Certain Districts			
23-633(a)(1)	Street Wall Location	In R7A, the height of the building shall be measured from the base plane. The street wall on any development shall be located no closer to the street line than the closest street wall of an existing building to such street line located on the same block, and within 150 ft. of such development. however the street wall need not to be located further from the street line more than 15 ft.	The building street wall is located on the street line as per existing adjacent buildings within 150 ft., see Site Plan (A-010)	Complies
23-633(b)	Setback Regulations	Setbacks are required for all portions of building shall be provided between the min. base height and the max. base height as follow: (1) Setback with depth of at least 10 ft. shall be provided between the min. base height (40 ft.) and the max. base height (65 ft.) on wide street.	The proposed building sets back as required. See Elevations (A-200 & A-201) and Site Plan (A-010)	Complies
23-633(c)	Maximum Building Height	No building or other structure shall exceed the max. building height of 80 ft.	Proposed building height is 80 ft. See building section diagrams sheet (Z-004)	Complies
23-663 (b)	Required Rear Setbacks	No portion of a building that exceeds the applicable max. base height (65ft.) shall be nearer to a rear yard line than 10 ft.	No rear setback is provided at rear of proposed building as no rear yard is required (ZR-23-541/23-542) See Site Plan (A-010)	Complies
23-89	Open Area Requirements for Residences			
23-892 (a)	In R6 through R10 Districts	In R7A, the entire area of the zoning lot between the street line and all street walls of the building and their prolongations shall be planted at ground level, or in raised planting beds that are permanently affixed to the ground, except that such plantings shall not be required at the entrances to and exits from the building, within driveways accessing off-street parking spaces located within, to the side, or rear of such building, or between commercial uses and the street line.	There are no areas between the street line and the building street walls. See 1st Floor Plan (A-101) & Site Plan (A-010)	Complies
23-952	Floor Area Compensation in Inclusionary Housing designated Areas	The residential floor area of a zoning lot in inclusionary housing designated areas as set forth in Appendix "F" may not exceed the base FAR of 3.45, except that such floor area may be increased on a compensated zoning lot by 1.25 s.f. for each square foot of low income floor area provided, up to a maximum FAR of 4.60. However, the amount of low income floor area required to receive such floor area compensation need not exceed 20% of the total floor area, exclusive of ground floor non-residential floor area on the compensated zoning lot.	Inclusionary housing is provided and maximum FAR of 4.60 is used to calculate the allowable FA in inclusionary housing designated area (6,109.8 s.f., 100% of total lot area), see area chart (Z-002) See lot coverage diagram sheet (Z-003)	Complies
Article II: Residence District Regulations, Chapter 5 - Accessory Off-Street Parking and Loading Regulations				
25-23	Requirements Where Group Parking Facilities are Provided	The required no. of accessory off-street parking spaces is 50% of the no. of dwelling units. 32 x 0.5 = 16 parking spaces are required	See ZR (25-241) below	
25-24	Modification of Requirements for Small Zoning Lots	In R7A, for small zoning lots, the requirements of ZR (25-23) shall be modified as per ZR (25-241)	See ZR (25-241) below	
25-241	Reduced Requirements	In R7A, for zoning lots of 10,000 or 15,000 s.f. or less, the number of required accessory off-street parking spaces is 30 percent of the total dwelling units.	Zoning lot area: 6,109.8 s.f. Total number of proposed dwelling units: 36 Number of parking spaces required: 36 dwelling units x .30 = 10.8 = 10 parking spaces required See ZR (25-261) below	
25-261	For developments or Enlargements	In R7A, for new developments, the maximum number of accessory off-street parking spaces for which requirements are waived is 15.	Required no. of spaces = 11, see ZR (25-241) above No parking spaces are provided	Complies
25-811	Enclosed Bicycle Parking Spaces	1 bicycle parking for each 2 dwelling units is required Required no. of spaces = 36/2 = 18 bicycle spaces	Min. of 18 bicycle parking spaces are provided for 32 dwelling units.	Complies
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 adjon a rack or similar system for securing the bicycle. 15 s.f. of area shall be provided for each bicycle space. Required area = 16 x 15 = 240 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. Bicycle parking spaces area provided = 270 s.f. No. of bicycle spaces required: 18 Min. Min. area required (15 s.f./space): 270 s.f. Provided: 18 bicycle racks, 15 s.f./space See Cellar Floor Plan (A-100)	Complies
25-85	Floor Area Exemption	Spaces provided for bicycle parking shall be excluded from the definition of floor area provided that: (a) Each space does not exceed 15 s.f. (b) The bicycle parking space provided meet the requirements of ZR (25-83).	Bicycle parking spaces are located at Cellar Floor and area is not deducted from zoning floor area. See area chart (Z-002)	Complies
Article II: Residence District Regulations, Chapter 6 - Special Urban Design Guidelines				
26-40	Street Tree Planting and Planting Strip requirements			
26-41	Street Tree Planting	One street tree, pre-existing or newly planted, shall be provided for every 25' of street frontage of the zoning lot. Fractions equal to or greater than one-half resulting from this calculation shall be considered to be one tree. Such trees shall be planted at approximately equal intervals along the entire length of the curb of the street adjacent to the zoning lot. The species and caliper of all street trees shall be determined by Department of Parks & Recreation, and all such trees shall be planted in accordance with the street tree planting standards of the Department of Parks & Recreation.	Fulton Street frontage = 72'-8"; See Architectural Survey (Z-010). Total number of trees required = 72'-8" / 25' = 2.9 = 3 trees Number of existing on-site trees = 0 trees Number of on-site trees proposed = 0 trees Number of off-site trees proposed = 3 trees Total number of trees proposed = 3 trees The alternative location shall be determined by the Department of Parks & Recreation.	Complies See Parks Department approval
26-42	Planting Strips	Developer shall provide & maintain planting strips. Required street trees shall be planted within such strips. Strip shall be fully planted with grass or groundcover. Driveways are permitted to traverse such planting strip, and utilities are permitted to be located within such planting strip.	Planting strips are not provided. See 23-892 (a) above. See approved BPP and Site Plan (A-010)	Complies
Article II: Residence District Regulations, Chapter 8 - The Quality Housing Program				
28-00	General Purposes	Multiple family housing	Multiple family housing	Complies
28-01	Applicability	In district R7A, buildings containing residences shall comply with the Quality Housing Program standards and requirements.	Quality housing requirements are provided	Complies
28-11	Bulk Regulations	Bulk regulations in Article II, Chapter 3, Article III, Chapter 5 shall apply.	See zoning analysis in applicable chapters above	Complies
28-21	Size of dwelling units	Any dwelling shall have an area of at least 400 s.f. min.	All units are more than 400 s.f., See area chart sheet (Z-002)	Complies
28-22	Windows	All windows in the residential portion to be double-glazed	All proposed windows to be double-glazed, see Window Schedule (A-702).	Complies
28-23	Refuse storage and disposal	Refuse storage with Min of 2.9 cu.ft. per dwelling unit shall be provided. Required refuse storage room = 2.9 x 36 = 104.4 cu.ft. A refuse disposal room with min. 12 s.f. with no dimension less than 3'-0" shall be provided on each story that has entrances to dwelling units.	Refuse storages area provided (compactor room) = 304 s.f. x 9'-2" high = 2,787 cu. ft. > 104.4 cu.ft. A refuse disposal room is provided on each floor from 1st-8th floors with min. dimension of 4'-0" See floor plans (A-101 thru A-108)	Complies
28-24	Laundry Facilities	If the building provides the following, then that portion of the laundry room shall be excluded from the definition of FA: (a) at least 1 washing machine per 20 d.u. & 1 dryer per 40 D.U. Required 2 washers and 1 dryer; (b) the machines are located in a room additional with 3 s.f. equipped with chairs and tables for folding laundry for each machine provided; (c) Such room have an exterior wall with windows measure not less than 9.5% of total floor space of the room.	Laundry Room is provided at Cellar Floor and area is not deducted from zoning floor area. See Cellar Plan (A-100) See area chart sheet (Z-002)	Complies
28-31	Required Recreation Space	Required recreation space of 3.3% of Residential floor area 27,258 x 3.3% = 899.5 s.f.	No indoor recreation space is proposed. Outdoor recreation space of 916 s.f. provided in rear yard. 916 s.f. > 899.5 s.f. See 1st Plan (A-109).	Complies
28-32	Standards for Recreation Space	Min. size of any outdoor recreation space = 225 s.f. and min. size of any indoor recreation space = 300 s.f. Min. dimension of any recreation space shall be 15 ft. Indoor recreation space can be deducted from F.A. when it has window(s) measuring not less than 9.5% of total floor space of the room.		
28-33	Planting Areas	The area of the zoning lot between the street line and the street wall of the building shall be planted at ground level, or in raised planting beds that are permanently affixed to the ground, pursuant to the provisions of Section 23-892.	See ZR (23-892) above	
28-41	Density per Corridor	50% of the corridor F.A. can be deducted when the no. of dwelling units served by a vertical core and corridor does not exceed 11 dwelling units.	No. of DU on each floor from 2nd - 8th floors varies from 5 units to 4 units on each floor. 50% of the FA of the corridor is deducted from FA. See area chart (Z-002) & deduction plans (Z-101& Z-102)	Complies
28-50	Parking	Accessory off-street parking in Article II, Chapter 5 shall apply	Parking space requirements are waived, See ZR (25-261) above	
Article III: Commercial District Regulations, Chapter 4 - Bulk Regulations for Residential Buildings in Commercial Districts				
34-11	General Provisions	In district C2, the bulk regulations of Article II, Chapter 3, shall apply to all residential buildings in accordance with the provisions of this Section, except as modified by the provisions of Sections 34-21 to 34-24, inclusive, relating to Exceptions to Applicability of Residence District Controls.		Complies
34-23	Modifications of Yard Regulations			
34-231	Modifications of front yard requirements	In district C2, no front yard shall be required for any residential building.	No front yard is provided	Complies
34-232	Modifications of side yard requirements	In district C2, no side yard shall be required for any residential building. However, if any open area extending along a side lot line is provided, such open area shall have a width of not less than eight feet.	No side yard is provided	Complies

KEY PLAN



BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description

ISSUES/REVISIONS

MEP ENGINEER:
TSF ENGINEERING PC
200 Park Avenue South, Suite 1020, New York, NY 10003
Tel: (212) 253-7300 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
OAQ OAA 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
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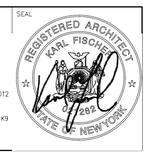

project title
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1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
ZONING ANALYSIS

dob no
000000000

scale: N.T.S.	project no.: 13-06
date: 03/2013	sheet no.: ---- OF
drawn:	drawing no.: Z-001.00
checked: KF	

1045 FULTON STREET, Brooklyn, NY 11238
Mixed-Use Development (Inclusionary Housing)

Zoning District R7A w/C2-4 Overlay

24-May-2013

BUILDING AREA CHART (A)

Floor	Gross Floor Area S.F. Commercial	Gross Floor Area S.F. Residential	**Total Gross Floor Area (S.F.)**	Mech. Deduction	Bicycle Parking	Bulkhead	Q.H. Floor Area Deduction: Refuse Room	Q.H. Floor Area Deduction: Corridor Daylight 50%	Q.H. Floor Area Deduction: Corridor Density 50%	**Total Floor Area Deduction (S.F.)**	Zoning Floor Area S.F. Commercial	Zoning Floor Area S.F. Residential	**Total Zoning Floor Area (S.F.)**	F.A.R.
CELLAR		3,008.8	3,008.8		270.0									
1ST		3,860.9	3,860.9	92.4	0.0	0.0	12.0	215.2	215.2	534.7	0.0	3,326.2	3,326.2	0.54
2ND		3,962.9	3,962.9	94.7	0.0	0.0	12.0	162.4	162.4	431.5	0.0	3,531.4	3,531.4	0.58
3RD		3,962.9	3,962.9	94.7	0.0	0.0	12.0	162.4	162.4	431.5	0.0	3,531.4	3,531.4	0.58
4TH		3,962.9	3,962.9	94.7	0.0	0.0	12.0	162.4	162.4	431.5	0.0	3,531.4	3,531.4	0.58
5TH		3,962.9	3,962.9	94.7	0.0	0.0	12.0	162.4	162.4	431.5	0.0	3,531.4	3,531.4	0.58
6TH		3,962.9	3,962.9	89.3	0.0	0.0	12.0	162.4	162.4	426.1	0.0	3,536.8	3,536.8	0.58
7TH		3,498.8	3,498.8	68.2	0.0	0.0	12.0	142.0	142.0	364.2	0.0	3,134.6	3,134.6	0.51
8TH		3,498.8	3,498.8	68.2	0.0	0.0	12.0	142.0	142.0	364.2	0.0	3,134.6	3,134.6	0.51
ROOF		362.0	362.0			362.0				362.0	0.0	0.0	0.0	0.00
TOTAL (above grade)	0.0	31,035.0	31,035.0	696.9	0.0	362.0	96.0		1,311.2	3,777.2	0.0	27,257.8	27,257.8	4.46
TOTAL	0.0	34,043.8	34,043.8	696.9	270.0	362.0	96.0		1,311.2	3,777.2	0.0	27,257.8	27,257.8	4.46

UNIT CHART

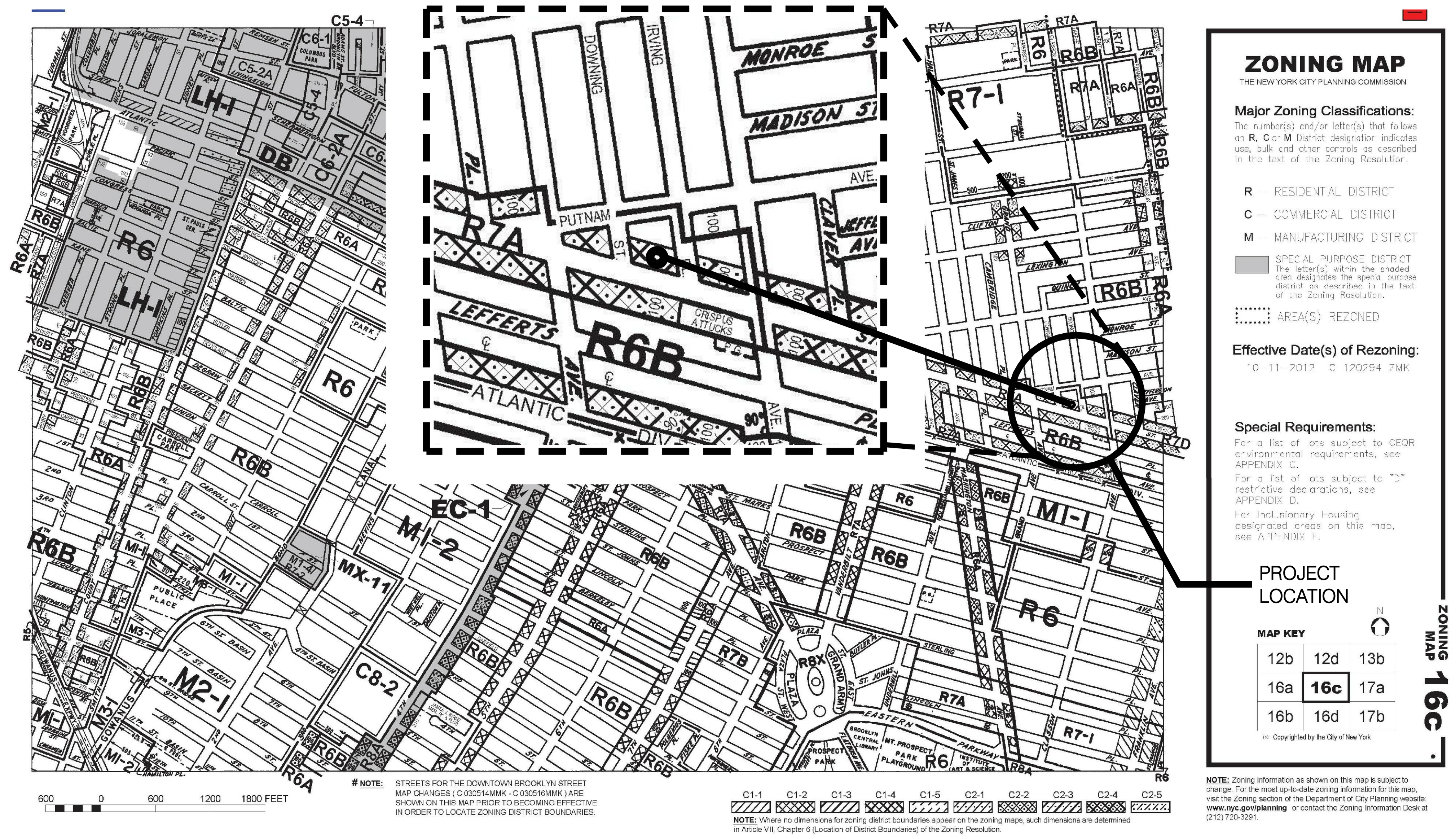
Floor	Dwelling Units Sellable Area (S.F.): A GROSS	B GROSS	C GROSS	D GROSS	E GROSS	No. of Units Per Floor	Residential Sellable Gross Floor Area
CELLAR							
1ST	630		632	687	690	4	
2ND	630	612	632	687	690	5	3,251
3RD	630	612	632	687	690	5	3,251
4TH	630	612	632	687	690	5	3,251
5TH	630	612	632	687	690	5	3,251
6TH	895		895	687	690	4	3,167
7TH	878		748	541	690	4	2,857
8TH	878		748	541	690	4	2,857
ROOF							
TOTAL						36	21,885

BUILDING AREA CHART (B)

LOT AREA	**6,109.8**	S.F.
MAX. PERMITTED F.A.R. WITH INCLUSIONARY HOUSING	**4.60**	
MAX. ALLOWABLE ZONING FLOOR AREA = 6,109.8 X 4.60	**28,105.0**	S.F.
Proposed Commercial Gross Floor Area (above grade)	0.0	S.F.
Proposed Residential Gross Floor Area (above grade)	31,035.0	S.F.
PROPOSED TOTAL GROSS FLOOR AREA (above grade)	**31,035.0**	**S.F.**
PROPOSED TOTAL FLOOR AREA DEDUCTION	**3,777.2**	S.F.
Proposed Commercial Zoning Floor Area (above grade)	0.0	S.F.
Proposed Residential Zoning Floor Area (above grade)	27,257.8	S.F.
PROPOSED TOTAL ZONING FLOOR AREA (above grade)	**27,257.8**	**S.F.**
PROPOSED F.A.R.	**4.46**	
UNDERDEVELOPED ZONING FLOOR AREA	**847.2**	S.F.

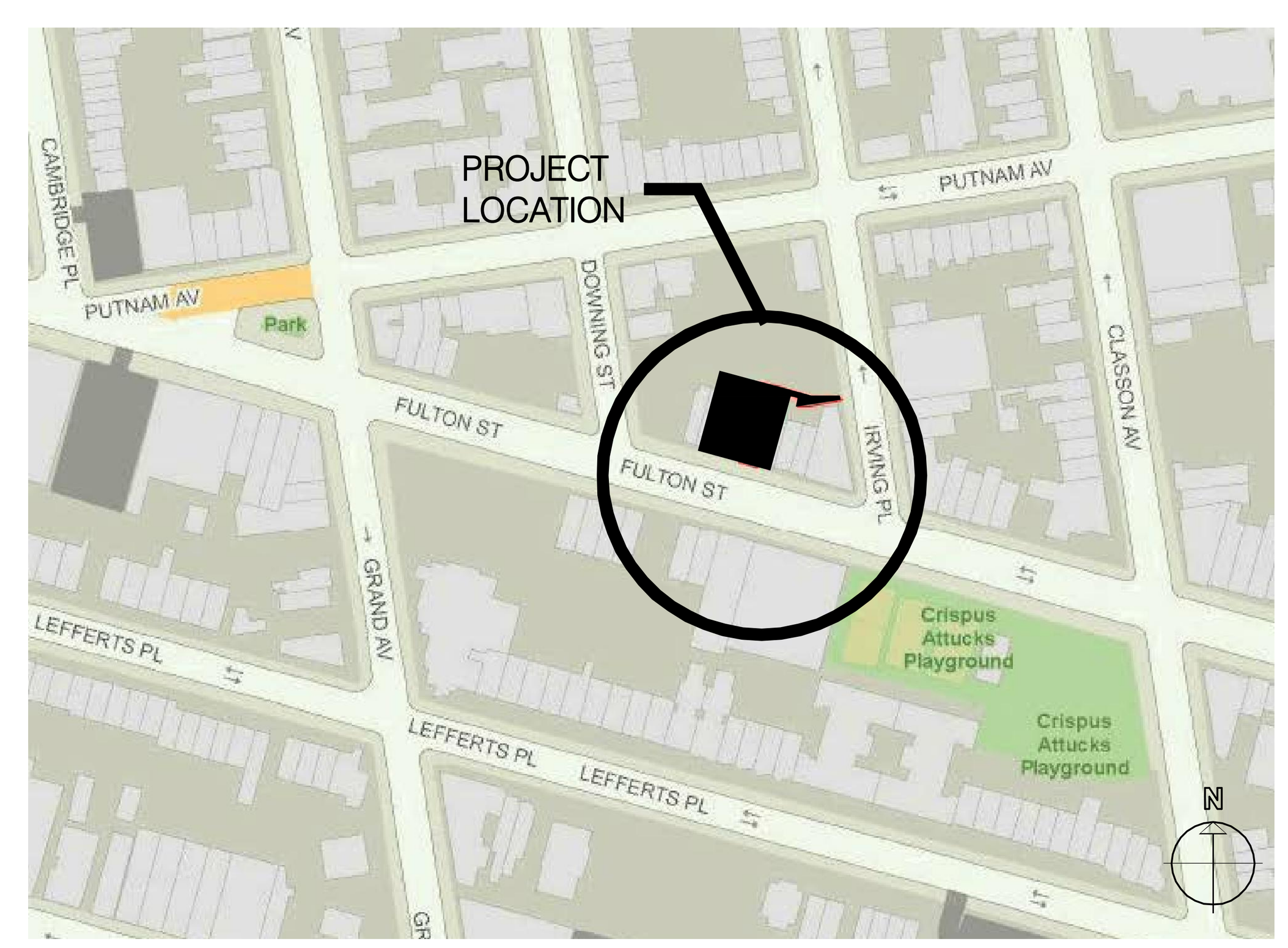
UNIT MIXTURE COUNT

UNIT TYPE	COUNT	%
STUDIO	0	0%
1 BEDROOM	30	83%
2 BEDROOM	6	17%
3 BEDROOM	0	0%
1 BEDROOM + H.O.	0	0%
TOTAL NUMBER OF UNITS	36	100%
MAX. ALLOWABLE NUMBER OF UNITS: 41		



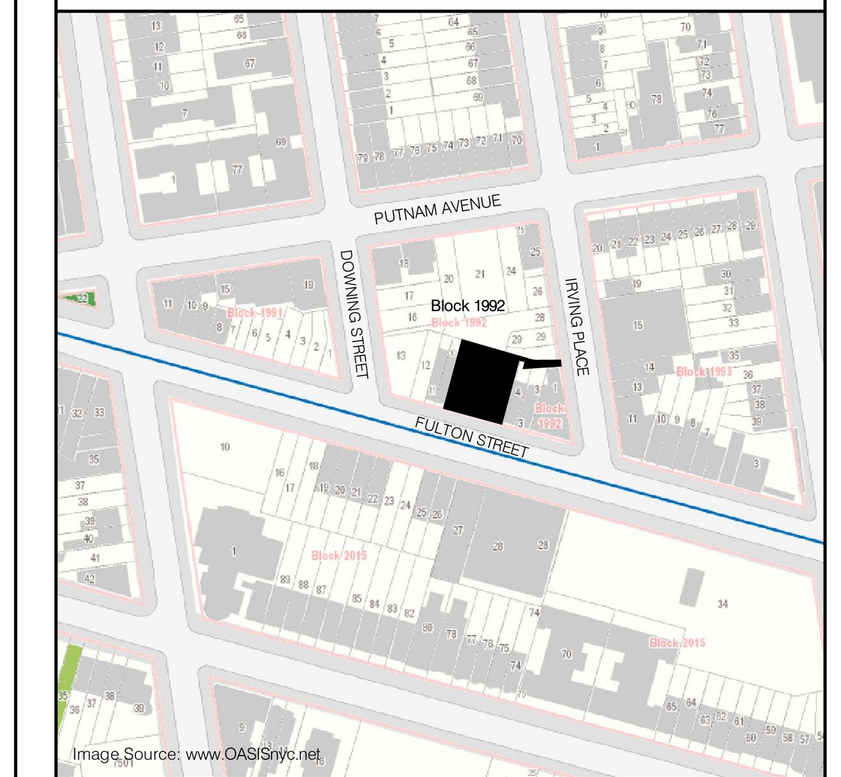
1 ZONING MAP - MAP NO. 16c
Z-002.00 N.T.S.

2 APPENDIX 'F': Inclusionary Housing Designated Areas
Z-002.00 N.T.S. Map 3 - (9/30/09)



3 SITE AERIAL VIEW
Z-002.00 N.T.S.

KEY PLAN



BLOCK: 1992 LOTS: 5,6,7,8,9

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MEP ENGINEER:
TSF ENGINEERING PC
200 Park Avenue South, Suite 1020, New York, NY 10003
Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
OAQ OAA 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 021282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
ZONING ANALYSIS

dob no
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scale: N.T.S.	project no.: 13-06
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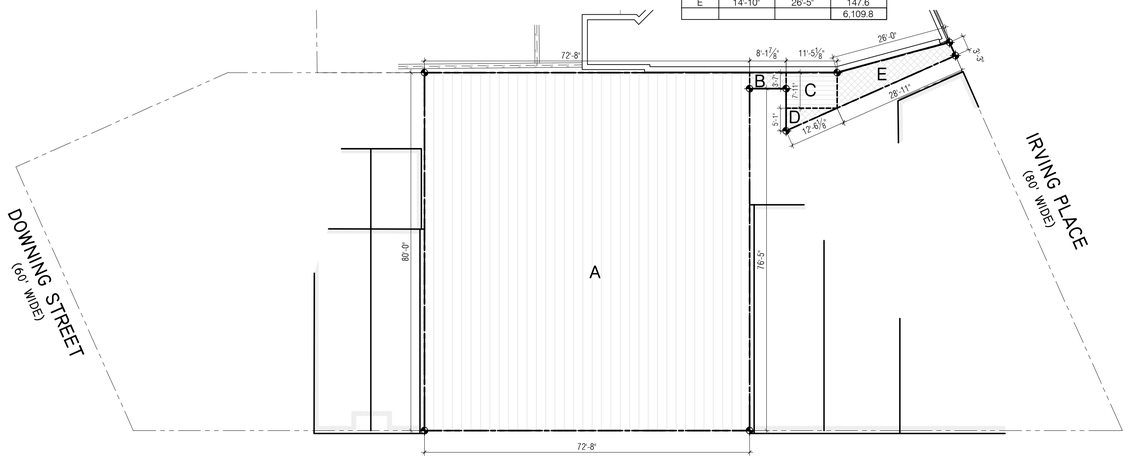
LOT AREA			
LOT SEGMENTS (R7A)			AREA (S.F.)
TAG	WIDTH	LENGTH	
A	80'-0"	72'-8"	5,813.3
B	8'-2"	3'-7"	29.2
C	7'-11"	11'-5"	90.5
D	5'-1"	11'-5"	29.0
E	14'-10"	26'-5"	147.6
			6,109.8



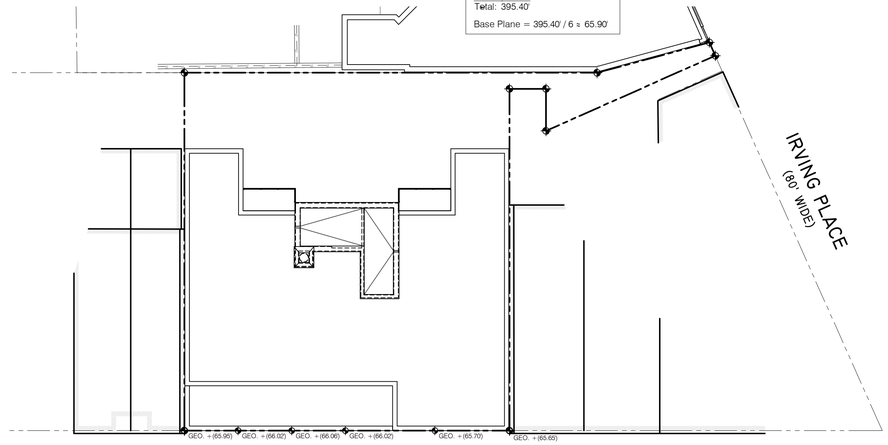
FULTON STREET
(80' WIDE)

2 LOT AREA CALCULATION DIAGRAM
Z-003.00 — 1/16" = 1'-0"

Building Base Plane Calculation:

Elev. 65.95'
Elev. 66.02'
Elev. 66.06'
Elev. 66.02'
Elev. 65.70'
Elev. 65.65'
Total: 395.40'

Base Plane = 395.40' / 6 = 65.90'



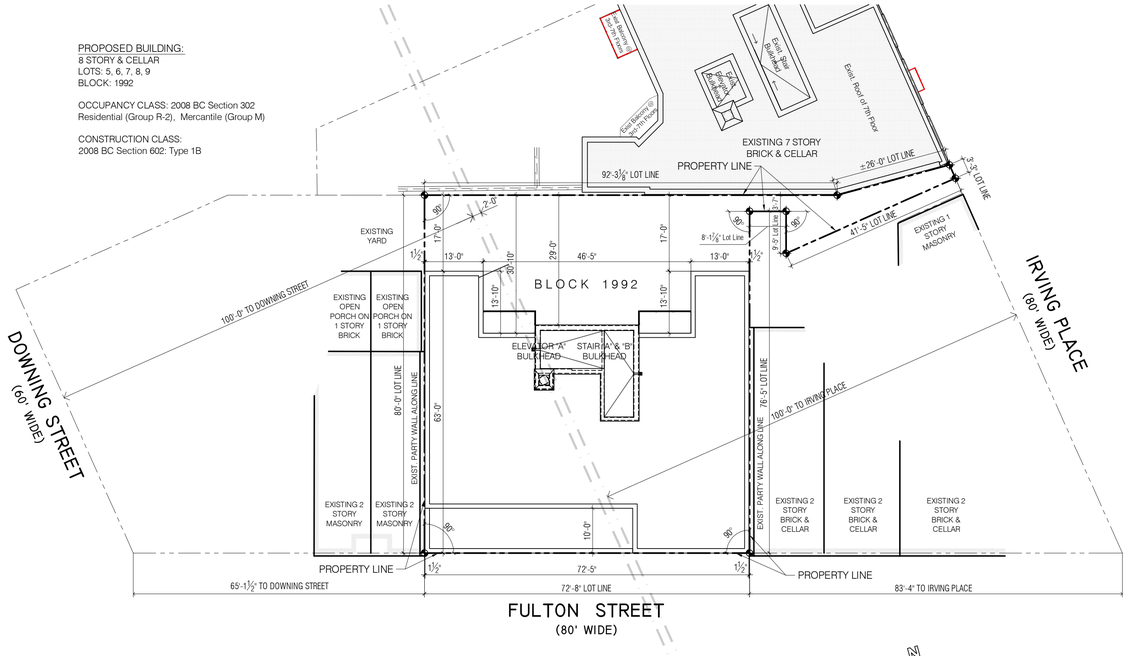
FULTON STREET
(80' WIDE)

4 BASE PLANE CALCULATION DIAGRAM
Z-003.00 — 1/16" = 1'-0"

PROPOSED BUILDING:
8 STORY & CELLAR
LOTS: 5, 6, 7, 8, 9
BLOCK: 1992

OCCUPANCY CLASS: 2008 BC Section 302
Residential (Group R-2), Mercantile (Group M)

CONSTRUCTION CLASS:
2008 BC Section 602: Type 1B



FULTON STREET
(80' WIDE)

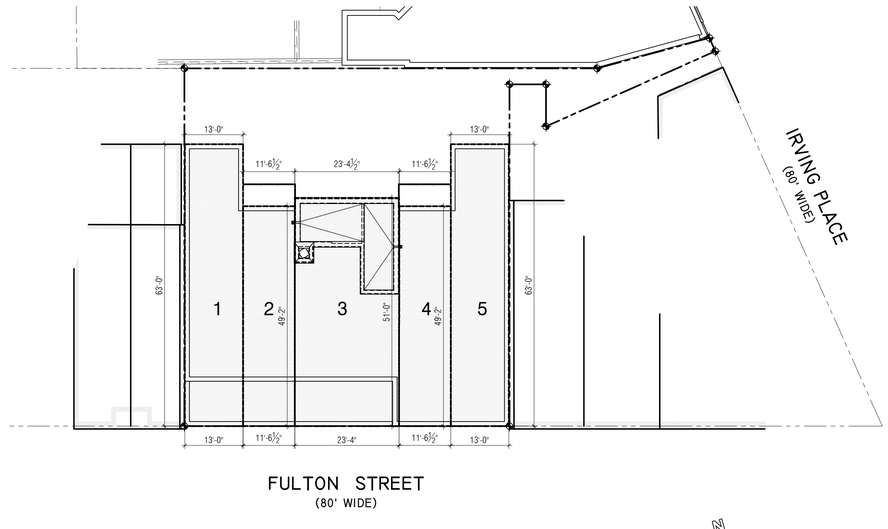
1 PLOT PLAN DIAGRAM
Z-003.00 — 1/16" = 1'-0"

INTERIOR LOT AREA COVERAGE			
BUILDING			AREA (SF)
TAG	LENGTH	WIDTH	
01	13'-0"	63'-0"	819.0
02	11'-6"	49'-2"	567.4
03	23'-4"	51'-0"	1,190.0
04	11'-6"	49'-2"	566.4
05	13'-0"	63'-0"	819.0
			3,961.9

INTERIOR LOT AREA COVERAGE:

Max. Permitted Lot Area Coverage as per ZR 23-145
= 6109.8 SQ. FT. x 0.65 = 3971.37 SQ. FT.
Proposed Total Lot Area Coverage
= 3961.9 SQ. FT. < 3971.37 SQ. FT.

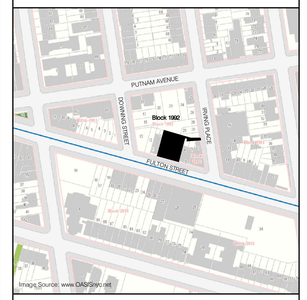
Proposed Lot Area Coverage Percentage
= 3961.9 SQ. FT. / 6109.8 SQ. FT. = 65%



FULTON STREET
(80' WIDE)

3 LOT COVERAGE DIAGRAM
Z-003.00 — 1/16" = 1'-0"

KEY PLAN



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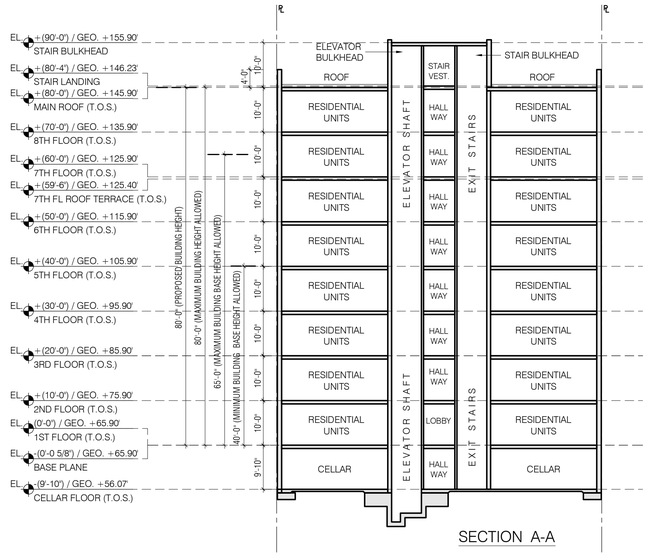
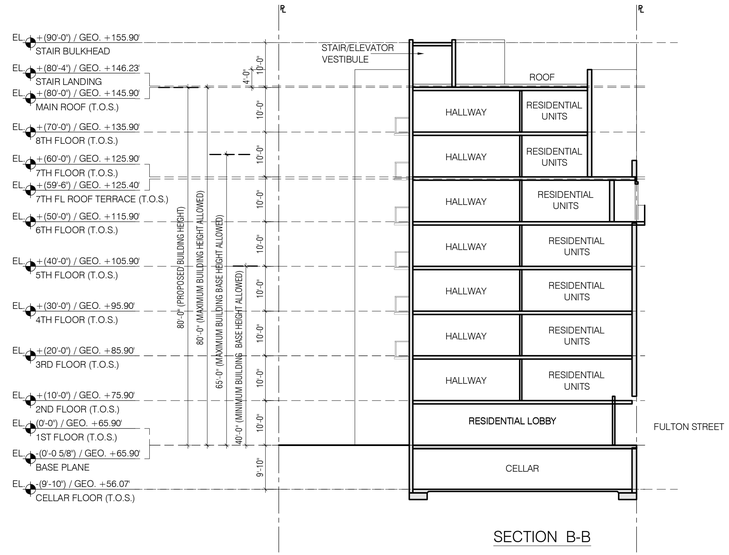
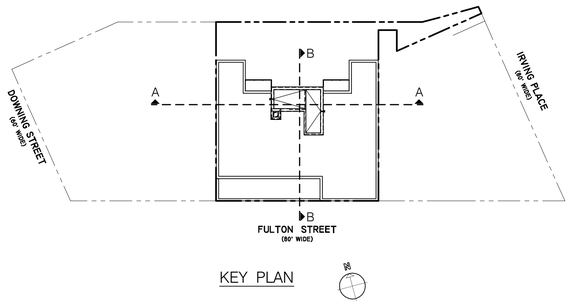


SECTION A-A



SECTION B-B



KEY PLAN

3 BUILDING SECTION DIAGRAMS

Z-004.00 — 1/16" = 1'-0"

FRONT WALL DORMER CALCULATIONS AS PER ZR 23-621(c):

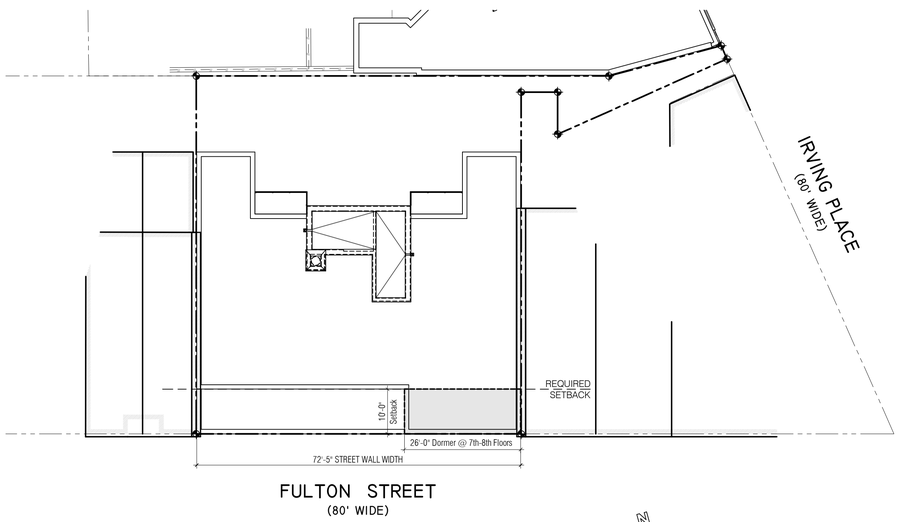
Min. Required Setback = 10'-0" (Wide Street)
Proposed Setback = 10'-0"

(7th FLOOR)

Street Wall Width = 72'-5"
Dormer Height Above Max. Permitted Base Height = 5'-4" = 5.33% Reduction
Max. Allowed Dormer Width = 60% x 72'-5" = 43'-5 3/8"
Reduced Dormer Width = 5.33% x 72'-5"= 3'-10 3/8"
Max. Permitted Dormer Width = 43'-5 3/8" - 3'-10 3/8" = 39'-7 1/8"
Proposed Dormer Width = 26'-0" < 39'-7 1/8" (Complies)

(8th FLOOR)

Street Wall Width = 72'-5"
Dormer Height Above Max. Permitted Base Height = 15'-0" = 15% Reduction
Max. Allowed Dormer Width = 60% x 72'-5" = 43'-5 3/8"
Reduced Dormer Width = 15% x 72'-5"= 10'-10 3/8"
Max. Permitted Dormer Width = 43'-5 3/8" - 10'-10 3/8" = 32'-7"
Proposed Dormer Width = 26'-0" < 32'-7" (Complies)

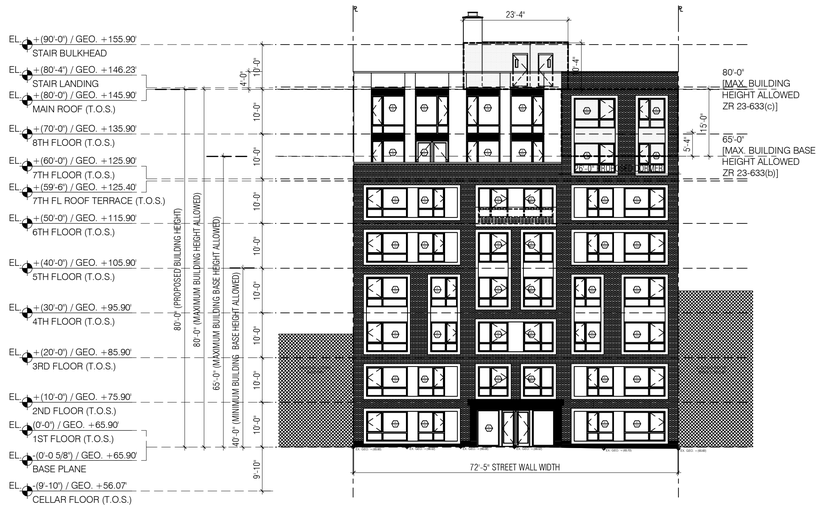


1 DORMER DIAGRAM (PLAN)

Z-004.00 — 1/16" = 1'-0"

STAIR/ELEVATOR BULKHEAD CALCULATIONS (FULTON STREET):

AS PER ZR 23-62 PERMITTED OBSTRUCTIONS (g):
MAXIMUM PERMITTED AGGREGATE OBSTRUCTION WIDTH = 30'-0"
MAXIMUM SF OF PERMITTED OBSTRUCTIONS = 4 x STREET WALL WIDTH = 4 x 72'-5"= 579.3 SF
PROPOSED AGGREGATE PERMITTED OBSTRUCTION WIDTH = 23'-4"
PROPOSED AVERAGE BULKHEAD HEIGHT ABOVE BUILDING HEIGHT = 10'-4"
PROPOSED SF OF PERMITTED OBSTRUCTIONS = 23'-4" x 10'-4" = 241.0 SF < 579.3 SF OK



2 BUILDING HEIGHT & OBSTRUCTIONS DIAGRAM (FULTON STREET)

Z-004.00 — 1/16" = 1'-0"

KEY PLAN

BLOCK: 1992 LOTS: 5,6,7,8,9

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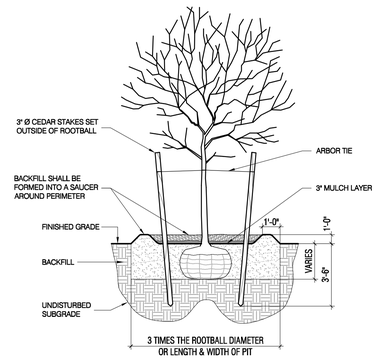
GUIDELINES FOR STREET TREE PLANTING
AS PER THE CITY OF NEW YORK PARKS AND RECREATION

GUIDELINES FOR STREET TREE PLANTING:
THE FOLLOWING GUIDELINES ARE ISSUED TO LIMIT POSSIBLE REQUESTS FOR TREE PLANTING WHICH MIGHT BE INAPPROPRIATE FOR A NUMBER OF REASONS. NO GUIDELINES CAN BE COMPLETE OR ABSOLUTE, HOWEVER, AND THEREFORE, ALL SITES SUBMITTED BY COMMUNITY BOARDS WILL BE INSPECTED IN THE FIELD BY DEPARTMENT OF PARKS URBAN FORESTERS. IT IS OUR EXPERIENCE THAT ONLY HALF THE SITES REQUIRED FOR TREE PLANTING ARE IN FACT SUITABLE. SELECTION AMONG THE SEVERAL VARIETIES OF TREES SUITABLE AND AVAILABLE FOR PLANTING ALONG STREETS WILL BE MADE BY DEPARTMENTAL FORESTERS. FACTORS INFLUENCING THE SELECTION ARE MANY, INCLUDING THE TYPES OF TREES ALREADY ON THE BLOCK AND THE EVENTUAL SPREAD OF THE TREE BRANCHES, WHICH WOULD AFFECT THE TREE SPACING AS WELL AS THE PROXIMITY TO STREET LIGHTS, FIRE ESCAPES, TRAFFIC SIGNS, ETC.

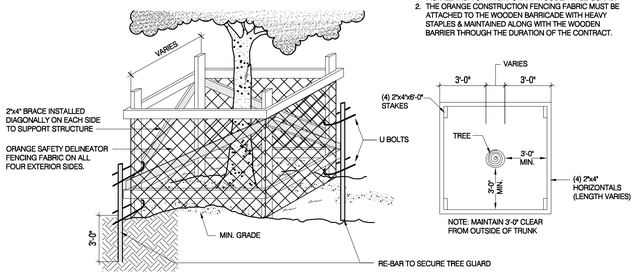
TREE PIT NOTES:
1. TREE PITS SHALL NOT BE PLACED DIRECTLY IN FRONT OF A BUILDING ENTRANCE IN ORDER TO PERMIT EASY ACCESS BY THE FIRE DEPARTMENT.
2. MINIMUM TREE PIT SIZE, NORMAL TO WIDE SIDEWALKS: 4 FEET X 5 FEET X 3 FEET DEEP. NARROW SIDEWALKS: 3 FEET X 6 FEET X 3 FEET DEEP.
3. EXISTING TREE PITS SHALL BE EXPANDED TO 5 FEET X 10 FEET.
4. DISTANCE FROM ANOTHER TREE (CENTER TO CENTER OF PIT): 20 TO 40 FEET DEPENDING ON TREE VARIETY AND OTHER CONDITIONS ON THE BLOCK. (MIN. 25FT. UNLESS GINKGO)
5. DISTANCE FROM A STREET LIGHT: ABOUT 25 FT (VARIES WITH TREE SPECIES)
6. DISTANCE FROM A STOP SIGN: 40 FT.
7. DISTANCE FROM A TRAFFIC SIGN: 6 FEET. TREES SHOULD NOT BLOCK VISIBILITY OF TRAFFIC SIGN IN THE DIRECTION OF MOVING TRAFFIC.
8. DISTANCE FROM A PARKING METER: NO MORE THAN 5 FEET BEHIND METER TO GIVE ACCESS TO CAR DOOR AND LIMIT DISTANCE FROM TREE.(WHERE HOOD IS)
9. DISTANCE FROM A GAS OR WATER VALVE IN THE SIDEWALK: 2 FEET FROM THE EDGE OF THE PIT.
10. DISTANCE FROM AN OIL FILL PIPE IN THE SIDEWALK: 4 FEET.
11. DISTANCE FROM A COAL CHUTE: 6 FEET
12. DISTANCE FROM A FIRE HYDRANT: 5 FEET FROM THE EDGE OF A PIT.
13. DISTANCE FROM A CURB CUT OR DRIVEWAY: 7 FEET (VARIABLE)
14. DISTANCE FROM THE BUILDING LINE OR PROPERTY LINE AT A STREET INTERSECTION: 40 FEET.
15. SIDEWALKS MUST REMAIN A MINIMUM OF 6 FEET WIDE BETWEEN TREE PITS AND ANY OPPOSITE OBSTRUCTION, EG. BUILDING WALLS, STOOPS, RAILINGS, ETC. WIDTH SHOULD BE WIDER IF THE SIDEWALK IS HEAVILY USED.
16. ALL TREE PITS MUST BE CONTIGUOUS TO THE STREET CURB (EXCEPT AS NOTED)
17. TREES MAY BE PLANTED ON EITHER SIDE OF SIDEWALKS (IF ANY EXIST) IN LAWN AREAS WHERE THERE IS SUFFICIENT ROOM BETWEEN THE PROPERTY LINE AND THE STREET CURB. THOSE TREE PITS MAY BE SEEDED FOR GRASS IN LIEU OF PAVING WITH CONCRETE OR GRANITE BLOCKS.

PLANTING NOTES:
1. WRITTEN NOTIFICATION WILL BE MADE TO THE DEPARTMENT OF PARKS AND RECREATION PRIOR TO THE COMMENCEMENT OF SUCH WORK.
2. NO DELETERIOUS, CAUSTIC OR ACID MATERIALS SHALL BE DUMPED OR MIXED WITHIN 10' OF SUCH TREE.
3. ALL PLANT MATERIAL TO BE VIGOROUS, FREE OF INJURY OR DEFECTS. ALL PLANT MATERIAL TO BE TRUE REPRESENTATIVES OF THEIR SPECIES.
4. ALL B&B MATERIAL IS TO HAVE BALL/PLANT SIZE RELATIONSHIP AS SPECIFIED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
5. NO SUBSTITUTION WILL BE ACCEPTED UNLESS AUTHORIZED BY THE LANDSCAPE ARCHITECT.
6. THE LANDSCAPE ARCHITECT MAY REJECT ANY MATERIAL WHICH DOES NOT REPRESENT SPECIES AS OUTLINED IN PLANT LIST.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING QUANTITIES SHOWN ON THE PLANS AND MUST INSTALL MATERIAL IN A WORKMANLIKE MANNER.
8. ALL TREES TO BE PLANTED 5'-0" MIN. FROM DRAINAGE STRUCTURES AND DRAINAGE LINES. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING LOCATION OF DRAINAGE STRUCTURES ON SITE.

EXISTING TREE NOTES:
1. STREET TREES THAT HAVE BRANCHES NEAR BUILDINGS OR BRANCHES WITHIN CONSTRUCTION AREAS ARE NOT ALLOWED TO BE PRUNED WITHOUT A PARKS AND RECREATION ISSUED PRUNING PERMIT.
2. WHEN WORKING AROUND EXISTING TREES, ROOTS SHALL NOT BE CUT, AND NO WORK OR STOCKPILING OF MATERIALS SHALL BE PERFORMED WITHIN THE TREE PITS.
3. PURSUANT TO TITLE 56 OF THE RULES OF THE CITY OF NEW YORK SECTION 1-04(b)(1)(a), THE FINE FOR DAMAGES TO A STREET TREE RANGES FROM $1000 TO $4000.
4. ALL EXISTING STREET TREES MUST BE PROTECTED THROUGHOUT THE CONSTRUCTION PROCESS. SEE TEMPORARY WOODEN TREE GUARD DETAIL BELOW.
5. INSTALLATION OF NEW SIDEWALK AND CURB MUST BE PERFORMED BY HAND UNDER THE DRIP LINE OF STREET TREES TO PREVENT DAMAGE TO THE ROOT ZONE.
6. IF NECESSARY, NEW SIDEWALKS MUST BE RAMPED OVER EXISTING ROOTS.
7. CORRECTIVE PRUNING IS REQUIRED FOR ALL TREES DAMAGED OR IMPROPERLY PRUNED DURING THE COURSE OF CONSTRUCTION, AND MUST BE PERFORMED BY A QUALIFIED AND INSURED TREE COMPANY WITH A BROOKLYN FORESTRY APPROVED AND ISSUED PERMIT.
8. IN ORDER TO PREVENT DAMAGE TO THE ROOTS OF THE EXISTING TREES, MINIMIZE CONSTRUCTION TRAFFIC TO A FEW PATHS WHICH ARE TO BE COVERED WITH 6 TO 10 INCHES OF WOOD CHIPS AND STEEL PLATES OVER THE CHIPS.



2 A-010.00 TREE PLANTING & STAKE DETAIL
N.T.S.



3 A-010.00 TEMPORARY WOODEN TREE GUARD
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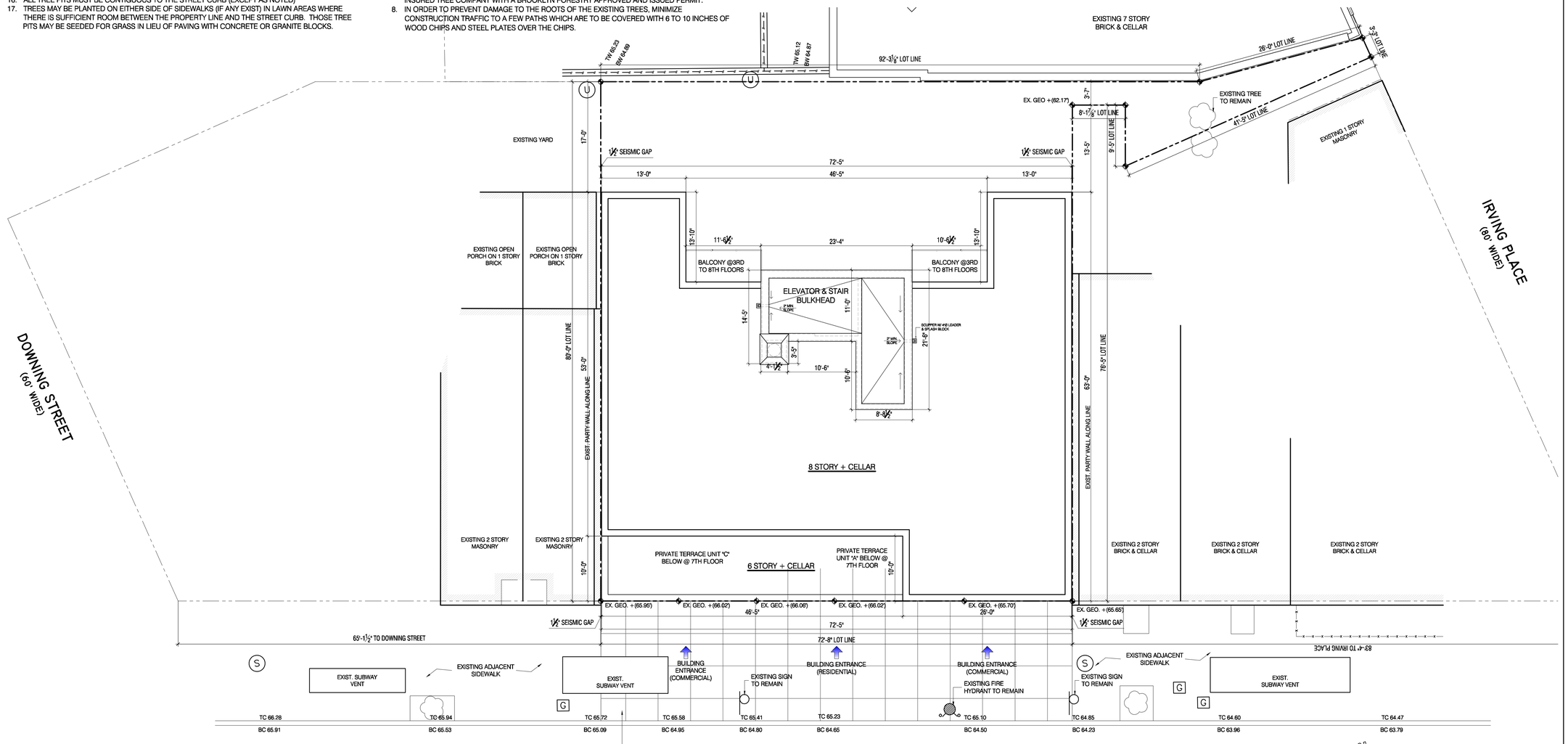
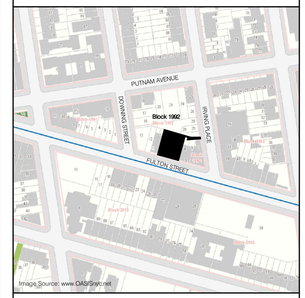


1 A-010.00 SITE PLAN
1/8" = 1'-0"

KEY PLAN



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E-MAIL:KARL@KFARCHITECT.COM

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SITE PLAN

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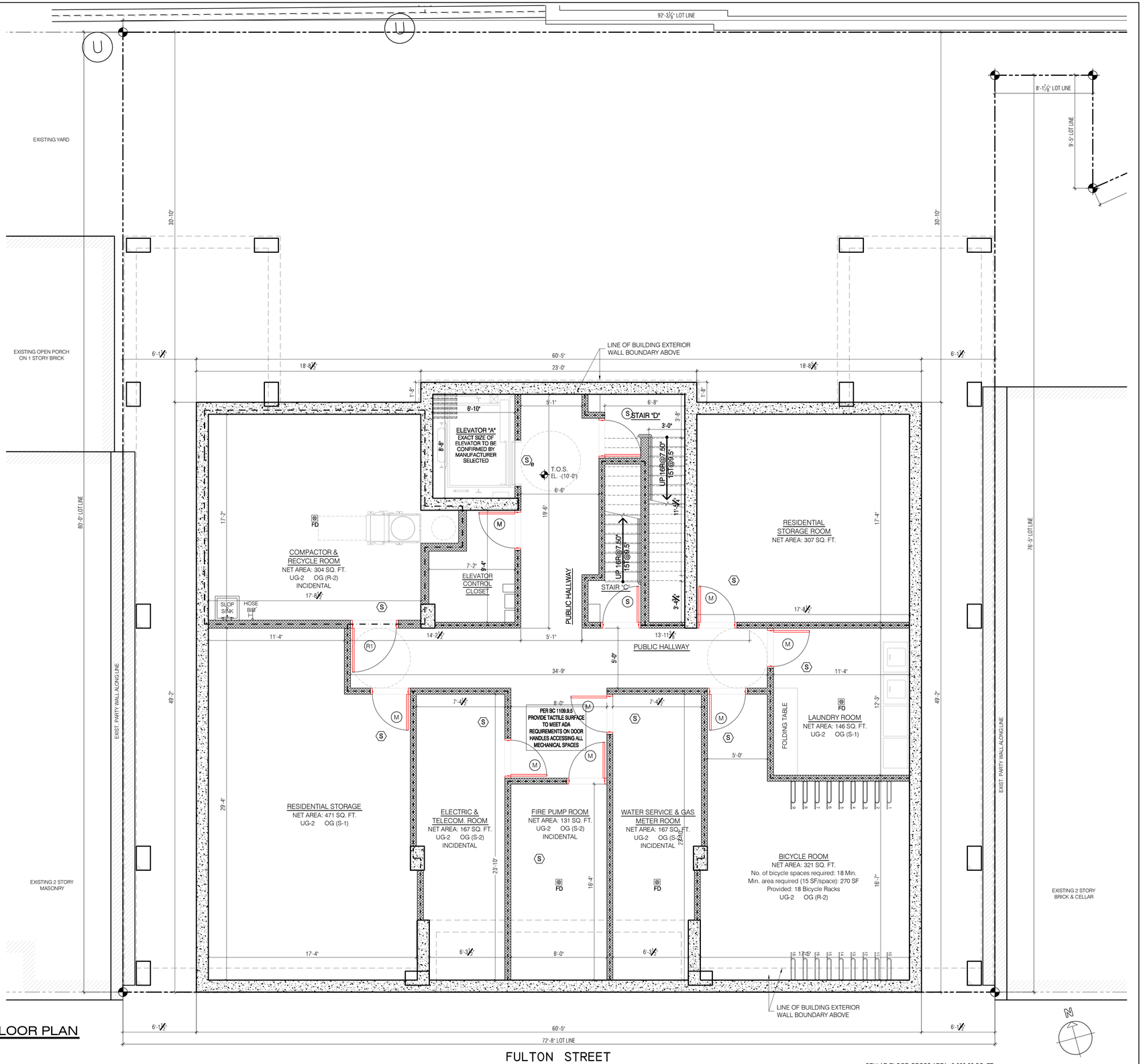
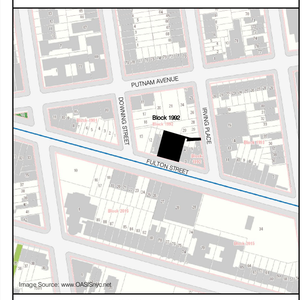


1 CELLAR FLOOR PLAN
A-100.00 1/4" = 1'-0"

KEY PLAN



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CELLAR FLOOR PLAN

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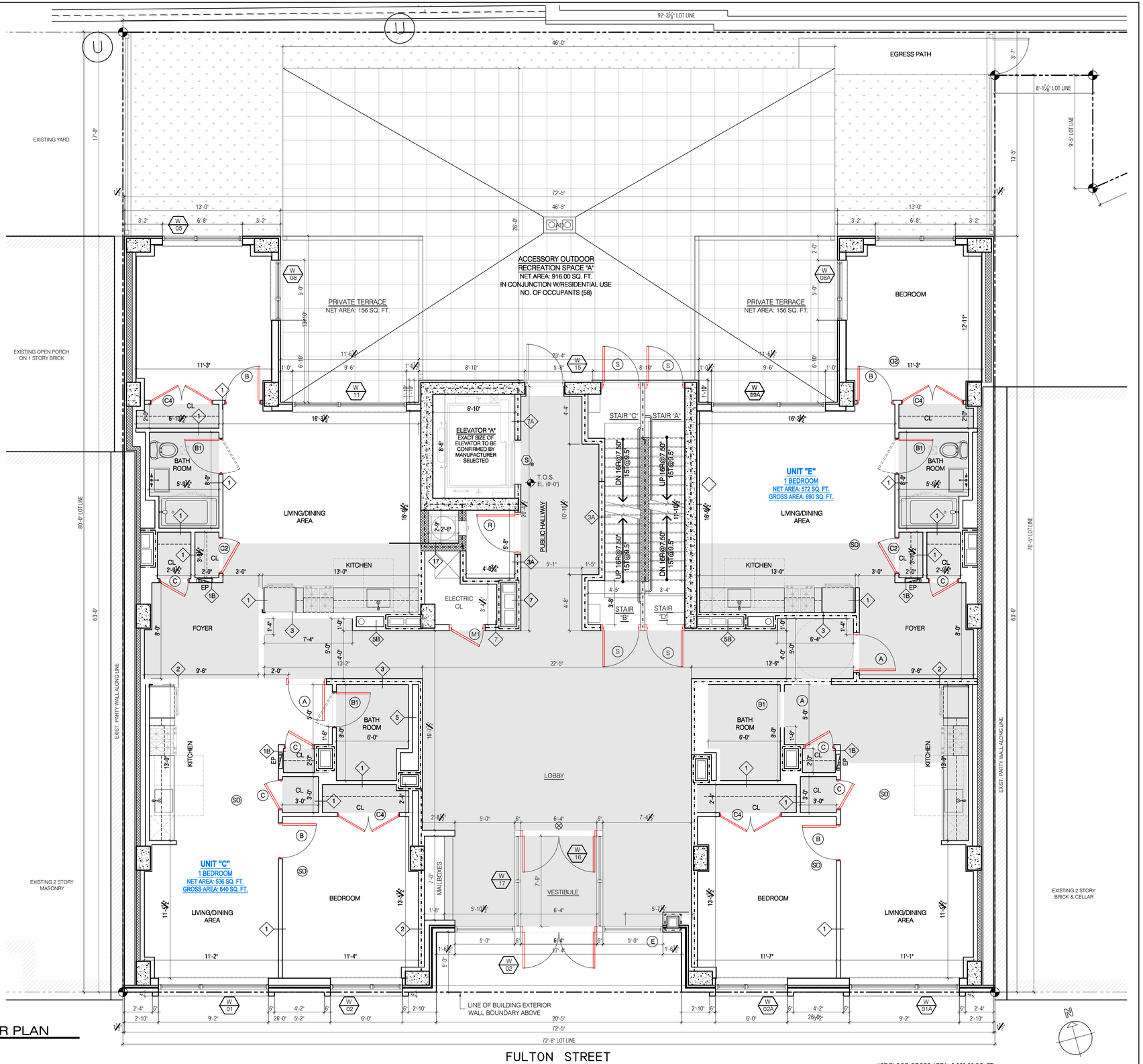
drawn:	drawing no.: A-100.00
checked: KF	



1 1ST FLOOR PLAN
A-101.00 1/4" = 1'-0"

KEY PLAN

BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
1		06/28/13	ISSUED TO DOB

ISSUES/REVISIONS

MEP ENGINEER:
TSF ENGINEERING PC
200 Park Avenue South, Suite 1020, New York, NY 10003
Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
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

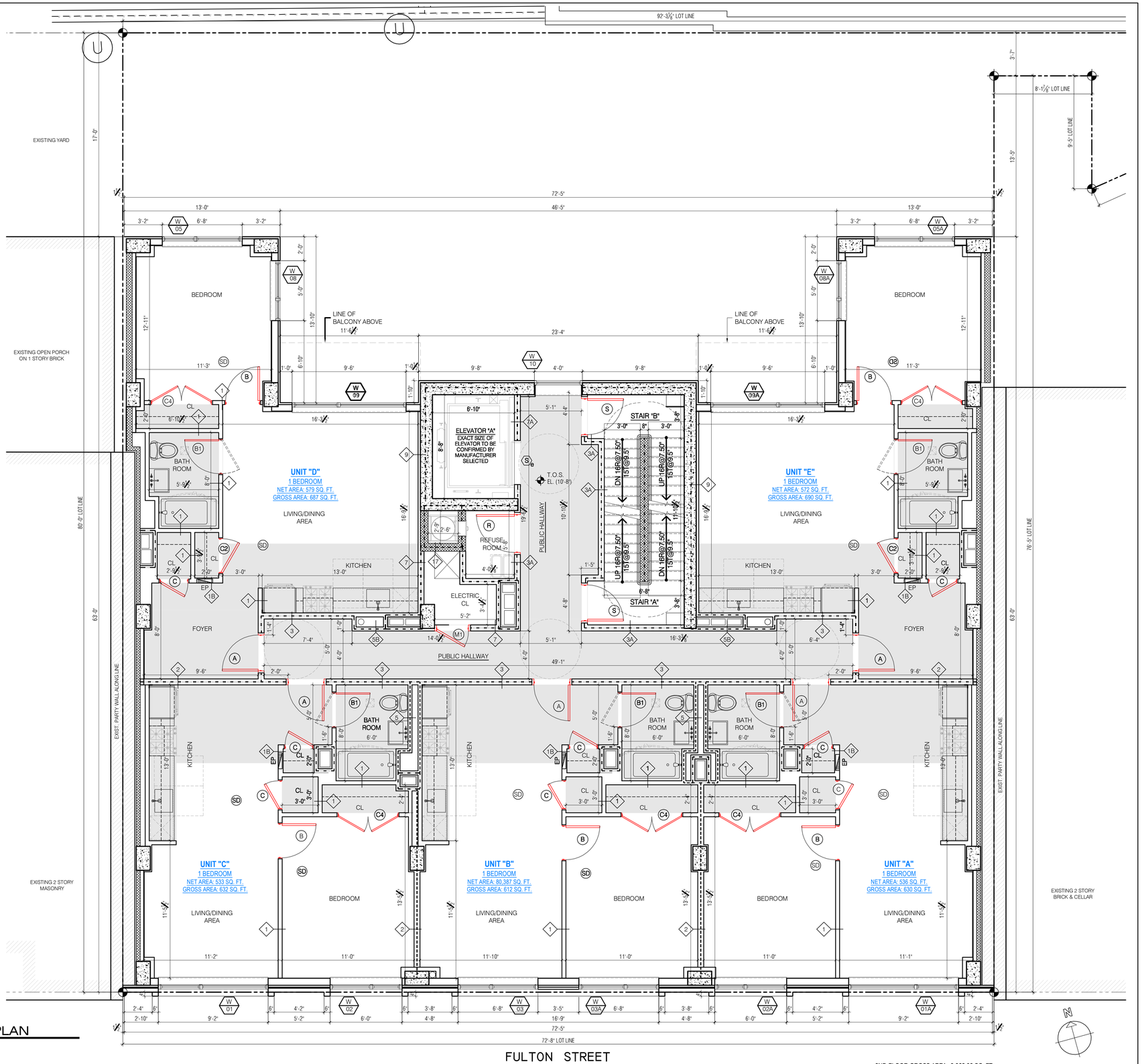
SEAL
REGISTERED ARCHITECT
KARL FISCHER
STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
1ST FLOOR PLAN

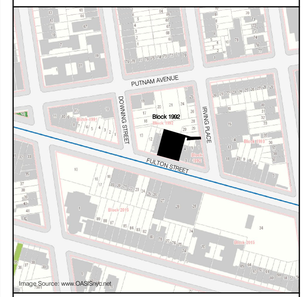
dob no
000000000

scale: 1/4" = 1'-0"	project no.: 13-06
date: 03/2013	sheet no.: -- OF
drawn:	drawing no.: A-101.00
checked: KF	



1 2ND FLOOR PLAN
A-102.00 1/4" = 1'-0"

KEY PLAN



BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
1		06/28/13	ISSUED TO DOB

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TSF ENGINEERING PC
200 Park Avenue South, Suite 1020, New York, NY 10003
Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
AIA RAIC
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 028282 STATE OF NEW YORK

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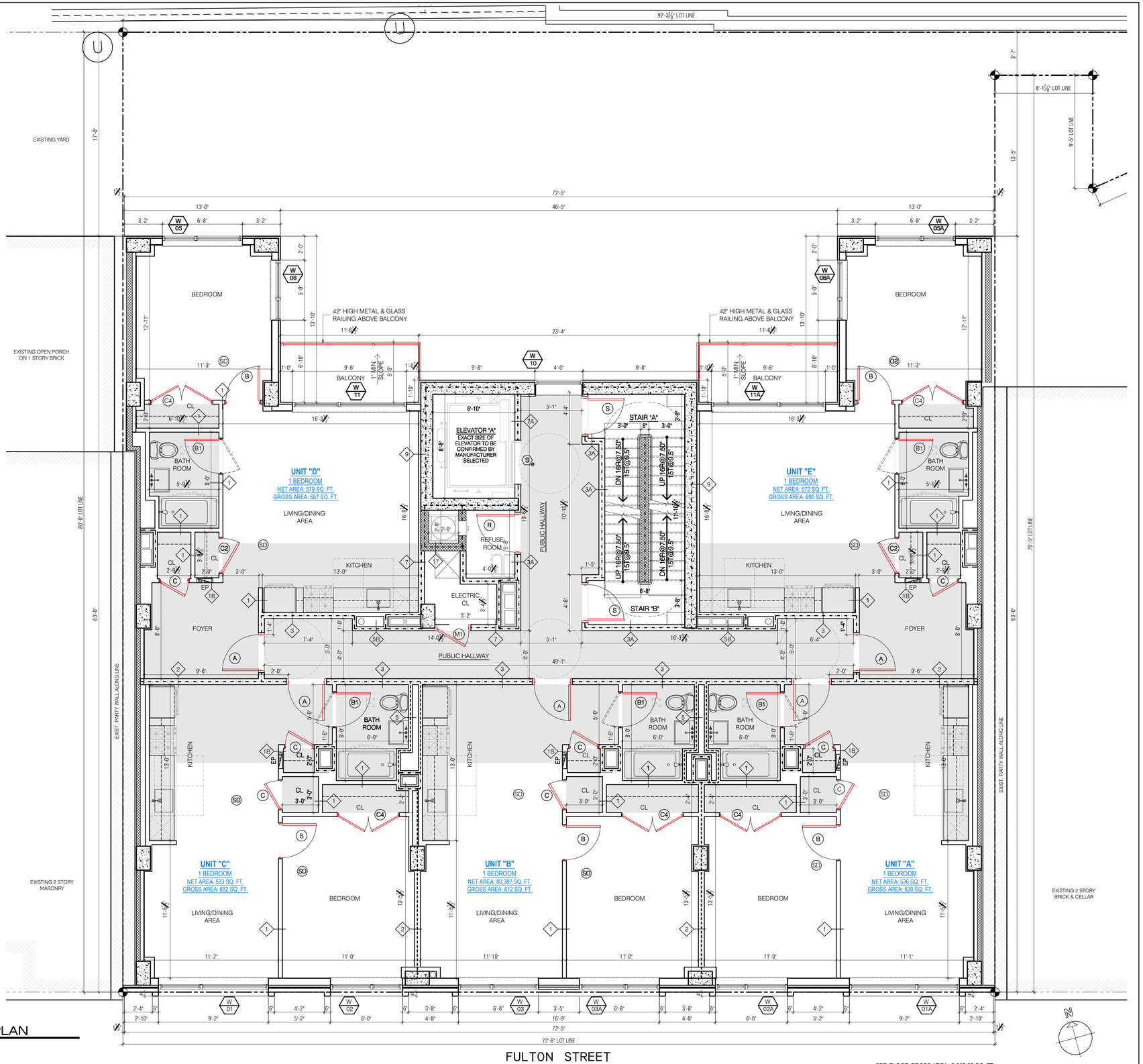
RESIDENTIAL DEVELOPMENT
1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
2ND FLOOR PLAN

dob no
000000000

scale: 1/4" = 1'-0"	project no.: 13-06
date: 03/2013	sheet no.: -- OF
drawn:	drawing no.: A-102.00
checked: KF	



1 3RD FLOOR PLAN
A-103.00 1/4" = 1'-0"

KEY PLAN

BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
1		06/28/13	ISSUED TO DOB

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MEP ENGINEER:
TSF ENGINEERING PC
200 Park Avenue South, Suite 1020, New York, NY 10003
Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
AIA OAA RAIC AA
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

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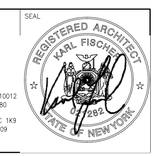
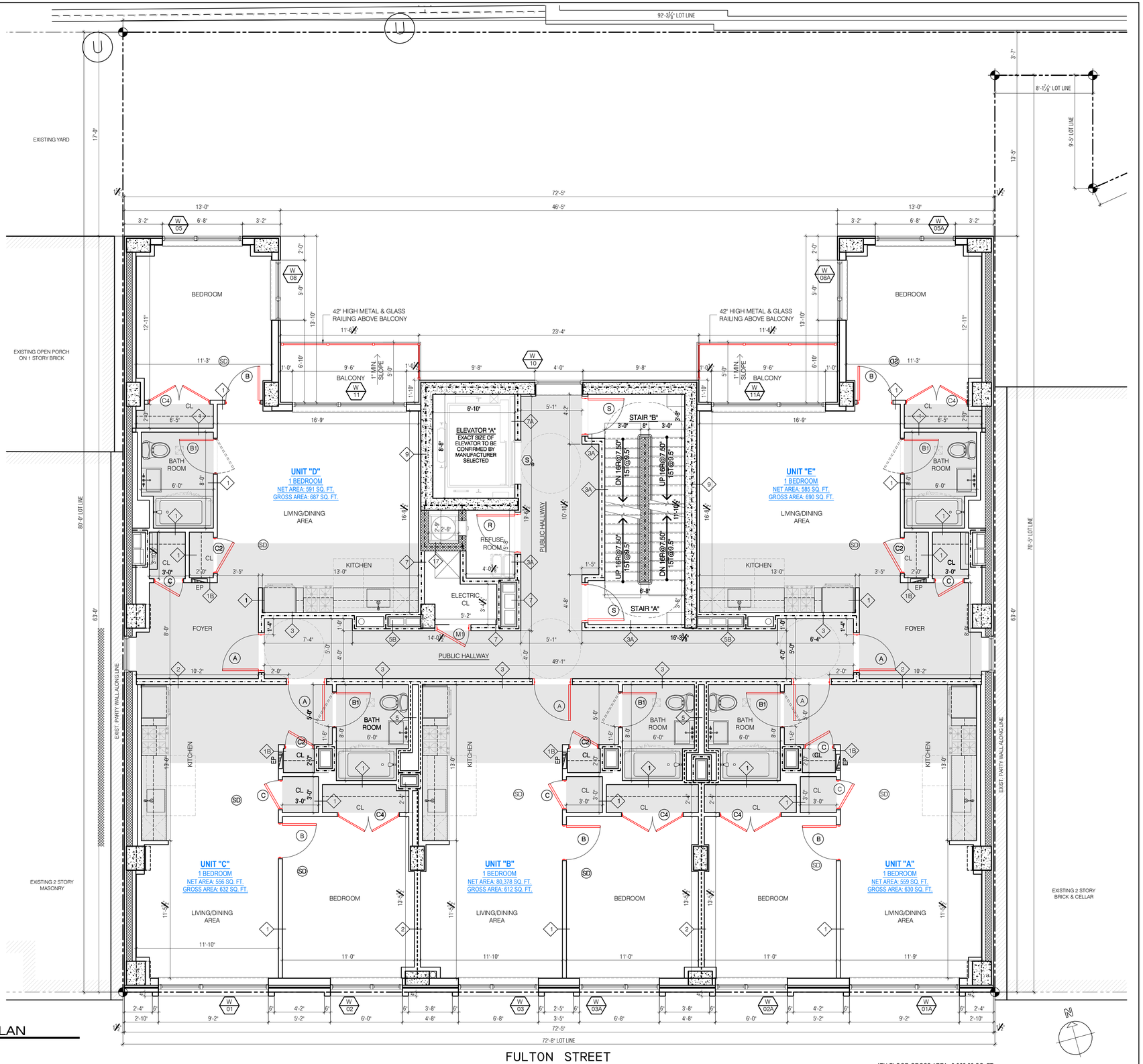


project title
RESIDENTIAL DEVELOPMENT
1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
3RD FLOOR PLAN

dob no
000000000

scale: 1/4" = 1'-0"	project no.: 13-06
date: 03/2013	sheet no.: -- OF
drawn:	drawing no.: A-103.00
checked: KF	



1 4TH FLOOR PLAN
A-104.00 1/4" = 1'-0"

KEY PLAN

BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
1		06/28/13	ISSUED TO DOB

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TSF ENGINEERING PC
200 Park Avenue South, Suite 1020, New York, NY 10003
Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
AIA/ OAA 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

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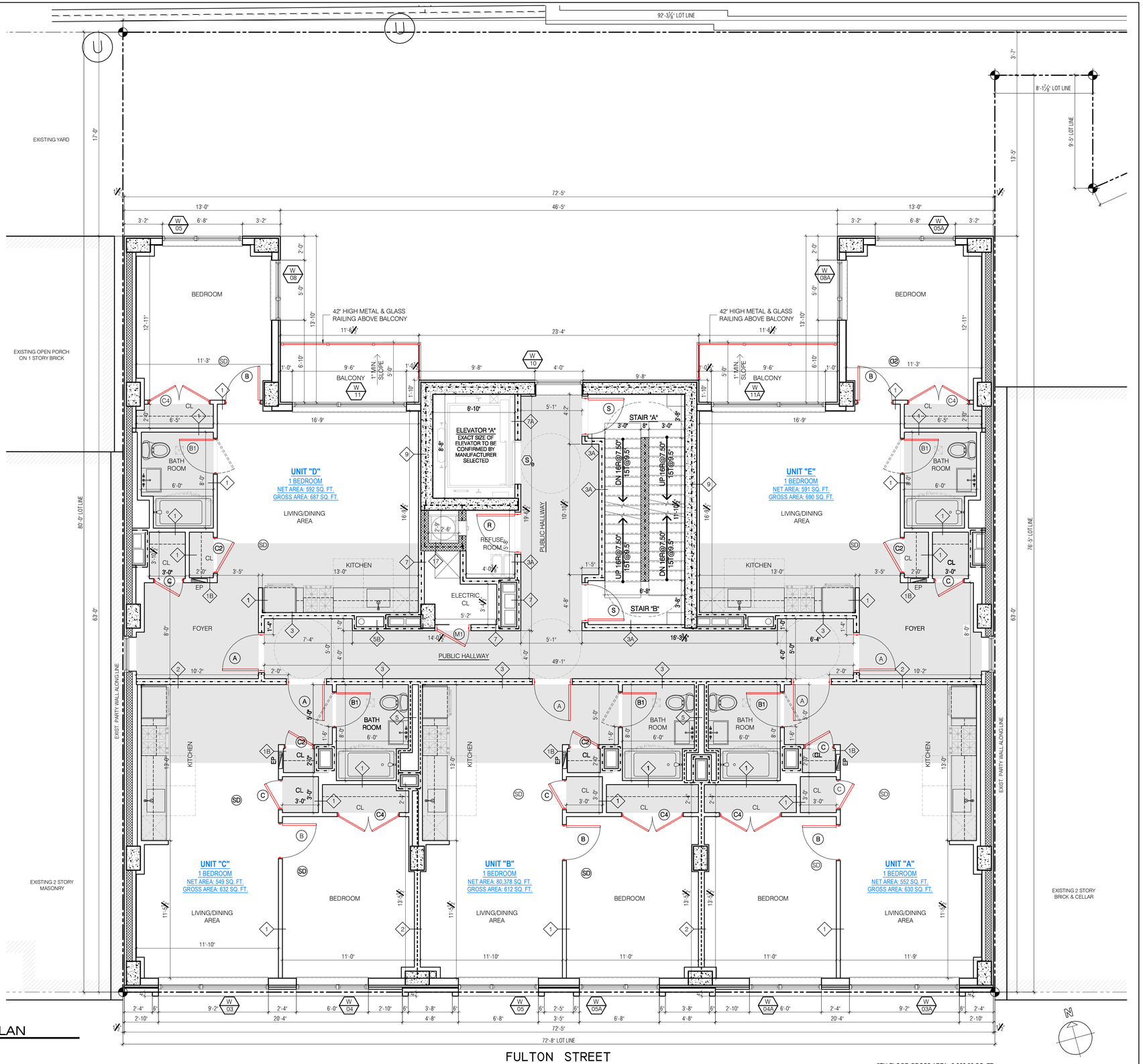
project title
RESIDENTIAL DEVELOPMENT
1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
4TH FLOOR PLAN

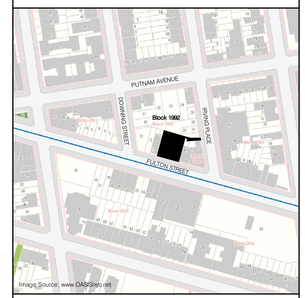
dob no
000000000

scale: 1/4" = 1'-0"	project no.: 13-06
date: 03/2013	sheet no.: ---- OF
drawn:	drawing no.: A-104.00
checked: KF	



1 5TH FLOOR PLAN
A-105.00 1/4" = 1'-0"

KEY PLAN



BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
1		06/28/13	ISSUED TO DOB

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MEP ENGINEER:
TSF ENGINEERING PC
200 Park Avenue South, Suite 1020, New York, NY 10003
Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
AIA OAA RAIC AA
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

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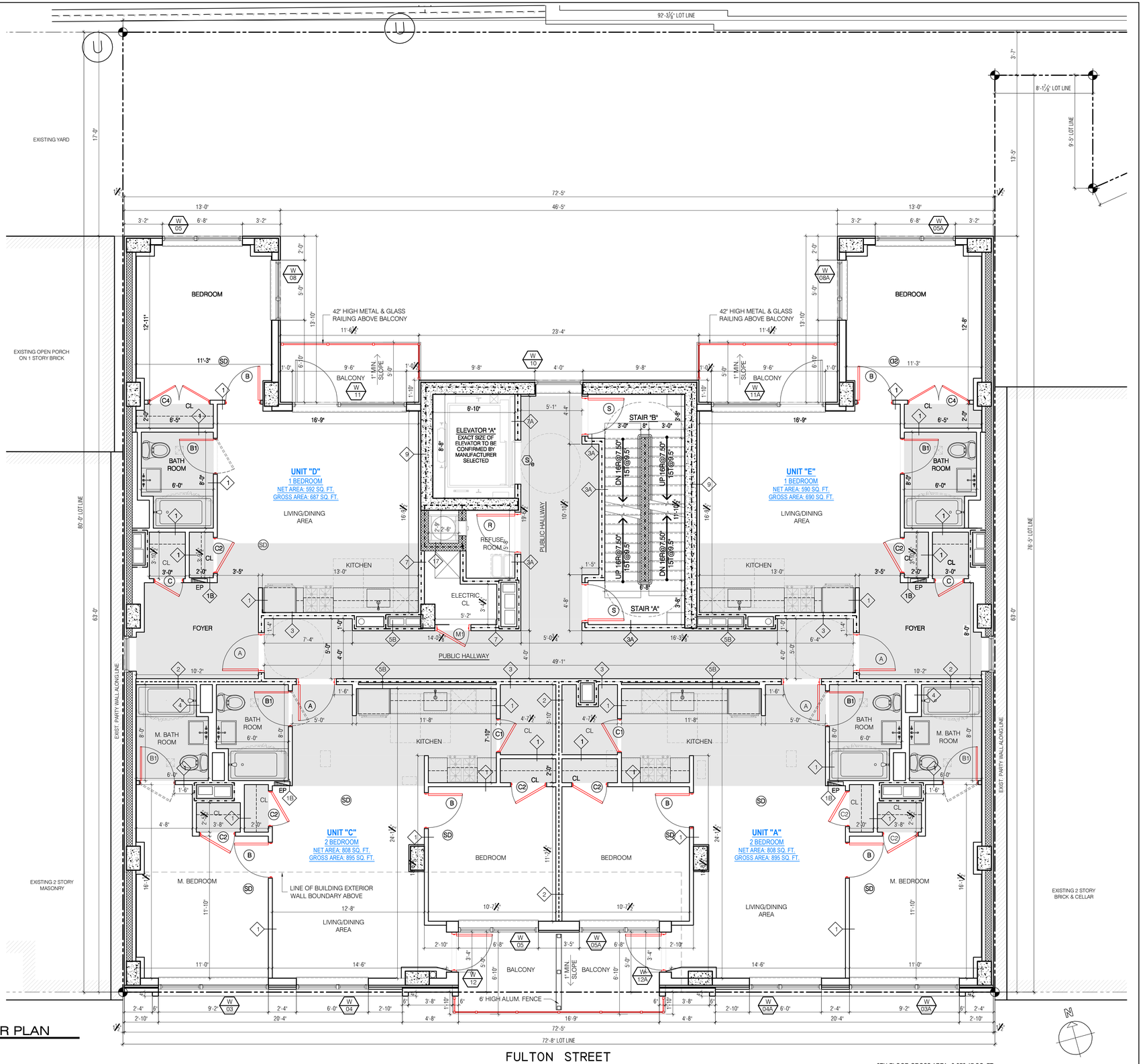
project title
RESIDENTIAL DEVELOPMENT
1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
5TH FLOOR PLAN

dob no
000000000

scale: 1/4" = 1'-0"	project no.: 13-06
date: 03/2013	sheet no.: ---- OF
drawn:	drawing no.: A-105.00
checked: KF	



1 6TH FLOOR PLAN
A-106.00
1/4" = 1'-0"

KEY PLAN

BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
1		06/28/13	ISSUED TO DOB

ISSUES/REVISIONS

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TSF ENGINEERING PC
200 Park Avenue South, Suite 1020, New York, NY 10003
Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
OIQ OAA 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

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REGISTERED ARCHITECT KARL FISCHER 028282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
6TH FLOOR PLAN

dob no
000000000

scale: 1/4" = 1'-0"	project no.: 13-06
date: 03/2013	sheet no.: ---- OF
drawn:	drawing no.: A-106.00
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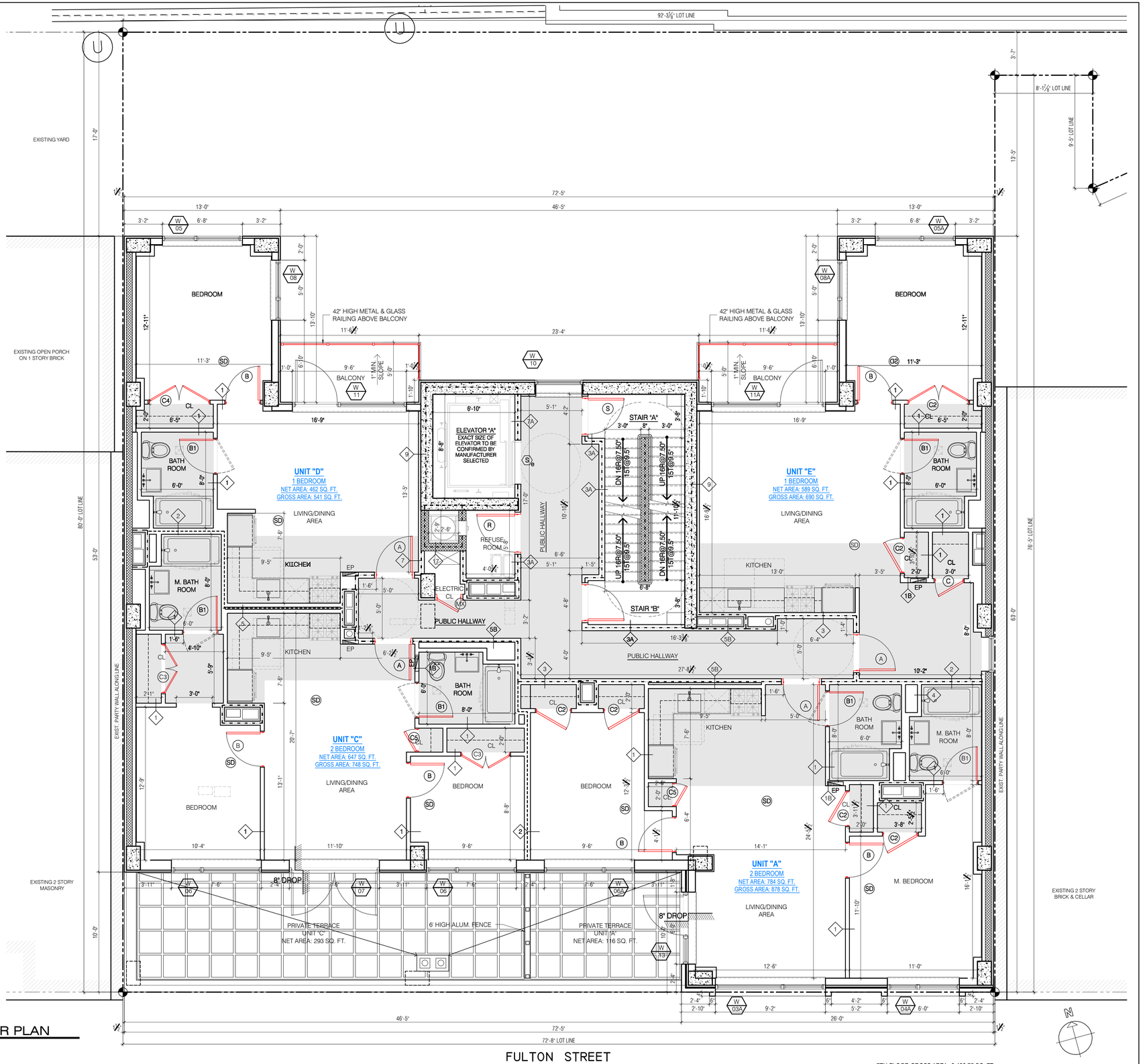
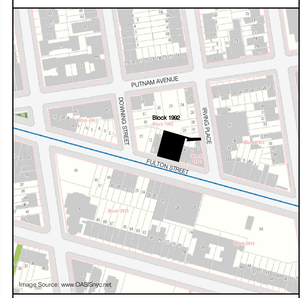


1 7TH FLOOR PLAN
A-107.00
1/4" = 1'-0"

7TH FLOOR GROSS AREA: 3,498.75 SQ. FT.

KEY PLAN



BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
1		06/28/13	ISSUED TO DOB

ISSUES/REVISIONS

MEP ENGINEER:
TSF ENGINEERING PC
200 Park Avenue South, Suite 1020, New York, NY 10003
Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
OIQ OAA 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

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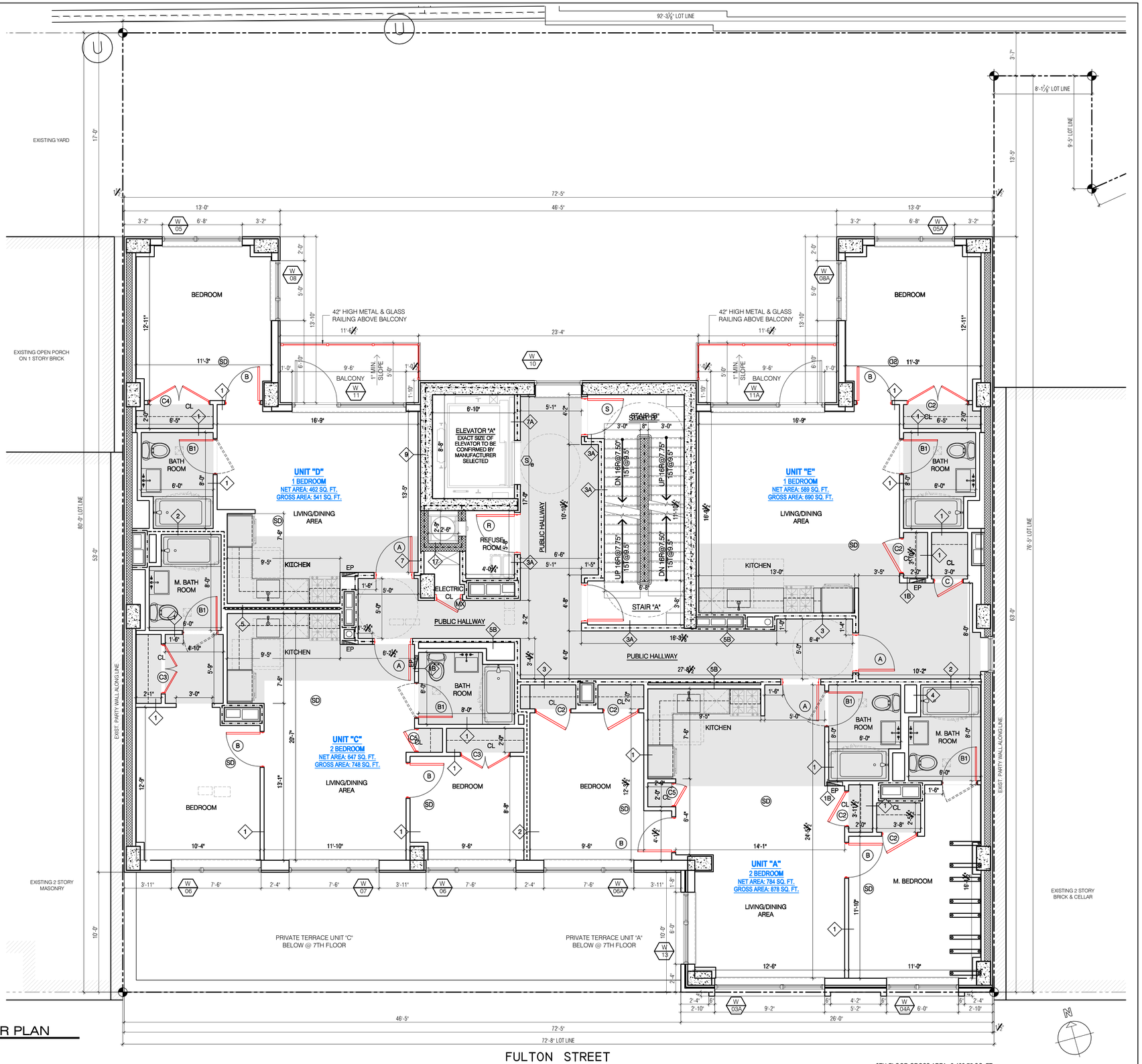
project title
RESIDENTIAL DEVELOPMENT
1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
7TH FLOOR PLAN

dob no
000000000

scale: 1/4" = 1'-0"	project no.: 13-06
date: 03/2013	sheet no.: -- OF
drawn:	drawing no.: A-107.00
checked: KF	



1 8TH FLOOR PLAN
A-108.00 1/4" = 1'-0"

8TH FLOOR GROSS AREA: 3,498.75 SQ. FT.

KEY PLAN

BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
1		06/28/13	ISSUED TO DOB

ISSUES/REVISIONS

MEP ENGINEER:
TSF ENGINEERING PC
200 Park Avenue South, Suite 1020, New York, NY 10003
Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
AIA OAA 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
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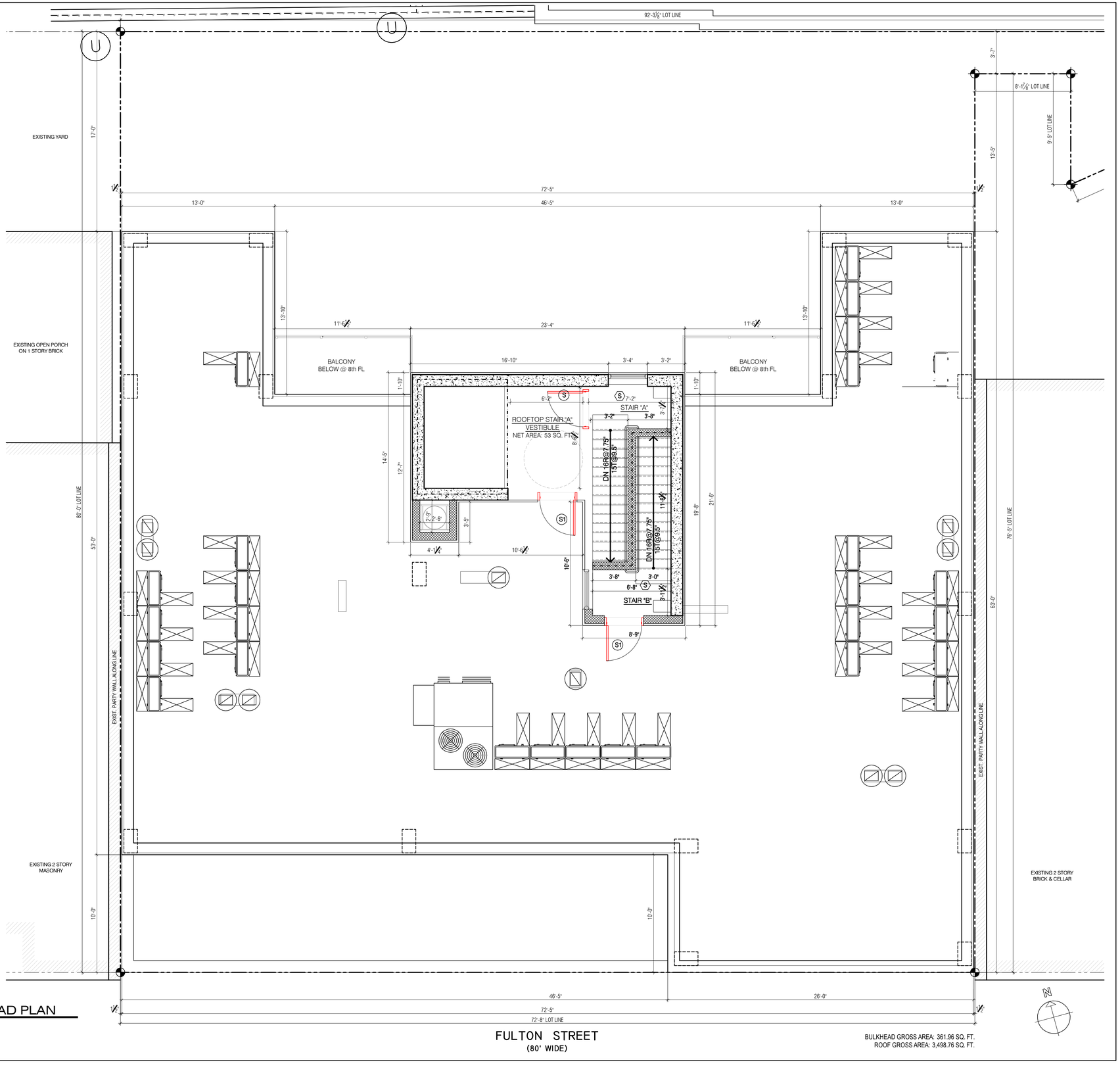
project title
RESIDENTIAL DEVELOPMENT
1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
8TH FLOOR PLAN

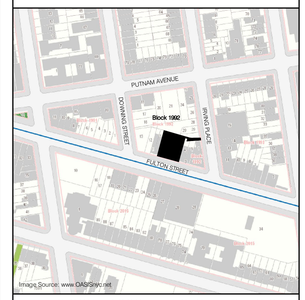
dob no
000000000

scale: 1/4" = 1'-0"	project no.: 13-06
date: 03/2013	sheet no.: -- OF
drawn:	drawing no.: A-108.00
checked: KF	



1 ROOF & BULKHEAD PLAN
A-109.00 1/4" = 1'-0"

KEY PLAN



BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
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Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
OAQ OAA 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

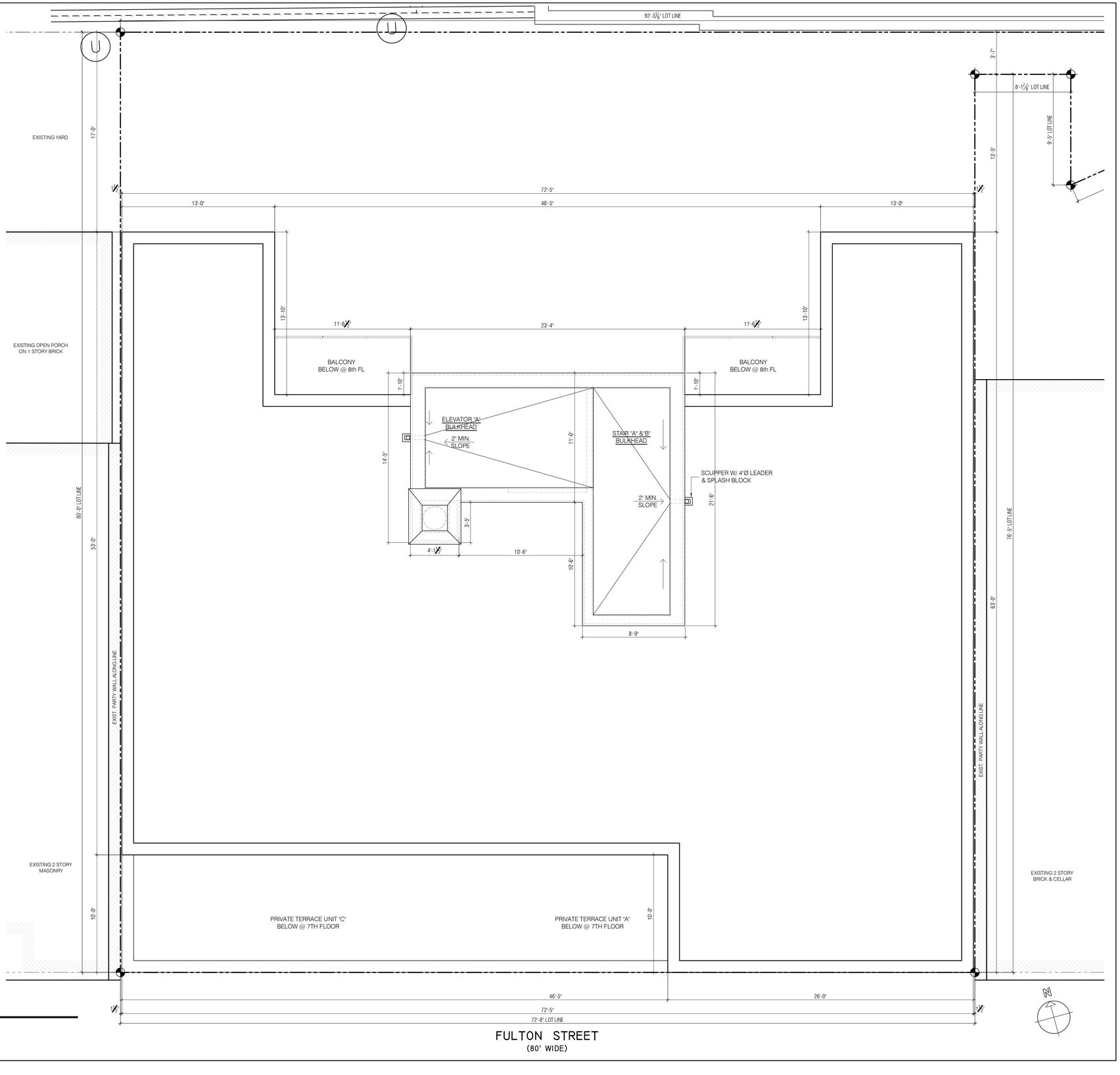
SEAL
REGISTERED ARCHITECT KARL FISCHER 027282 STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
ROOF & BULKHEAD PLAN

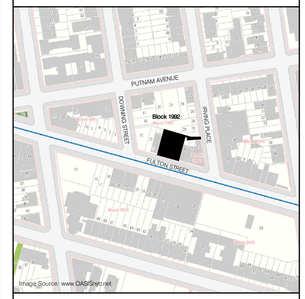
dob no
000000000

scale 1/4" = 1'-0"	project no. 13-06
date 03/2013	sheet no. -- OF
drawn	drawing no. A-109.00
checked KF	



1 BULKHEAD ROOF PLAN
A-110.00 1/4" = 1'-0"

KEY PLAN



BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
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TSF ENGINEERING PC
200 Park Avenue South, Suite 1020, New York, NY 10003
Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
OHO OAA 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
027282
STATE OF NEW YORK

project title
RESIDENTIAL DEVELOPMENT
1045 FULTON STREET, BROOKLYN, NY 11238

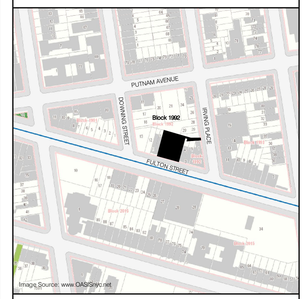
drawing title
BULKHEAD ROOF PLAN

dob no
000000000

scale 1/4" = 1'-0"	project no. 13-06
date 03/2013	sheet no. -- OF
drawn	drawing no. A-110.00
checked KF	

1 A-200.00 ELEVATION (E1) - FULTON STREET
3/16" = 1'-0"

KEY PLAN



BLOCK: 1992 LOTS: 5,6,7,8,9

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Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

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Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
OAQ OAA 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

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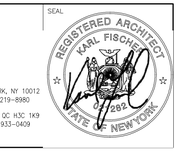


project title
RESIDENTIAL DEVELOPMENT
1045 FULTON STREET, BROOKLYN, NY 11238

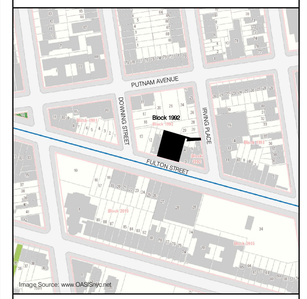
drawing title
ELEVATION (1)

dob no.
000000000

scale 3/16" = 1'-0"	project no. 13-06
date 03/2013	sheet no. ---- OF
drawn	drawing no. A-200.00
checked KF	

1 A-201.00 ELEVATION (E2) - REAR
3/16" = 1'-0"

KEY PLAN



BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
1		06/28/13	ISSUED TO DOB

ISSUES/REVISIONS

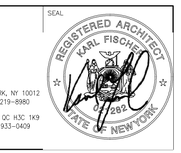
MEP ENGINEER:
TSF ENGINEERING PC
200 Park Avenue South, Suite 1020, New York, NY 10003
Tel: (212) 253-7303 Fax: (212) 253-6512

STRUCTURAL ENGINEER:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
469 Seventh Avenue, 9th Floor, New York, NY 10018
Tel: (212) 986-3700 Fax: (212) 687-6467

CLIENT:
20 Brick Court, Staten Island, NY 10309
Tel: (718) 984-0170 Fax: (718) 233-9664

KARL FISCHER ARCHITECT
OAQ OAA 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

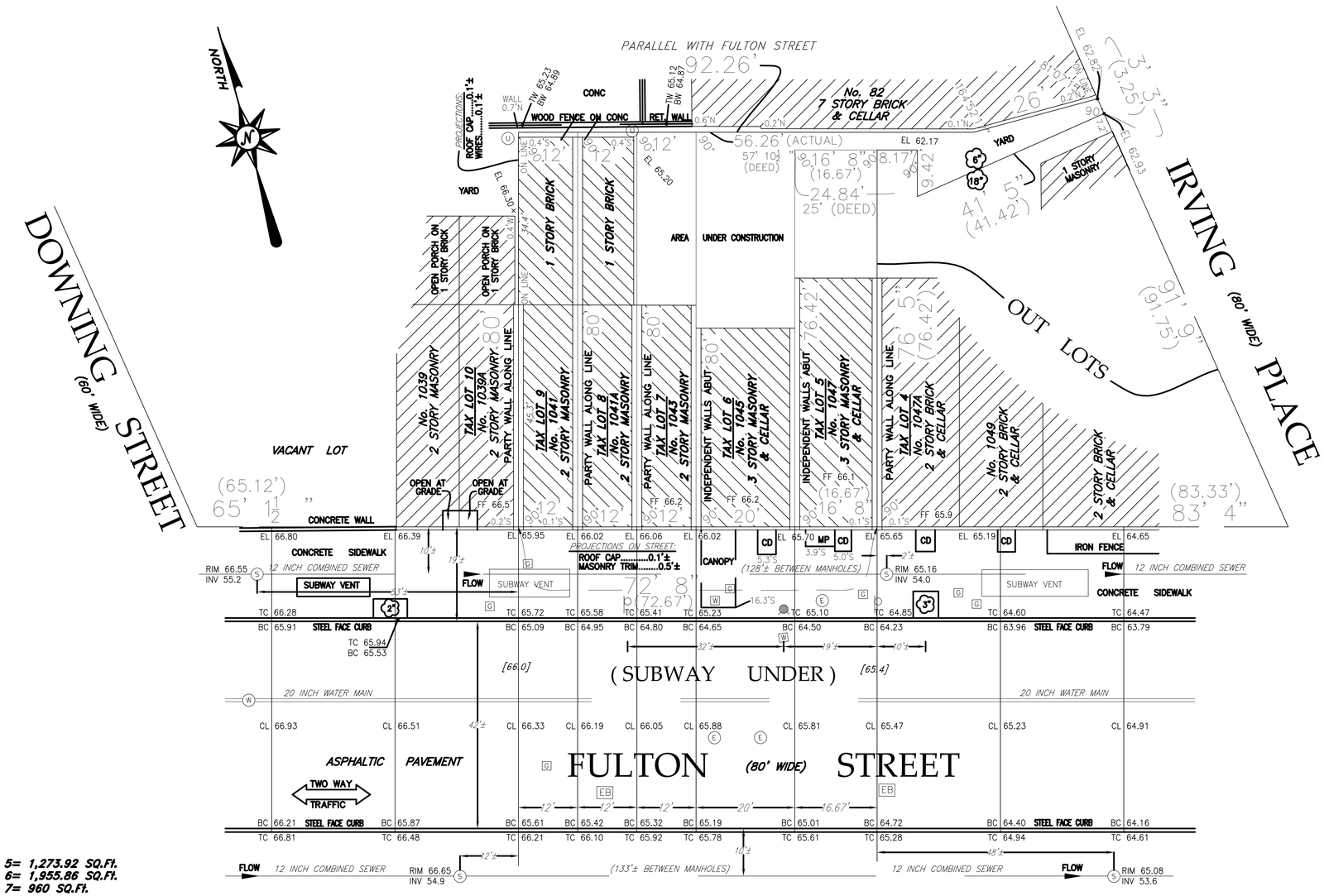


project title
RESIDENTIAL DEVELOPMENT
1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
ELEVATION (2)

dob no.
000000000

scale: 3/16" = 1'-0"	project no.: 13-06
date: 03/2013	sheet no.: ---- OF
drawn:	drawing no.: A-201.00
checked: KF	



AREA OF LOT 5= 1,273.92 SQ.Ft.
AREA OF LOT 6= 1,955.86 SQ.Ft.
AREA OF LOT 7= 960 SQ.Ft.
AREA OF LOT 8= 960 SQ.Ft.
AREA OF LOT 9= 960 SQ.Ft.

TOTAL AREA= 6,109.78 SQ.Ft.

GENERAL NOTES:

1. CONSULT WITH THE HIGHWAY DEPARTMENT BEFORE DESIGNING, INSTALLING, OR MODIFYING ANY NEW OR EXISTING CURBS, WALKS, OR ROADWAYS IN THE STREETS SHOWN HEREON
2. SUBSURFACE INFORMATION SHOWN HEREON WAS OBTAINED FROM VARIOUS CITY DEPARTMENTS AND/OR PRIVATE UTILITY COMPANIES WHERE ACCESSABLE. THIS SURVEYOR ACCEPTS NO RESPONSIBILITY FOR ANY OF THIS DATA. ADDITIONAL UNDERGROUND UTILITIES MAY EXIST WHICH IS NOT SHOWN HEREON
3. NEW YORK STATE LAW REQUIRES BEFORE EXCAVATE CALL 811, AND DIGNET AT 1-800-272-4480
4. ELEVATIONS REFER TO THE DATUM OF THE BOROUGH OF BROOKLYN HIGHWAY DATUM WHICH IS 2.56 FEET ABOVE THE U.S. COAST AND GEODETIC SURVEY MEAN SEA LEVEL
5. THIS IS TO CERTIFY THAT THERE ARE NO VISIBLE STREAMS OR NATURAL WATER COURSES IN THE PROPERTY AS SHOWN ON THIS SURVEY.
6. NONVISIBLE EASEMENTS, RECORDED OR UNRECORDED, NOT SHOWN HEREON.
7. SECTIONS WERE TAKEN AT 25' INTERVALS, UNLESS OTHERWISE NOTED
8. THIS PROPERTY IS ON FLOOD INSURANCE RATE MAP PANEL 212 OF 457 IN COMMUNITY PANEL No. 360497 0212F; NON-PRINTED PANEL

LEGEND

[66.0]	LEGAL GRADE	(U)	UTILITY POLE
F.F.	FIRST FLOOR ELEVATION	(W)	WATER VALVE
TC	TOP OF CURB	(G)	GAS VALVE
BC	BOTTOM OF CURB		STREET SIGN
CL	CENTERLINE	EB	ELECTRIC BOX
EL	SPOT ELEVATION		HYDRANT
CONC	CONCRETE		TREE & SIZE
INV	INVERT ELEVATION		PROPERTY LINE
PI	POINT OF INTERSECTION	MP	METAL PLATE
CD	CELLAR DOOR	TW	TOP OF WALL
OHUL	OVERHEAD UTILITY LINES	BW	BOTTOM OF WALL
(E)	ELECTRIC MANHOLE		
(W)	WATER MANHOLE		
(S)	SEWER MANHOLE		

PROPERTY SITUATED AT:
TAX BLOCK 1992
TAX LOTS 5, 6, 7, 8, 9
1041/1041A/1043/1045/1047
FULTON STREET
BOROUGH OF BROOKLYN

CITY & STATE OF NEW YORK

1 V-001.00 ARCHITECTURAL SURVEY
N.T.S.

KEY PLAN

BLOCK: 1992 LOTS: 5,6,7,8,9

issue	rev	date	description
1		06/28/13	ISSUED TO DOB

ISSUES/REVISIONS

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WEB SITE: WWW.KFARCHITECT.COM
E-MAIL:KARL@KFARCHITECT.COM

SEAL

project title
RESIDENTIAL DEVELOPMENT
1045 FULTON STREET, BROOKLYN, NY 11238

drawing title
ARCHITECTURAL SURVEY

dob no
000000000

scale: N.T.S.	project no.: 13-06
date: 03/2013	sheet no.: ---- OF
drawn:	drawing no.: V-001.00
checked: KF	

APPENDIX 2

CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Bleeker Street Gardens 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, Bleeker Street Gardens 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, Shaminder Chawla, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 442-3007.

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. Bleeker Street Gardens 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-Bedford Branch
496 Franklin Avenue
Brooklyn, NY 11238
(718) 623-0012

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

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

Identify Issues of Public Concern.

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 Bleeker Street Gardens LLC, reviewed and approved by OER prior to distribution and mailed by Bleeker Street Gardens 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 3

SUSTAINABILITY STATEMENT

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

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

An estimate of the quantity (in tons) of clean, non-virgin materials (reported by type of material) reused under this plan will be quantified and reported in the RAR.

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

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

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

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

Low-Energy Project Management Program. Bleeker Street Gardens 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.

If included as part of the redevelopment, 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 4

SOIL/MATERIALS MANAGEMENT PLAN

1.1 SOIL SCREENING METHODS

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

1.2 STOCKPILE METHODS

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

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

1.3 CHARACTERIZATION OF EXCAVATED MATERIALS

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

1.4 MATERIALS EXCAVATION, LOAD-OUT AND DEPARTURE

The PE/QEP overseeing the remedial action will:

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

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

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

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 described in Section 5.8 of this RAWP. This routing

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

1.6 MATERIALS DISPOSAL OFF-SITE

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

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

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

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

regulations.

1.7 MATERIALS REUSE ON-SITE

On-site soil/fill is not expected to be reused or relocated on Site. If required or if this intention changes during development, soil and fill derived from the property that meets the soil cleanup objectives established in this plan may be reused on-site.. 'Reuse on-Site' means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on comparable soil/fill material, and addressed pursuant to the NYC VCP agreement subject to Engineering and Institutional Controls. The PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this RAWP are followed.

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

1.8 DEMARCATION

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

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

1.9 IMPORT OF BACKFILL SOIL FROM OFF-SITE SOURCES

This Section presents the requirements for imported fill materials to be used below the cover layer and within the clean soil cover layer. All imported soils will meet OER-approved

backfill and cover soil quality objectives for this Site. The backfill and cover soil quality objectives are the lower of the protection of groundwater and the protection of public health soil cleanup objectives (SCOs) for restricted residential use as outlined in 6 NYCRR Part 375-6.7(d) and table 375-6.8(b).

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 NYSDEC.

1.11 STORM-WATER POLLUTION PREVENTION

Applicable laws and regulations pertaining to storm-water pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in this RAWP (silt fences and barriers, and hay bale checks) will be installed around the entire perimeter of the remedial construction area and inspected once a week and after every storm

event to ensure that they are operating appropriately. Discharge locations will be inspected to determine whether erosion control measures are effective in preventing significant impacts to receptors. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. All necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. Undercutting or erosion of the silt fence toe anchor will be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

1.12 CONTINGENCY PLAN

This contingency plan is developed for the remedial construction to address the discovery of unknown structures or contaminated media during excavation. Identification of unknown contamination source areas during invasive Site work will be promptly communicated to OER's Project Manager. Petroleum spills will be reported to the NYS DEC Spill Hotline. These findings will be included in the daily report. If previously unidentified contaminant sources are found during on-Site remedial excavation or development-related excavation, sampling will be performed on contaminated source material and surrounding soils and reported to OER. Chemical analytical testing will be performed for TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

1.13 ODOR, DUST AND NUISANCE CONTROL

Odor Control

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

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

Dust Control

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

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

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

Other Nuisances

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

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

APPENDIX 5

HEALTH AND SAFETY PLAN

1041-1047 Fulton Street

BROOKLYN, NEW YORK

Construction Health and Safety Plan

NYC VCP Number: 14CVCP168K

OER Project Number: 13EHN319K

Prepared for:

Bleeker Street Gardens LLC

708 Sharrotts Road

Staten Island, NY 10309

(718) 967-3720

Prepared by:

AKRF, Inc.
440 Park Avenue South, 7th Floor
New York, NY 10016
212-696-0670

SEPTEMBER 2013

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1.0 PURPOSE

The purpose of this Construction Phase Environmental Health and Safety Plan ("CHASP") is to assign responsibilities, establish personnel protection standards and mandatory safety practices and procedures, and provide for contingencies that may arise during construction at the project site. The CHASP is intended to minimize health and safety risks resulting from the known and potential presence of hazardous materials on the site.

This plan is not designed to address potential geotechnical, mechanical, or structural safety concerns, nor to supersede or replace any OSHA regulation and/or local and state construction codes or regulations.

2.0 APPLICABILITY

Work subject to this CHASP includes activities that disturb the existing soil on-site. The contractors and their subcontractors involved in the construction project will provide a copy of this CHASP to their employees whose work involves any potential exposure to the on-site chemical hazards, and will complete all work in accordance with this CHASP.

3.0 SITE DESCRIPTION

3.1 General Information

The "Site" is located at 1041-1047 Fulton Street in the Clinton Hill section of Brooklyn, New York and is identified as Block 1992, Lots 5, 6, 7, 8, and 9 on the New York City Tax Map. Figure 1 shows the Site location. The Site is approximately 6,300-square feet and is bounded by residential properties to the north, Fulton Street to the south, and residential and commercial buildings to the east and west. Currently, the western building on the Site is used as a funeral home and the two eastern buildings are vacant (portions of the eastern buildings were reportedly formerly used as a funeral home). The Site contains three abutting buildings and landscaping is present along the northern side of the site. The portion of the site occupying 1041-1043 Fulton Street consists of two stories with no basement, the portion of the Site occupying 1045 Fulton Street consists of three stories with a basement, and the portion of the Site occupying 1047 Fulton Street consists of three stories with a basement. The northern portion of the buildings on Lots 6 and 7 are partially demolished to grade and a portion of the demolition extends into the two basements of these lots.

The contemplated development includes full demolition of the existing buildings and construction of a new eight-story residential building with one basement level. It is anticipated that the basement level would be used for maintenance rooms, storage space, and laundry and the first through eighth floors would be used for residential purposes. The developer is considering full build-out of the property, but the current plans allow for open space (either paved or landscaped) on the northern portion of the Site. The five site lots would likely be merged as part of redevelopment. The current zoning designation is commercial/residential mixed use. The proposed use is consistent with existing zoning for the property.

3.2 Hazard Potential

A Remedial Investigation (RI) was performed by AKRF, Inc. (AKRF) and Phase II Subsurface Investigations were previously performed by others at the Site to compile and evaluate data and

information necessary to develop this CHASP. Significant findings of the RI which are pertinent to the development activities proposed for the Site include the following:

The results of the soil sampling completed during the RI showed no volatile organic compounds (VOCs) detected at concentrations exceeding NYSDEC Unrestricted Use Soil Cleanup Objectives (UUSCOs or Track 1 SCOs) or Restricted Residential Soil Cleanup Objectives (RRSCOs or Track 2 SCOs). Tetrachloroethene (PCE) was detected in two soil samples, and gasoline-related compounds (ethylbenzene, toluene and xylenes) were detected in one sample; all of which were at trace, low-level concentrations. Up to 20 polycyclic aromatic hydrocarbons (PAHs) were detected in eight soil samples with a maximum concentration of 8.2 parts per million (ppm) in a shallow soil sample collected within the first two feet in the rear yard of the Site. A total of five PAHs were detected in two samples at concentrations exceeding the NYSDEC RRSCOs. Metals detections exceeding the applicable NYSDEC RRSCOs consisted of lead in two samples [SB-1 (0-2') and SB-1 (15-17')] at concentrations of 1,800 ppm and 638 ppm and mercury in one sample [SB-1 (0-2')] at a concentration of 1.3 ppm. Polychlorinated biphenyls (PCBs) were not detected in any of the soil samples and none of the low-level detections of pesticides exceeded applicable NYSDEC RRSCOs. Overall, no evidence of a contamination source area was noted during the soil sampling activities. Relatively low level SVOC exceedances of Track 2 Restricted Residential SCOs are attributed to the presence of historic fill beneath the building. There was no evidence of a release or spill (e.g., odors, staining, or significant PID readings) during any of the soil sampling activities.

Groundwater sampling was not performed as part of the RI due to drilling limitations with existing buildings, the presence of a subway structure south of the site, and depth to water requiring more intensive drilling techniques. After building demolition, groundwater sampling will be performed in accordance with the approved Phase II Environmental Site Investigation Work Plan. A historic off-site Phase II site investigation report containing sampling results from two off-site groundwater monitoring wells sampled in 2008 were reviewed. Results of the sampling showed a chloroform detection well below the NYSDEC Class GA Ambient Water Quality Standards (AWQS) in monitoring well, GW-2, the off-site well abutting the northern boundary of the Site. Chloroform and chlorodifluoromethane were detected in the remaining groundwater sample, GW-1, with a chloroform detection of 16.3 parts per billion (ppb), above the Class GA AWQS of 7 ppb. Five metals were detected above applicable AWQS in dissolved groundwater samples including iron, manganese, silver, and sodium. No SVOCs, pesticides, or PCBs were detected in the groundwater samples analyzed. The detected concentrations in groundwater samples from the north-adjacent site were typical of groundwater quality in Brooklyn in an area with historic fill and not attributed to an on-site spill or release.

The results of the soil vapor and ambient air sampling conducted during the RI showed 23 VOCs detected in the four samples. VOCs associated with petroleum [benzene, toluene, ethylbenzene, xylenes (collectively referred to as BTEX), n-heptane, n-hexane, and 2,2,4-trimethylpentane] were detected at concentrations up to 690 micrograms per cubic meter ($\mu g/m^3$). Solvent-related VOCs (acetone, TCE, chloroform, cyclohexane, methyl ethyl ketone (MEK), and methylene chloride) were detected at concentrations up to 740 $\mu g/m^3$. TCE was detected in one of the soil vapor samples, at a concentration of 42 µg/m3, which exceeds the New York State Department of Health (NYSDOH) Air Guideline Value (AGV) of 5 $\mu g/m^3$. However, this concentration was below the NYSDOH 2006 Soil Vapor Intrusion sub-slab vapor concentration matrix guidance value of 250 $\mu g/m^3$ established to determine if mitigation is appropriate to minimize current or potential exposures associated with soil vapor intrusion. TCE was not detected in the soil samples at the Site or in groundwater samples from the north-adjacent site. These conditions

have been considered in relation to the development of this CHASP and worker safety during the redevelopment activities associated with the Site.

3.3 Hazard Evaluation

The most likely routes of exposure are breathing of volatile and semivolatile compounds or particulate-laden air released during soil disturbing activities, dermal contact, and accidental ingestion. Appendix A includes specific health effects from the known on-site chemicals. The remaining sections of this CHASP address procedures (including training, air monitoring, work practices and emergency response) to reduce the potential for unnecessary and unacceptable exposure to these contaminants.

The potential adverse health effects from these detected contaminants are diverse. Many of these compounds are known or suspected to result in chronic illness from long-term exposures. However, due to the limited nature of the proposed construction, only acute effects are a potential concern.

This CHASP addresses potential environmental hazards from the presence of hazardous materials. It is not intended to address the normal hazards of construction work, which are separately covered by OSHA regulations and/or local and state construction codes and regulations. Although some of the chemicals of concern listed in the sections below were not detected during the Phase II study conducted, they are included here as a precaution.

3.3.1 Hazards of Concern

Check all that apply		
(x) Organic Chemicals	(x) Inorganic Chemicals	( ) Radiological
( ) Biological	( ) Explosive/Flammable	( ) Oxygen Deficient Atm.
(x) Heat Stress	(x) Cold Stress	( ) Other
Comments: No personnel are permitted to enter permit confined spaces		

3.3.2 Physical Characteristics

Check all that apply		
(x) Liquid	(x) Solid	( ) Sludge
(x) Vapors	( ) Unknown	( ) Other
Comments:		

3.3.3 Hazardous Materials

Check all that apply					
Chemicals	**Solids**	**Sludges**	**Solvents**	**Oils**	**Other**
( ) Acids	(x) Ash	( ) Paints	(x) Halogens	( ) Transformer	( ) Lab
( ) Caustics	(x) Asbestos	( ) Metals	( ) Petroleum	( ) Other DF	( ) Pharm.
(x) Pesticides	( ) Tailings	( ) POTW	( ) Other	(x) Motor or Hydraulic Oil	( ) Hospital
(x) Petroleum	(x) Other: Fill Material	( ) Other – Tars & Other NAPL		(x) Gasoline	( ) Rad.
( ) Inks				(x) Fuel Oil	( ) MGP

(x) PCBs					( ) Mold
(x) Metals					( ) Cyanide
(x) Other: VOCs & SVOCs					

3.3.4 **Known and Suspect Chemicals of Concern**

Chemicals	**REL/PEL/STEL (ppm)**	**Health Hazards**
Arsenic	REL = 0.002 mg/m^3 PEL = 0.01 mg/m^3	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin; potential occupational carcinogen.
Benzene	REL = 0.1 ppm PEL = 1 ppm STEL = 5 ppm	Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude, dermatitis; bone marrow depression, potential occupational carcinogen.
+DDT/DDE (pesticides)	REL = 0.5 mg/m^3 PEL = 1 mg/m^3 [skin]	Irritation eyes, skin; paresthesia tongue, lips, face; tremor; anxiety, dizziness, confusion, malaise (vague feeling of discomfort), headache, lassitude (weakness, exhaustion); convulsions; paresis hands; vomiting; potential carcinogen.
Ethylbenzene	REL = 100 ppm PEL = 100 ppm	Irritation eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma.
Fuel Oil	REL = 350 mg/m^3 PEL = 400 ppm	Nausea, irritation – eyes, hypertension, headache, light-headedness, loss of appetite, poor coordination; long-term exposure – kidney damage, blood clotting problems; potential carcinogen.
Lead	REL = 0.05 mg/m^3 PEL = 0.05 mg/m^3	Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension.
Mercury	REL = 0.1 mg/m^3 PEL = 0.05 mg/m^3	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria.
PCBs	REL = 0.001 mg/m^3 PEL = 0.5 mg/m^3 [skin]	irritation eyes; chloracne; liver damage; reproductive effects; potential occupational carcinogen.
Polycyclic Aromatic Hydrocarbons (PAHs)	PEL = 5 mg/m^3	Harmful effects to skin, bodily fluids, and ability to fight disease, reproductive problems; potential carcinogen.
Tetrachloroethene	REL = Minimize workplace exposure concentrations OSHA PEL = 100 ppm	Irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]
Trichloroethene	REL = Minimize workplace exposure concentrations OSHA PEL = 100 ppm	Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]
Toluene	REL = 100 ppm PEL = 200 ppm STEL = 300 ppm	Irritation eyes, nose; lassitude, confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage.
Xylenes	REL = 100 ppm	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, poor coordination, staggering gait; corneal

Chemicals	REL/PEL/STEL (ppm)	Health Hazards
	PEL = 100 ppm	vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis.
Comments: REL = National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limit PEL = OSHA Permissible Exposure Limit STEL = OSHA Short Term Exposure Limit		

3.3.5 **West Nile Virus**

The only way to avoid infection of West Nile Virus and St. Louis encephalitis is to avoid mosquito bites. Information provided by the CDC Division of Vector-Borne Infectious Diseases on this issue is provided in Appendix B.

4.0 HEALTH AND SAFETY OFFICER

The contractor or engineer will designate one of its personnel as the Site Safety Officer ("SSO"). The SSO will be a competent person responsible for the implementation of this plan. The SSO will have completed a 40-hour training course (up-dated by an annual refresher) that meets OSHA requirements of 29 CFR Part 1910, Occupational Safety and Health Standards. The SSO has stop-work authorization, which he/she will execute on his/her determination of an imminent safety hazard, emergency situation, or other potentially dangerous situation. If the SSO must be absent from the site, he/she will designate a suitably qualified replacement that is familiar with the CHASP. If work is stopped for any reason, the NYC OER would be notified immediately.

5.0 TRAINING

All those who enter the work area while intrusive activities are being performed must recognize and understand the potential hazards to health and safety. All construction personnel upon entering the site must attend a brief training meeting, its purpose being to:

- Make workers aware of the potential hazards they may encounter;
- Instruct workers on how to identify potential hazards,
- Provide the knowledge and skills necessary for them to perform the work with minimal risk to health and safety;
- Make workers aware of the purpose and limitations of safety equipment; and
- Ensure that they can safely avoid or escape from emergencies.

Each member of the construction crew will be instructed in these objectives before he/she goes onto the site. Construction personnel will be responsible for identifying potential hazards in the work zone. The SSO or other suitably trained individual will be responsible for conducting the training program. Others who enter the site must be accompanied by a suitably-trained construction worker.

6.0 GENERAL WORK PRACTICES

To protect the health and safety of the field personnel, all field personnel will adhere to the guidelines listed below during activities involving subsurface disturbance in contaminated areas.

- Eating, drinking, chewing gum or tobacco, and smoking are prohibited, except in designated areas on the site. These areas will be designated by the SSO.
- Workers must wash their hands and face thoroughly on leaving the work area and before eating, drinking, or any other such activity. The workers should shower as soon as possible after leaving the site.
- Contact with contaminated or suspected surfaces should be avoided.
- The buddy system should always be used; each buddy should watch for signs of fatigue, exposure, and heat stress.

7.0 PERSONAL PROTECTIVE EQUIPMENT & AIR MONITORING

7.1 Personal Protective Equipment

The personal protection equipment required for various kinds of site investigation tasks are based on 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response, Appendix B, "General Description and Discussion of the Levels of Protection and Protective Gear."

AKRF field personnel and other site personnel will wear, at a minimum, Level D personal protective equipment. The protection will be based on the air monitoring described in Section 7.2.

Level of Protection Summary

LEVEL OF PROTECTION & PPE		**Excavation and Other Earth Moving Activities**
Level D (x) Steel Toe Shoes (x) Hard Hat (within 25 ft of excavator) (x) Work Gloves	(x) Safety Glasses ( ) Face Shield (x) Ear Plugs (within 25 ft of excavator or jackhammer) ( ) Latex Gloves	Yes
Level D – Modified ***(in addition to Level D)*** (x) Tyvek Coveralls	(x) Nitrile Gloves ( ) Overboots ( ) Saranex Coveralls	As necessary
Level C ***(in addition to Level D – Modified)*** (x) Half-Face Respirator ( ) Full Face Respirator ( ) Full-Face PAPR	( ) Particulate Cartridge ( ) Organic Cartridge (x) Dual Organic/Particulate Cartridge	If PID > 10 ppm or particulate > 5 mg/m^3 (in breathing zone)
Comments: Cartridges to be changed out at least once per shift unless warranted beforehand (e.g., more difficult to breath or any odors detected).		

7.2 Work Zone Air Monitoring

Real time air monitoring will be performed with a photoionization detector (PID) and with a particulate air monitor during sampling and excavation work required for Site development. Measurements would be taken prior to commencement of work and continuously during the work

as outlined in the following table. Measurements will be made as close to the workers as practicable and at the breathing height of the workers. The SSO will set up the equipment and confirm that it is working properly. His/her designee may oversee the air measurements during the day. The initial measurement for the day will be performed before the start of work and will establish the background level for that day. The final measurement for the day will be performed after the end of work. The action levels and required responses are listed in the following table.

Action Levels and Required Safety Response Actions

Instrument	Task to be Monitored	Action Level	Response Action
PID (OVM 580B or equivalent)	All Soil Movement Activities	Less than 10 ppm in breathing zone.	Level D or D-Modified
		Between 10 and520 ppm	Level C
		More than 50 ppm	Stop work. Resume work when readings are less than 50 ppm.
Particulate monitor (Dustrak, MIE 1000 Personal DataRam or equivalent)	All Soil Movement Activities	Less than 5 mg/m^3	Level D
		Between 5 mg/m^3 and 125 mg/m^3	Level C. Apply dust suppression measures. If < 2.5 mg/m^3, resume work using Level D. Otherwise, use Level C.
		Above 125 mg/m^3	Stop work. Apply additional dust suppression measures. Resume work when less than 125 mg/m^3.

Field personnel will be trained in the proper operation of all field instruments at the start of the field program. Instruction manuals for the equipment will be on file at the site for referencing proper operation, maintenance and calibration procedures.

The equipment will be calibrated according to manufacturer specifications at the start of each day of fieldwork. If an instrument fails calibration, the project manager will be contacted immediately to obtain a replacement instrument and arrange for repairs. A calibration log will be maintained to record the date of each calibration, any failure to calibrate and corrective actions taken. The PID will be calibrated each day using 100 parts per million (ppm) isobutylene standard gas.

8.0 DECONTAMINATION PROCEDURES

8.1 Personnel Decontamination

Personnel decontamination (decon), if deemed necessary by the SSO, will take place in a designated decontamination area. This area will be delineated during each stage of work. Personnel decontamination will consist of the following steps:

- Soap and potable water wash and potable water rinse of gloves;
- Coverall removal (if applicable);

- Glove removal;
- Disposable clothing removal; and
- Field wash of hands and face.

8.2 Sampling Equipment Decontamination

Any non-disposable sampling equipment for confirmatory sampling or other equipment that is in contact with contaminated materials will be decontaminated in accordance with the following procedure:

- Double wash with solution of Simple Green® and clean tap water;
- Double rinse with clean tap water;
- Rinse with clean distilled water; and
- Allow equipment to air dry.

8.3 Heavy Equipment Decontamination

If heavy equipment comes in contact with contaminated materials, it will be decontaminated prior to being relocated to a clean area or leaving the site. A designated decontamination pad will be constructed, where soil, dust, or oil will be washed off the exterior, undercarriage, and wheels or tracks of the equipment. Wash water will be collected for treatment and/or disposal.

9.0 EMERGENCY RESPONSE

9.1 Emergency Procedures

In the event that an emergency develops on site, the procedures delineated herein are to be immediately followed. Emergency conditions are considered to exist if:

- Any member of the field crew is involved in an accident or experiences any adverse effects or symptoms of exposure while on site; and
- A condition is discovered that suggests the existence of a situation more hazardous than anticipated.
- A spill of oil or other hazardous materials.

General emergency procedures, and specific procedures for personal injury, chemical exposure and radiation exposure, are described below. In the event of an accident or emergency, an Incident Report form should be filled out and placed in the project file. An example Weekly Safety Report Form and Incident Report Form are provided in Appendix C. Information on emergency hand signals is provided in Appendix D.

9.1.1 Chemical Exposure

If a member of the field crew demonstrates symptoms of chemical exposure the procedures outlined below should be followed:

- Another team member (buddy) should remove the individual from the immediate area of contamination. The buddy should communicate to the SSO (via voice and hand signals) of the chemical exposure. The SSO should contact the appropriate emergency response agency.

- Precautions should be taken to avoid exposure of other individuals to the chemical.
- If the chemical is on the individual's clothing, the chemical should be neutralized or removed if it is safe to do so.
- If the chemical has contacted the skin, the skin should be washed with copious amounts of water.
- In case of eye contact, an emergency eye wash should be used. Eyes should be washed for at least 15 minutes.
- All chemical exposure incidents must be reported in writing to the SSO. The SSO is responsible for completing the Incident Report Form.

9.1.2 Personal Injury

In case of personal injury at the site, the following procedures should be followed:

- Another team member (buddy) should signal the SSO that an injury has occurred.
- A field team member trained in first aid can administer treatment to an injured worker.
- If deemed necessary, the victim should then be transported to the nearest hospital or medical center. If necessary, an ambulance should be called to transport the victim.
- The SSO is responsible for making certain that an Incident Report Form is completed. This form is to be submitted to the SSO. Follow-up action should be taken to correct the situation that caused the accident.
- Any incident (near miss, property damage, first aid, medical treatment, etc.) must be reported.

A first-aid kit, eye-wash, and blood-born pathogens kit will be kept on-site during the field activities.

9.1.3 Evacuation Procedures

- The SSO will initiate evacuation procedures by signaling to leave the site or containment structure;
- All personnel in the work area should evacuate the area and meet in the common designated area;
- All personnel suspected to be in or near the contract work area should be accounted for and the whereabouts or missing persons determined immediately; and
- The SSO will then give further instruction.

9.1.4 Procedures Implemented in the Event of a Major Fire, Explosion, or Emergency

- Notify the paramedics and/or fire department, as necessary;
- Signal the evacuation procedure previously outlined and implement the entire procedure;
- Isolate the area;
- Stay upwind of any fire;
- Keep the area surrounding the problem source clear after the incident occurs;

- Complete accident report for and distribute to appropriate personnel.

9.1.5 Spill Response

All personnel must take every precaution to minimize the potential for spills during site operations. Any spill will be reported immediately to the SSO. The SSO will immediately report any spills to the NYSDEC Spill Hotline. The OER will be provided with the spill numbers assigned by the NYSDEC.

Spill control apparatus (sorbent materials) will be located on-site. All materials used for the clean up of spills will be containerized and labeled separately from other wastes. The SSO, in consultation with AKRF's Project Manager, will determine if additional spill response measures are required.

9.2 Hospital Directions

The location of the nearest hospital, as shown on Figure 1 Hospital Location Map, is **Brooklyn Hospital Center**. The address of the hospital is 121 Dekalb Ave, New York, NY 11205. Directions to the hospital are provided below.

Hospital Information and Directions

Hospital Name:	Brooklyn Hospital Center
Phone Number:	(718) 250-8000
Address/Location:	121 Dekalb Avenue – Brooklyn, New York
Directions to ER:	Head west (right) on Fulton St toward Downing St RIGHT onto Ashland Pl The emergency room entrance is on the LEFT

9.3 CHASP Contact Information

AKRF Project Director – Marc Godick ..... (914) 922-2356 (office)
AKRF Project Manager – Kate Brunner..... (646) 388-9525 (office)
OER Project Manager –Shaminder Chawla……(212) 341-2034 (office)
Site Safety Officer (SSO) – Ashutosh Sharma ..... (917) 842-6781 (cell)
Brooklyn Hospital Center ..... (718) 250-8000
Ambulance, Fire and Police Departments..... 911
Local Poison Control ..... (212) 764-7667
pm/weekend (212) 340-4494
NYSDEC Spill Response Team..... (800) 457-7362

APPROVAL & ACKNOWLEDGMENTS OF CHASP

APPROVAL

Signed: _____ Date: _____

Project Manager

Signed: _____ Date: _____

Health and Safety Officer

Below is an affidavit that must be signed by all workers who enter the site. A copy of the CHASP must be on-site at all times and will be kept by the SSO.

AFFIDAVIT

I,_____(name), of_____(company name), have read the Construction Health and Safety Plan (CHASP) for the 1041-1047 Fulton Street site in Brooklyn, New York. I agree to conduct all on-site work in accordance with the requirements set forth in this HASP and understand that failure to comply with this HASP could lead to my removal from the site.

Signed: _____ Company: _____ Date: _____
Signed: _____ Company: _____ Date: _____
Signed: _____ Company: _____ Date: _____
Signed: _____ Company: _____ Date: _____
Signed: _____ Company: _____ Date: _____
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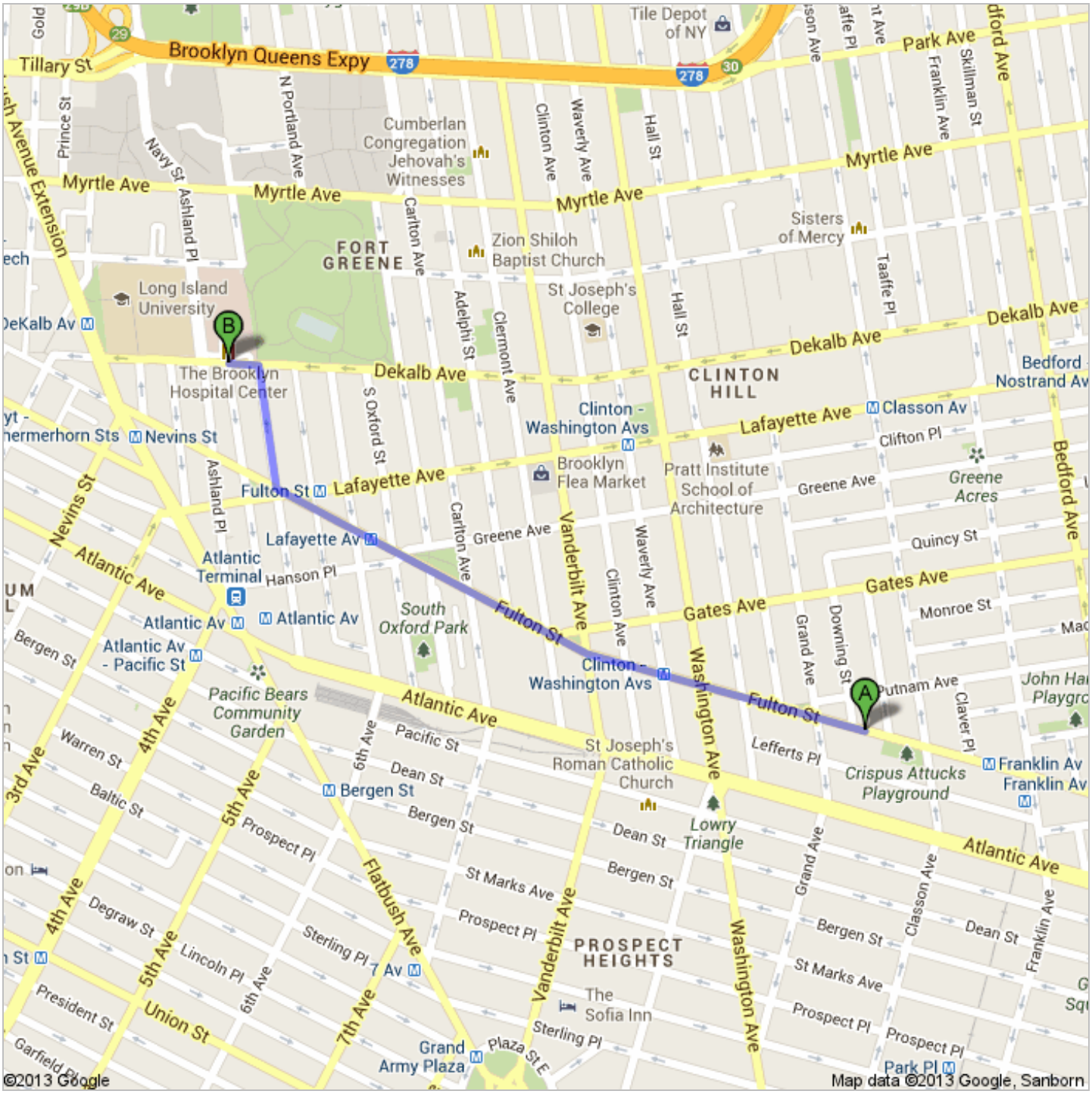
FIGURES

Google

Directions to The Brooklyn Hospital Center
121 Dekalb Ave, New York, NY 11205
1.2 mi – about **5 mins**



1041 Fulton St, Brooklyn, NY 11238

1.	Head **west** on **Fulton St** toward **Downing St** About 3 mins	go 0.9 mi total 0.9 mi
2.	Turn right onto **Fort Greene Pl**	go 0.2 mi total 1.1 mi
3.	Turn left onto **Dekalb Ave** Destination will be on the right	go 230 ft total 1.2 mi

The Brooklyn Hospital Center
121 Dekalb Ave, New York, NY 11205

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.

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

APPENDIX A

POTENTIAL HEALTH EFFECTS FROM ON-SITE CONTAMINANTS

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

ARSENIC
CAS # 7440-38-2

Division of Toxicology ToxFAQs™ December 2003

This fact sheet answers the most frequently asked health questions (FAQs) about arsenic. For more information, 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. It's 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 occurs 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 at 1,014 of the 1,598 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. Organic arsenic compounds are used as pesticides, primarily on cotton plants.

What happens to arsenic when it enters the environment?

❑ Arsenic cannot be destroyed in the environment. It can only change its form.
❑ Arsenic in air will settle to the ground or is washed out of the air by rain.
❑ Many arsenic compounds can dissolve in water.
❑ Fish and shellfish can accumulate arsenic, but the arsenic in fish is mostly in a form that is not harmful.

How might I be exposed to arsenic?

❑ Eating food, drinking water, or breathing air containing arsenic.
❑ Breathing contaminated workplace air.
❑ Breathing sawdust or burning smoke from wood treated with arsenic.
❑ Living near uncontrolled hazardous waste sites containing arsenic.
❑ Living in areas with unusually high natural levels of arsenic in rock.

How can arsenic affect my health?

Breathing high levels of inorganic arsenic can give you a sore throat or irritated lungs. Ingesting high levels of inorganic arsenic can result in death. Lower levels of arsenic can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of "pins and needles" in hands and feet.

Ingesting or breathing low levels of inorganic arsenic for a long time can cause a darkening of the 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.

Organic arsenic compounds are less toxic than inorganic arsenic compounds. Exposure to high levels of some organic arsenic compounds may cause similar effects as inorganic arsenic.

How likely is arsenic to cause cancer?

Several studies have shown that inorganic arsenic can increase the risk of lung cancer, skin cancer, bladder cancer, liver cancer, kidney cancer, and prostate cancer. The World Health Organization (WHO), the Department of Health and Human Services (DHHS), and the EPA have determined that inorganic arsenic is a human carcinogen.

How can arsenic affect children?

We do not know if exposure to arsenic will result in birth defects or other developmental effects in people. Birth defects have been observed in animals exposed to inorganic arsenic.

It is likely that health effects seen in children exposed to high amounts of arsenic will be similar to the effects seen in adults.

How can families reduce the risk of exposure to arsenic?

❑ If you use arsenic-treated wood in home projects, you should wear dust masks, gloves, and protective 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 sources of water and limit contact with soil.

Is there a medical test to show whether I've been exposed to arsenic?

There are tests to measure the level of arsenic in blood, urine, hair, or fingernails. The urine 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 or arsenic over the past 6-12 months. These tests can determine if you have been exposed to above-average levels of arsenic. They cannot predict how the arsenic levels in your body will affect your health.

Has the federal government made recommendations to protect human health?

EPA has set limits on the amount of arsenic that industrial sources can release to the environment and has restricted or canceled many 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 has set limits of 10 μg arsenic per cubic meter of workplace air (10 $\mu g/m^3$) for 8 hour shifts and 40 hour work weeks.

Source of Information

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological Profile for Arsenic. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html . 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.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

BENZENE
CAS # 71-43-2

This fact sheet answers the most frequently asked health questions (FAQs) about benzene. For more information, 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: Benzene is a widely used chemical formed from both natural processes and human activities. Breathing benzene can cause drowsiness, dizziness, and unconsciousness; long-term benzene exposure causes effects on the bone marrow and can cause anemia and leukemia. Benzene has been found in at least 813 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is benzene?

(Pronounced bĕn′zēn′)

Benzene is a colorless liquid with a sweet odor. It evaporates into the air very quickly and dissolves slightly in water. It is highly flammable and is formed from both natural processes and human activities.

Benzene is widely used in the United States; it ranks in the top 20 chemicals for production volume. Some industries use benzene to make other chemicals which are used to make plastics, resins, and nylon and synthetic fibers. Benzene is also used to make some types of rubbers, lubricants, dyes, detergents, drugs, and pesticides. Natural sources of benzene include volcanoes and forest fires. Benzene is also a natural part of crude oil, gasoline, and cigarette smoke.

What happens to benzene when it enters the environment?

- Industrial processes are the main source of benzene in the environment.
- Benzene can pass into the air from water and soil.
- It reacts with other chemicals in the air and breaks down within a few days.
- Benzene in the air can attach to rain or snow and be carried back down to the ground.
- It breaks down more slowly in water and soil, and can pass through the soil into underground water.
- Benzene does not build up in plants or animals.

How might I be exposed to benzene?

- Outdoor air contains low levels of benzene from tobacco smoke, automobile service stations, exhaust from motor vehicles, and industrial emissions.
- Indoor air generally contains higher levels of benzene from products that contain it such as glues, paints, furniture wax, and detergents.
- Air around hazardous waste sites or gas stations will contain higher levels of benzene.
- Leakage from underground storage tanks or from hazardous waste sites containing benzene can result in benzene contamination of well water.
- People working in industries that make or use benzene may be exposed to the highest levels of it.
- A major source of benzene exposures is tobacco smoke.

How can benzene affect my health?

Breathing very high levels of benzene can result in death, while high levels can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. Eating or drinking foods containing high levels of benzene can cause vomiting, irritation of the stomach, dizziness, sleepiness, convulsions, rapid heart rate, and death.

ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html

The major effect of benzene from long-term (365 days or longer) exposure is on the blood. Benzene causes harmful effects on the bone marrow and can cause a decrease in red blood cells leading to anemia. It can also cause excessive bleeding and can affect the immune system, increasing the chance for infection.

Some women who breathed high levels of benzene for many months had irregular menstrual periods and a decrease in the size of their ovaries. It is not known whether benzene exposure affects the developing fetus in pregnant women or fertility in men.

Animal studies have shown low birth weights, delayed bone formation, and bone marrow damage when pregnant animals breathed benzene.

How likely is benzene to cause cancer?

The Department of Health and Human Services (DHHS) has determined that benzene is a known human carcinogen. Long-term exposure to high levels of benzene in the air can cause leukemia, cancer of the blood-forming organs.

Is there a medical test to show whether I've been exposed to benzene?

Several tests can show if you have been exposed to benzene. There is test for measuring benzene in the breath; this test must be done shortly after exposure. Benzene can also be measured in the blood, however, since benzene disappears rapidly from the blood, measurements are accurate only for recent exposures.

In the body, benzene is converted to products called metabolites. Certain metabolites can be measured in the urine. However, this test must be done shortly after exposure and is not a reliable indicator of how much benzene you have been exposed to, since the metabolites may be present in urine from other sources.

Has the federal government made recommendations to protect human health?

The EPA has set the maximum permissible level of benzene in drinking water at 0.005 milligrams per liter (0.005 mgL). The EPA requires that spills or accidental releases into the environment of 10 pounds or more of benzene be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit of 1 part of benzene per million parts of air (1 ppm) in the workplace during an 8-hour workday, 40-hour workweek.

Glossary

Anemia: A decreased ability of the blood to transport oxygen.

Carcinogen: A substance with the ability to cause cancer.

CAS: Chemical Abstracts Service.

Chromosomes: Parts of the cells responsible for the development of hereditary characteristics.

Metabolites: Breakdown products of chemicals.

Milligram (mg): One thousandth of a gram.

Pesticide: A substance that kills pests.

References

This ToxFAQs information is taken from the 1997 Toxicological Profile for Benzene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html 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.

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COPPER

CAS # 7440-50-8

Division of Toxicology ToxFAQs™ September 2002

This fact sheet answers the most frequently asked health questions (FAQs) about copper. For more information, 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. 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: Copper is a reddish metal that occurs naturally in the environment. It also occurs naturally in plants and animals. Low levels of copper are essential for maintaining good health. High levels can cause harmful effects such as irritation of the nose, mouth and eyes, vomiting, diarrhea, stomach crumps, and nausea. Copper has been found in at least 884 of the 1,613 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is copper?

Copper is a reddish metal that occurs naturally in rocks, soil, water, and air. Copper also occurs naturally in plants and animals.

Metallic copper can be easily molded or shaped. Metallic copper can be found in the U.S. penny, electrical wiring, and some water pipes. Metallic copper is also found in mixtures (called alloys) with other metals such as brass and bronze. Copper is also found as part of other compounds forming salts. Copper salts occur naturally, but are also manufactured. The most common copper salt is copper sulfate. Most copper compounds are blue-green in color. Copper compounds are commonly used in agriculture to treat plant diseases like mildew, for water treatment and, as preservatives for wood, leather, and fabrics.

What happens to copper when it enters the environment?

❑ Copper can enter the environment from the mining of copper and other metals and from factories that make or use metallic copper or copper compounds.

❑ It can also enter the environment through domestic waste water, combustion of fossil fuels and wastes, wood production, phosphate fertilizer production, and natural sources (e.g., windblown dust from soils, volcanoes, decaying vegetation, forest fires, and sea spray).

❑ Copper in soil strongly attaches to organic material and minerals.

❑ Copper that dissolves in water becomes rapidly bound to particles suspended in the water.

❑ Copper does not typically enter groundwater.

❑ Copper carried by particles emitted from smelters and ore processing plants is carried back to the ground by gravity or in rain or snow.

❑ Copper does not break down in the environment.

How might I be exposed to copper?

❑ Breathing air, drinking water, eating food, and by skin contact with soil, water, or other copper-containing substances.

❑ Some copper in the environment can be taken up by plants and animals.

❑ Higher exposure may occur if your water is corrosive and you have copper plumbing and brass water fixtures. ❑ You may be exposed to higher amounts of copper if you drink water or swim in lakes or reservoirs recently treated with copper to control algae or receive cooling water from a power plant that may have high amounts of dissolved copper.

❑ Using some garden products (e.g., fungicides) to control plant diseases.

❑ Living near bronze and brass production facilities may expose you to higher copper levels in soil.

❑ You may breathe copper-containing dust or have skin contact if you work in the industry of mining copper or

processing the ore. You may breathe high levels if you grind or weld copper metal.

How can copper affect my health?

Copper is essential for good health, but high amounts can be harmful. Long-term exposure to copper dust can irritate your nose, mouth, and eyes, and cause headaches, dizziness, nausea, and diarrhea.

Drinking water with higher than normal levels of copper may cause vomiting, diarrhea, stomach cramps, and nausea. Intentionally high intakes of copper can cause liver and kidney damage and even death.

How likely is copper to cause cancer?

We do not know whether copper can cause cancer in humans. The EPA has determined that copper is not classifiable as to carcinogenicity.

How can copper affect children?

Exposure to high levels of copper will result in the same type of effects in children and adults. Studies in animals suggest that the young children may have more severe effects than adults; we do not know if this would also be true in humans. There is a very small percentage of infants and children who are unusually sensitive to copper.

We do not know if copper can cause birth defects or other developmental effects in humans. Studies in animals suggest that ingestion of high levels of copper may cause a decrease in fetal growth.

How can families reduce the risk of exposure to copper?

❑ The greatest potential source of copper exposure is through drinking water, especially in water that is first drawn in the morning after sitting in copper pipes and brass faucets overnight.

❑ To reduce exposure, run the water for at least 15-30 seconds before using it.

❑ If you are exposed to copper at work, you may carry copper home on your skin, clothes, or tools. You can avoid this by showering, and changing clothing before leaving work, and your work clothes should be kept separate from other clothes and laundered separately.

Is there a medical test to show whether I've been exposed to copper?

Copper is normally found in all tissues of the body, blood, urine, feces, hair, and nails. High levels of copper in these samples can show that you have been exposed to higher than normal levels of copper. Tests to measure copper levels in the body are not routinely available at the doctor's office because they require special equipment. These tests cannot tell the extent of exposure or whether you will experience harmful effects.

Has the federal government made recommendations to protect human health?

The EPA has determined that drinking water should not contain more than 1.3 milligrams of copper per liter of water (1.3 mg/L).

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.1 mg per cubic meter (0.1 mg/m^3) of copper fumes (vapor generated from heating copper) and 1 mg/m^3 of copper dusts (fine metallic copper particles) and mists (aerosol of soluble copper) in workroom air during an 8-hour work shift, 40-hour workweek.

The Food and Nutrition Board of the Institute of Medicine recommends dietary allowances (RDAs) of 340 micrograms (340 µg) of copper per day for children aged 1-3 years, 440 µg/day for children aged 4-8 years, 700 µg/day for children aged 9-13 years, 890 µg/day for children aged 14-18 years, and 900 µg/day for adults.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2002. Toxicological Profile for Copper (Draft for Public Comment). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. 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.

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DDT, DDE, AND DDD

CAS # 50-29-3, 72-55-9, 72-54-8

Division of Toxicology ToxFAQs™ **September 2002**

This fact sheet answers the most frequently asked health questions (FAQs) about DDT, DDE, and DDD. For more information, 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. 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 DDT, DDE, and DDD occurs mostly from eating foods containing small amounts of these compounds, particularly meat, fish and poultry. High levels of DDT can affect the nervous system causing excitability, tremors and seizures. In women, DDE can cause a reduction in the duration of lactation and an increased chance of having a premature baby. DDT, DDE, and DDD have been found in at least 441 of the 1,613 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What are DDT, DDE, and DDD?

DDT (dichlorodiphenyltrichloroethane) is a pesticide once widely used to control insects in agriculture and insects that carry diseases such as malaria. DDT is a white, crystalline solid with no odor or taste. Its use in the U.S. was banned in 1972 because of damage to wildlife, but is still used in some countries.

DDE (dichlorodiphenyldichloroethylene) and DDD (dichlorodiphenyldichloroethane) are chemicals similar to DDT that contaminate commercial DDT preparations. DDE has no commercial use. DDD was also used to kill pests, but its use has also been banned. One form of DDD has been used medically to treat cancer of the adrenal gland.

What happens to DDT, DDE, and DDD when they enter the environment?

❑ DDT entered the environment when it was used as a pesticide; it still enters the environment due to current use in other countries.

❑ DDE enters the environment as contaminant or breakdown product of DDT; DDD also enters the environment as a breakdown product of DDT.

❑ DDT, DDE, and DDD in air are rapidly broken down by sunlight. Half of what's in air breaks down within 2 days.

❑ They stick strongly to soil; most DDT in soil is broken down slowly to DDE and DDD by microorganisms; half the DDT in soil will break down in 2-15 years, depending on the type of soil.

❑ Only a small amount will go through the soil into groundwater; they do not dissolve easily in water.

❑ DDT, and especially DDE, build up in plants and in fatty tissues of fish, birds, and other animals.

How might I be exposed to DDT, DDE, and DDD?

❑ Eating contaminated foods, such as root and leafy vegetables, fatty meat, fish, and poultry, but levels are very low.

❑ Eating contaminated imported foods from countries that still allow the use of DDT to control pests.

❑ Breathing contaminated air or drinking contaminated water near waste sites and landfills that may contain higher levels of these chemicals.

❑ Infants fed on breast milk from mothers who have been exposed.

❑ Breathing or swallowing soil particles near waste sites or landfills that contain these chemicals.

How can DDT, DDE, and DDD affect my health?

DDT affects the nervous system. People who accidentally swallowed large amounts of DDT became excitable and had tremors and seizures. These effects went away after the exposure stopped. No effects were seen in people who took small daily doses of DDT by capsule for 18 months.

A study in humans showed that women who had high amounts of a form of DDE in their breast milk were unable to

breast feed their babies for as long as women who had little DDE in the breast milk. Another study in humans showed that women who had high amounts of DDE in breast milk had an increased chance of having premature babies.
In animals, short-term exposure to large amounts of DDT in food affected the nervous system, while long-term exposure to smaller amounts affected the liver. Also in animals, short-term oral exposure to small amounts of DDT or its breakdown products may also have harmful effects on reproduction.

How likely are DDT, DDE, and DDD to cause cancer?

Studies in DDT-exposed workers did not show increases in cancer. Studies in animals given DDT with the food have shown that DDT can cause liver cancer.
The Department of Health and Human Services (DHHS) determined that DDT may reasonable be anticipated to be a human carcinogen. The International Agency for Research on Cancer (IARC) determined that DDT may possibly cause cancer in humans. The EPA determined that DDT, DDE, and DDD are probable human carcinogens.

How can DDT, DDE, and DDD affect children?

There are no studies on the health effects of children exposed to DDT, DDE, or DDD. We can assume that children exposed to large amounts of DDT will have health effects similar to the effects seen in adults. However, we do not know whether children differ from adults in their susceptibility to these substances.
There is no evidence that DDT, DDE, or DDD cause birth defects in people. A study showed that teenage boys whose mothers had higher DDE amounts in the blood when they were pregnant were taller than those whose mothers had lower DDE levels. However, a different study found the opposite in preteen girls. The reason for the discrepancy between these studies is unknown.
Studies in rats have shown that DDT and DDE can mimic the action of natural hormones and in this way affect the development of the reproductive and nervous systems. Puberty was delayed in male rats given high amounts of DDE as juveniles. This could possibly happen in humans. A study in mice showed that exposure to DDT during the first weeks of life may cause neurobehavioral problems later in life.

How can families reduce the risk of exposure to DDT,DDE, and DDE?

❑ Most families will be exposed to DDT by eating food or drinking liquids contaminated with small amounts of DDT.
❑ Cooking will reduce the amount of DDT in fish.
❑ Washing fruit and vegetables will remove most DDT from their surface.
❑ Follow health advisories that tell you about consumption of fish and wildlife caught in contaminated areas.

Is there a medical test to show whether I've been exposed to DDT, DDE, and DDD?

Laboratory tests can detect DDT, DDE, and DDD in fat, blood, urine, semen, and breast milk. These tests may show low, moderate, or excessive exposure to these compounds, but cannot tell the exact amount you were exposed to, or whether you will experience adverse effects. These tests are not routinely available at the doctor's office because they require special equipment.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) sets a limit of 1 milligram of DDT per cubic meter of air (1 mg/m^3) in the workplace for an 8-hour shift, 40-hour workweek.
The Food and Drug Administration (FDA) has set limits for DDT, DDE, and DDD in foodstuff at or above which the agency will take legal action to remove the products from the market.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2002. Toxicological Profile for DDT/DDE/DDD (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. 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.

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ETHYLBENZENE
CAS # 100-41-4

Agency for Toxic Substances and Disease Registry ToxFAQs **June 1999**

This fact sheet answers the most frequently asked health questions (FAQs) about ethylbenzene. For more information, 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. It's 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: Ethylbenzene is a colorless liquid found in a number of products including gasoline and paints. Breathing very high levels can cause dizziness and throat and eye irritation. Ethylbenzene has been found in at least 731 of the 1,467 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is ethylbenzene?

(Pronounced ĕthʹ əl bĕnʹ zēnʹ)

Ethylbenzene is a colorless, flammable liquid that smells like gasoline. It is found in natural products such as coal tar and petroleum and is also found in manufactured products such as inks, insecticides, and paints.

Ethylbenzene is used primarily to make another chemical, styrene. Other uses include as a solvent, in fuels, and to make other chemicals.

What happens to ethylbenzene when it enters the environment?

- Ethylbenzene moves easily into the air from water and soil.
- It takes about 3 days for ethylbenzene to be broken down in air into other chemicals.
- Ethylbenzene may be released to water from industrial discharges or leaking underground storage tanks.
- In surface water, ethylbenzene breaks down by reacting with other chemicals found naturally in water.
- In soil, it is broken down by soil bacteria.

How might I be exposed to ethylbenzene?

- Breathing air containing ethylbenzene, particularly in areas near factories or highways.
- Drinking contaminated tap water.
- Working in an industry where ethylbenzene is used or made.
- Using products containing it, such as gasoline, carpet glues, varnishes, and paints.

How can ethylbenzene affect my health?

Limited information is available on the effects of ethylbenzene on people's health. The available information shows dizziness, throat and eye irritation, tightening of the chest, and a burning sensation in the eyes of people exposed to high levels of ethylbenzene in air.

Animals studies have shown effects on the nervous system, liver, kidneys, and eyes from breathing ethylbenzene in air.

How likely is ethylbenzene to cause cancer?

The EPA has determined that ethylbenzene is not classifiable as to human carcinogenicity.

ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html

No studies in people have shown that ethylbenzene exposure can result in cancer. Two available animal studies suggest that ethylbenzene may cause tumors.

How can ethylbenzene affect children?

Children may be exposed to ethylbenzene through inhalation of consumer products, including gasoline, paints, inks, pesticides, and carpet glue. We do not know whether children are more sensitive to the effects of ethylbenzene than adults.

It is not known whether ethylbenzene can affect the development of the human fetus. Animal studies have shown that when pregnant animals were exposed to ethylbenzene in air, their babies had an increased number of birth defects.

How can families reduce the risk of exposure to ethylbenzene?

Exposure to ethylbenzene vapors from household products and newly installed carpeting can be minimized by using adequate ventilation.

Household chemicals should be stored out of reach of children to prevent accidental poisoning. Always store household chemicals in their original containers; never store them in containers children would find attractive to eat or drink from, such as old soda bottles. Gasoline should be stored in a gasoline can with a locked cap.

Sometimes older children sniff household chemicals, including ethylbenzene, in an attempt to get high. Talk with your children about the dangers of sniffing chemicals.

Is there a medical test to show whether I've been exposed to ethylbenzene?

Ethylbenzene is found in the blood, urine, breath, and some body tissues of exposed people. The most common way to test for ethylbenzene is in the urine. This test measures substances formed by the breakdown of ethylbenzene. This test needs to be done within a few hours after exposure occurs, because the substances leave the body very quickly.

These tests can show you were exposed to ethylbenzene, but cannot predict the kind of health effects that might occur.

Has the federal government made recommendations to protect human health?

The EPA has set a maximum contaminant level of 0.7 milligrams of ethylbenzene per liter of drinking water (0.7 mg/L).

The EPA requires that spills or accidental releases into the environment of 1,000 pounds or more of ethylbenzene be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set an occupational exposure limit of 100 parts of ethylbenzene per million parts of air (100 ppm) for an 8-hour workday, 40-hour workweek.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for ethylbenzene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html 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.

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FUEL OILS

CAS # 8008-20-6, 70892-10-3, 68476-30-2, 68476-34-6, 68476-31-3

This fact sheet answers the most frequently asked health questions (FAQs) about fuel oils. For more information, 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. It's 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.

SUMMARY: Fuel oils are liquid mixtures produced from petroleum, and their use mostly involves burning them as fuels. Drinking or breathing fuel oils may cause nausea or nervous system effects. However, exposure under normal use conditions is not likely to be harmful. Fuel oils have been found in at least 26 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What are fuel oils?

(Pronounced fyo͞o′əl oilz)

Fuel oils are a variety of yellowish to light brown liquid mixtures that come from crude petroleum. Some chemicals found in fuel oils may evaporate easily, while others may more easily dissolve in water.

Fuel oils are produced by different petroleum refining processes, depending on their intended uses. Fuel oils may be used as fuel for engines, lamps, heaters, furnaces, and stoves, or as solvents.

Some commonly found fuel oils include kerosene, diesel fuel, jet fuel, range oil, and home heating oil. These fuel oils differ from one another by their hydrocarbon compositions, boiling point ranges, chemical additives, and uses.

What happens to fuel oils when they enter the environment?

- Some chemicals found in fuel oils may evaporate into the air from open containers or contaminated soil or water.
- Some chemicals found in fuel oils may dissolve in water after spills to surface waters or leaks from underground storage tanks.
- Some chemicals found in fuel oils may stick to particles in water, which will eventually cause them to settle to the bottom sediment.
- Some of the chemicals found in fuel oils may be broken down slowly in air, water, and soil by sunlight or small organisms.
- Some of the chemicals found in fuel oils may build up significantly in plants and animals.

How might I be exposed to fuel oils?

- Using a home kerosene heater or stove, or using fuel oils at work.
- Breathing air in home or building basements that has been contaminated with fuel oil vapors entering from the soil.
- Drinking or swimming in water that has been contaminated with fuel oils from a spill or a leaking underground storage tank.
- Touching soil contaminated with fuel oils.
- Using fuel oils to wash paint or grease from skin or equipment.

How can fuel oils affect my health?

Little information is available about the health effects that may be caused by fuel oils. People who use kerosene

stoves for cooking do not seem to have any health problems related to their exposure.

Breathing some fuel oils for short periods may cause nausea, eye irritation, increased blood pressure, headache, lightheadedness, loss of appetite, poor coordination, and difficulty concentrating. Breathing diesel fuel vapors for long periods may cause kidney damage and lower your blood's ability to clot.

Drinking small amounts of kerosene may cause vomiting, diarrhea, coughing, stomach swelling and cramps, drowsiness, restlessness, painful breathing, irritability, and unconsciousness. Drinking large amounts of kerosene may cause convulsions, coma, or death. Skin contact with kerosene for short periods may cause itchy, red, sore, or peeling skin.

How likely are fuel oils to cause cancer?

The International Agency for Research on Cancer (IARC) has determined that some fuel oils (heavy) may possibly cause cancer in humans, but for other fuel oils (light) there is not enough information to make a determination. IARC has also determined that occupational exposures to fuel oils during petroleum refining are probably carcinogenic in humans.

Some studies with mice have suggested that repeated contact with fuel oils may cause liver or skin cancer. However, other mouse studies have found this not to be the case. No studies are available in other animals or in people on the carcinogenic effects of fuel oils.

Is there a medical test to show whether I've been exposed to fuel oils?

There is no medical test that shows if you have been exposed to fuel oils. Tests are available to determine if some of the chemicals commonly found in fuel oils are in your blood. However, the presence of these chemicals in blood may not necessarily mean that you have been exposed to fuel oils.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) and the Air Force Office of Safety and Health (AFOSH) have set a permissible exposure level (PEL) of 400 parts of petroleum distillates per million parts of air (400 ppm) for an 8-hour workday, 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends that average workplace air levels not exceed 350 milligrams of petroleum distillates per cubic meter of air (350 mg/m^3) for a 40-hour workweek.

The Department of Transportation (DOT) lists fuel oils as hazardous materials and, therefore, regulates their transportation.

Glossary

Carcinogenic: Able to cause cancer.

CAS: Chemical Abstracts Service.

Evaporate: To change into a vapor or a gas.

Hydrocarbon: Any compound made up of hydrogen and carbon.

Milligram (mg): One thousandth of a gram.

ppm: Parts per million.

Sediment: Mud and debris that have settled to the bottom of a body of water.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for fuel oils. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone:1-888-422-8737, FAX: 404-498-0093. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html 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.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

LEAD

CAS # 7439-92-1

Division of Toxicology and Environmental Medicine ToxFAQs™ **August 2007**

This fact sheet answers the most frequently asked health questions (FAQs) about lead. 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 lead can happen from breathing workplace air or dust, eating contaminated foods, or drinking contaminated water. Children can be exposed from eating lead-based paint chips or playing in contaminated soil. Lead can damage the nervous system, kidneys, and reproductive system. Lead has been found in at least 1,272 of the 1,684 National Priority List sites identified by the Environmental Protection Agency (EPA).

What is lead?

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing.

Lead has many different uses. It is used in the production of batteries, ammunition, metal products (solder and pipes), and devices to shield X-rays. Because of health concerns, lead from paints and ceramic products, caulking, and pipe solder has been dramatically reduced in recent years. The use of lead as an additive to gasoline was banned in 1996 in the United States.

What happens to lead when it enters the environment?

- ❏ Lead itself does not break down, but lead compounds are changed by sunlight, air, and water.
- ❏ When lead is released to the air, it may travel long distances before settling to the ground.
- ❏ Once lead falls onto soil, it usually sticks to soil particles.
- ❏ Movement of lead from soil into groundwater will depend on the type of lead compound and the characteristics of the soil.

How might I be exposed to lead?

- ❏ Eating food or drinking water that contains lead. Water pipes in some older homes may contain lead solder. Lead can leach out into the water.
- ❏ Spending time in areas where lead-based paints have been used and are deteriorating. Deteriorating lead paint can contribute to lead dust.
- ❏ Working in a job where lead is used or engaging in certain hobbies in which lead is used, such as making stained glass.
- ❏ Using health-care products or folk remedies that contain lead.

How can lead affect my health?

The effects of lead are the same whether it enters the body through breathing or swallowing. Lead can affect almost every organ and system in your body. The main target for lead toxicity is the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance in some tests that measure functions of the nervous system. It may also cause weakness in fingers, wrists, or ankles. Lead exposure also causes small increases in blood pressure, particularly in middle-aged and older people and can cause anemia. Exposure to high lead levels can severely damage the brain and kidneys in adults or children and ultimately cause death. In pregnant women, high levels of exposure to lead may cause miscarriage. High-level exposure in men can damage the organs responsible for sperm production.

How likely is lead to cause cancer?

We have no conclusive proof that lead causes cancer in humans. Kidney tumors have developed in rats and mice that had been given large doses of some kind of lead compounds. The Department of Health and Human Services

(DHHS) has determined that lead and lead compounds are reasonably anticipated to be human carcinogens and the EPA has determined that lead is a probable human carcinogen. The International Agency for Research on Cancer (IARC) has determined that inorganic lead is probably carcinogenic to humans and that there is insufficient information to determine whether organic lead compounds will cause cancer in humans.

How can lead affect children?

Small children can be exposed by eating lead-based paint chips, chewing on objects painted with lead-based paint, or swallowing house dust or soil that contains lead.

Children are more vulnerable to lead poisoning than adults. A child who swallows large amounts of lead may develop blood anemia, severe stomachache, muscle weakness, and brain damage. If a child swallows smaller amounts of lead, much less severe effects on blood and brain function may occur. Even at much lower levels of exposure, lead can affect a child's mental and physical growth.

Exposure to lead is more dangerous for young and unborn children. Unborn children can be exposed to lead through their mothers. Harmful effects include premature births, smaller babies, decreased mental ability in the infant, learning difficulties, and reduced growth in young children. These effects are more common if the mother or baby was exposed to high levels of lead. Some of these effects may persist beyond childhood.

How can families reduce the risks of exposure to lead?

❑ Avoid exposure to sources of lead.

❑ Do not allow children to chew or mouth surfaces that may have been painted with lead-based paint.

❑ If you have a water lead problem, run or flush water that has been standing overnight before drinking or cooking with it.

❑ Some types of paints and pigments that are used as make-up or hair coloring contain lead. Keep these kinds of products away from children

❑ If your home contains lead-based paint or you live in an area contaminated with lead, wash children's hands and faces often to remove lead dusts and soil, and regularly clean the house of dust and tracked in soil.

Is there a medical test to determine whether I've been exposed to lead?

A blood test is available to measure the amount of lead in your blood and to estimate the amount of your recent exposure to lead. Blood tests are commonly used to screen children for lead poisoning. Lead in teeth or bones can be measured by X-ray techniques, but these methods are not widely available. 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). These tests usually require special analytical equipment that is not available in a doctor's office. However, your doctor can draw blood samples and send them to appropriate laboratories for analysis.

Has the federal government made recommendations to protect human health?

The Centers for Disease Control and Prevention (CDC) recommends that states test children at ages 1 and 2 years. Children should be tested at ages 3–6 years if they have never been tested for lead, if they receive services from public assistance programs for the poor such as Medicaid or the Supplemental Food Program for Women, Infants, and Children, if they live in a building or frequently visit a house built before 1950; if they visit a home (house or apartment) built before 1978 that has been recently remodeled; and/or if they have a brother, sister, or playmate who has had lead poisoning. CDC considers a blood lead level of 10 μg/dL to be a level of concern for children.

EPA limits lead in drinking water to 15 μg per liter.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2007. Toxicological Profile for lead (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Environmental Medicine, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-800-232-4636, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. 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.

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MERCURY
CAS # 7439-97-6

This fact sheet answers the most frequently asked health questions (FAQs) about mercury. For more information, 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. It's 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 mercury occurs from breathing contaminated air, ingesting contaminated water and food, and having dental and medical treatments. Mercury, at high levels, may damage the brain, kidneys, and developing fetus. This chemical has been found in at least 714 of 1,467 National Priorities List sites identified by the Environmental Protection Agency.

What is mercury?

(Pronounced mŭr′kyə-rē)

Mercury is a naturally occurring metal which has several forms. The metallic mercury is a shiny, silver-white, odorless liquid. If heated, it is a colorless, odorless gas.

Mercury combines with other elements, such as chlorine, sulfur, or oxygen, to form inorganic mercury compounds or "salts," which are usually white powders or crystals. Mercury also combines with carbon to make organic mercury compounds. The most common one, methylmercury, is produced mainly by microscopic organisms in the water and soil. More mercury in the environment can increase the amounts of methylmercury that these small organisms make.

Metallic mercury is used to produce chlorine gas and caustic soda, and is also used in thermometers, dental fillings, and batteries. Mercury salts are sometimes used in skin lightening creams and as antiseptic creams and ointments.

What happens to mercury when it enters the environment?

- Inorganic mercury (metallic mercury and inorganic mercury compounds) enters the air from mining ore deposits, burning coal and waste, and from manufacturing plants.
- It enters the water or soil from natural deposits, disposal of wastes, and volcanic activity.
- Methylmercury may be formed in water and soil by small organisms called bacteria.
- Methylmercury builds up in the tissues of fish. Larger and older fish tend to have the highest levels of mercury.

How might I be exposed to mercury?

- Eating fish or shellfish contaminated with methylmercury.
- Breathing vapors in air from spills, incinerators, and industries that burn mercury-containing fuels.
- Release of mercury from dental work and medical treatments.
- Breathing contaminated workplace air or skin contact during use in the workplace (dental, health services, chemical, and other industries that use mercury).
- Practicing rituals that include mercury.

How can mercury affect my health?

The nervous system is very sensitive to all forms of mercury. Methylmercury and metallic mercury vapors are more harmful than other forms, because more mercury in these forms reaches the brain. Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing fetus. Effects on brain functioning may result in irritability, shyness, tremors, changes in vision or hearing, and memory problems.

Short-term exposure to high levels of metallic mercury vapors may cause effects including lung damage, nausea,

vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes, and eye irritation.

How likely is mercury to cause cancer?

There are inadequate human cancer data available for all forms of mercury. Mercuric chloride has caused increases in several types of tumors in rats and mice, and methylmercury has caused kidney tumors in male mice. The EPA has determined that mercuric chloride and methylmercury are possible human carcinogens.

How can mercury affect children?

Very young children are more sensitive to mercury than adults. Mercury in the mother's body passes to the fetus and may accumulate there. It can also can pass to a nursing infant through breast milk. However, the benefits of breast feeding may be greater than the possible adverse effects of mercury in breast milk.

Mercury's harmful effects that may be passed from the mother to the fetus include brain damage, mental retardation, incoordination, blindness, seizures, and inability to speak. Children poisoned by mercury may develop problems of their nervous and digestive systems, and kidney damage.

How can families reduce the risk of exposure to mercury?

Carefully handle and dispose of products that contain mercury, such as thermometers or fluorescent light bulbs. Do not vacuum up spilled mercury, because it will vaporize and increase exposure. If a large amount of mercury has been spilled, contact your health department. Teach children not to play with shiny, silver liquids.

Properly dispose of older medicines that contain mercury. Keep all mercury-containing medicines away from children.

Pregnant women and children should keep away from rooms where liquid mercury has been used.

Learn about wildlife and fish advisories in your area from your public health or natural resources department.

Is there a medical test to show whether I've been exposed to mercury?

Tests are available to measure mercury levels in the body. Blood or urine samples are used to test for exposure to metallic mercury and to inorganic forms of mercury. Mercury in whole blood or in scalp hair is measured to determine exposure to methylmercury. Your doctor can take samples and send them to a testing laboratory.

Has the federal government made recommendations to protect human health?

The EPA has set a limit of 2 parts of mercury per billion parts of drinking water (2 ppb).

The Food and Drug Administration (FDA) has set a maximum permissible level of 1 part of methylmercury in a million parts of seafood (1 ppm).

The Occupational Safety and Health Administration (OSHA) has set limits of 0.1 milligram of organic mercury per cubic meter of workplace air (0.1 mg/m^3) and 0.05 mg/m^3 of metallic mercury vapor for 8-hour shifts and 40-hour work weeks.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for mercury. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html 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.

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METHYL *TERT*-BUTYL ETHER (MTBE) CAS # 1634-04-4

Agency for Toxic Substances and Disease Registry ToxFAQs **September 1997**

This fact sheet answers the most frequently asked health questions (FAQs) about methyl *tert*-butyl ether (MTBE). For more information, 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: Methyl *tert*-butyl ether (MTBE) is a flammable liquid which is used as an additive in unleaded gasoline. Drinking or breathing MTBE may cause nausea, nose and throat irritation, and nervous system effects. MTBE has been found in at least 11 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is methyl *tert*-butyl ether?

(Pronounced měthʹəl tŭrʹshē-ĕrʹē byo͞otʹl ēʹthər)

Methyl *tert*-butyl ether (MTBE) is a flammable liquid with a distinctive, disagreeable odor. It is made from blending chemicals such as isobutylene and methanol, and has been used since the 1980s as an additive for unleaded gasolines to achieve more efficient burning.

MTBE is also used to dissolve gallstones. Patients treated in this way have MTBE delivered directly to their gall bladders through special tubes that are surgically inserted.

What happens to MTBE when it enters the environment?

- MTBE quickly evaporates from open containers and surface water, so it is commonly found as a vapor in the air.
- Small amounts of MTBE may dissolve in water and get into underground water.
- It remains in underground water for a long time.
- MTBE may stick to particles in water, which will cause it to eventually settle to the bottom sediment.
- MTBE may be broken down quickly in the air by sunlight.
- MTBE does not build up significantly in plants and animals.

How might I be exposed to MTBE?

- Touching the skin or breathing contaminated air while pumping gasoline.
- Breathing exhaust fumes while driving a car.
- Breathing air near highways or in cities.
- Drinking, swimming, or showering in water that has been contaminated with MTBE.
- Receiving MTBE treatment for gallstones.

How can MTBE affect my health?

Breathing small amounts of MTBE for short periods may cause nose and throat irritation. Some people exposed to MTBE while pumping gasoline, driving their cars, or working

in gas stations have reported having headaches, nausea, dizziness, and mental confusion. However, the actual levels of exposure in these cases are unknown. In addition, these symptoms may have been caused by exposure to other chemicals.

There are no data on the effects in people of drinking MTBE. Studies with rats and mice suggest that drinking MTBE may cause gastrointestinal irritation, liver and kidney damage, and nervous system effects.

How likely is MTBE to cause cancer?

There is no evidence that MTBE causes cancer in humans. One study with rats found that breathing high levels of MTBE for long periods may cause kidney cancer. Another study with mice found that breathing high levels of MTBE for long periods may cause liver cancer.

The Department of Health and Human Services (DHHS), the International Agency for Research on Cancer (IARC), and the EPA have not classified MTBE as to its carcinogenicity.

Is there a medical test to show whether I've been exposed to MTBE?

MTBE and its breakdown product, butyl alcohol, can be detected in your breath, blood, or urine for up to 1 or 2 days after exposure. These tests aren't available at most doctors' offices, but can be done at special laboratories that have the right equipment. There is no other test specific to determining MTBE exposure.

Has the federal government made recommendations to protect human health?

The EPA has issued guidelines recommending that, to protect children, drinking water levels of MTBE not exceed 4 milligrams per liter of water (4 mg/L) for an exposure of 1-10 days, and 3 mg/L for longer-term exposures.

The American Conference of Governmental Industrial Hygienists (ACGIH) has recommended an exposure limit of 40 parts of MTBE per million parts of air (40 ppm) for an 8-hour workday, 40-hour workweek.

Glossary

Carcinogenicity: Ability to cause cancer.

CAS: Chemical Abstracts Service.

Evaporate: To change into a vapor or gas.

Milligram (mg): One thousandth of a gram.

ppm: Parts per million.

Sediment: Mud and debris that have settled to the bottom of a body of water.

References

This ToxFAQs information is taken from the 1996 Toxicological Profile for Methyl *tert*-Butyl Ether produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html 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.

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POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)

Agency for Toxic Substances and Disease Registry ToxFAQs **September 1996**

This fact sheet answers the most frequently asked health questions (FAQs) about polycyclic aromatic hydrocarbons (PAHs). For more information, 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.

SUMMARY: Exposure to polycyclic aromatic hydrocarbons usually occurs by breathing air contaminated by wild fires or coal tar, or by eating foods that have been grilled. PAHs have been found in at least 600 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What are polycyclic aromatic hydrocarbons?

(Pronounced pŏl′ĭ-sī′klĭk ăr′ə-măt′ĭk hī′drə-kar′bənz)

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

What happens to PAHs when they enter the environment?

- PAHs enter the air mostly as releases from volcanoes, forest fires, burning coal, and automobile exhaust.
- PAHs can occur in air attached to dust particles.
- Some PAH particles can readily evaporate into the air from soil or surface waters.
- PAHs can break down by reacting with sunlight and other chemicals in the air, over a period of days to weeks.
- PAHs enter water through discharges from industrial and wastewater treatment plants.
- Most PAHs do not dissolve easily in water. They stick to solid particles and settle to the bottoms of lakes or rivers.
- Microorganisms can break down PAHs in soil or water after a period of weeks to months.
- In soils, PAHs are most likely to stick tightly to particles; certain PAHs move through soil to contaminate underground water.
- PAH contents of plants and animals may be much higher than PAH contents of soil or water in which they live.

How might I be exposed to PAHs?

- Breathing air containing PAHs in the workplace of coking, coal-tar, and asphalt production plants; smokehouses; and municipal trash incineration facilities.
- Breathing air containing PAHs from cigarette smoke, wood smoke, vehicle exhausts, asphalt roads, or agricultural burn smoke.
- Coming in contact with air, water, or soil near hazardous waste sites.
- Eating grilled or charred meats; contaminated cereals, flour, bread, vegetables, fruits, meats; and processed or pickled foods.
- Drinking contaminated water or cow's milk.

- Nursing infants of mothers living near hazardous waste sites may be exposed to PAHs through their mother's milk.

How can PAHs affect my health?

Mice that were fed high levels of one PAH during pregnancy had difficulty reproducing and so did their offspring. These offspring also had higher rates of birth defects and lower body weights. It is not known whether these effects occur in people.

Animal studies have also shown that PAHs can cause harmful effects on the skin, body fluids, and ability to fight disease after both short- and long-term exposure. But these effects have not been seen in people.

How likely are PAHs to cause cancer?

The Department of Health and Human Services (DHHS) has determined that some PAHs may reasonably be expected to be carcinogens.

Some people who have breathed or touched mixtures of PAHs and other chemicals for long periods of time have developed cancer. Some PAHs have caused cancer in laboratory animals when they breathed air containing them (lung cancer), ingested them in food (stomach cancer), or had them applied to their skin (skin cancer).

Is there a medical test to show whether I've been exposed to PAHs?

In the body, PAHs are changed into chemicals that can attach to substances within the body. There are special tests that can detect PAHs attached to these substances in body tissues or blood. However, these tests cannot tell whether any health effects will occur or find out the extent or source of your exposure to the PAHs. The tests aren't usually available in your doctor's office because special equipment is needed to conduct them.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.2 milligrams of PAHs per cubic meter of air (0.2 mg/m^3). The OSHA Permissible Exposure Limit (PEL) for mineral oil mist that contains PAHs is 5 mg/m^3 averaged over an 8-hour exposure period.

The National Institute for Occupational Safety and Health (NIOSH) recommends that the average workplace air levels for coal tar products not exceed 0.1 mg/m^3 for a 10-hour workday, within a 40-hour workweek. There are other limits for workplace exposure for things that contain PAHs, such as coal, coal tar, and mineral oil.

Glossary

Carcinogen: A substance that can cause cancer.

Ingest: Take food or drink into your body.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

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POLYCHLORINATED BIPHENYLS

Division of Toxicology ToxFAQs™ **February 2001**

This fact sheet answers the most frequently asked health questions (FAQs) about polychlorinated biphenyls. For more information, 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. It's 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: 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?

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, and old microscope and hydraulic oils.

What happens to 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.

How might I be exposed to 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.

How can 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.

How likely are 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.

How can 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.

How can families reduce the risk of exposure to 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.

Is there a medical test to show whether I've been exposed to 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.

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.

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.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html . 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.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

TETRACHLOROETHYLENE
CAS # 127-18-4

This fact sheet answers the most frequently asked health questions (FAQs) about tetrachloroethylene. For more information, 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. It's 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: Tetrachloroethylene is a manufactured chemical used for dry cleaning and metal degreasing. Exposure to very high concentrations of tetrachloroethylene can cause dizziness, headaches, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death. Tetrachloroethylene has been found in at least 771 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is tetrachloroethylene?

(Pronounced tĕt′rə-klôr′ ō-ĕth′ə-lēn′)

Tetrachloroethylene is a manufactured chemical that is widely used for dry cleaning of fabrics and for metal-degreasing. It is also used to make other chemicals and is used in some consumer products.

Other names for tetrachloroethylene include perchloroethylene, PCE, and tetrachloroethene. It is a nonflammable liquid at room temperature. It evaporates easily into the air and has a sharp, sweet odor. Most people can smell tetrachloroethylene when it is present in the air at a level of 1 part tetrachloroethylene per million parts of air (1 ppm) or more, although some can smell it at even lower levels.

What happens to tetrachloroethylene when it enters the environment?

- Much of the tetrachloroethylene that gets into water or soil evaporates into the air.
- Microorganisms can break down some of the tetrachloroethylene in soil or underground water.
- In the air, it is broken down by sunlight into other chemicals or brought back to the soil and water by rain.
- It does not appear to collect in fish or other animals that live in water.

How might I be exposed to tetrachloroethylene?

- When you bring clothes from the dry cleaners, they will release small amounts of tetrachloroethylene into the air.
- When you drink water containing tetrachloroethylene, you are exposed to it.

How can tetrachloroethylene affect my health?

High concentrations of tetrachloroethylene (particularly in closed, poorly ventilated areas) can cause dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death.

Irritation may result from repeated or extended skin contact with it. These symptoms occur almost entirely in work (or hobby) environments when people have been accidentally exposed to high concentrations or have intentionally used tetrachloroethylene to get a "high."

In industry, most workers are exposed to levels lower than those causing obvious nervous system effects. The health effects of breathing in air or drinking water with low levels of tetrachloroethylene are not known.

Results from some studies suggest that women who work in dry cleaning industries where exposures to tetrachloroethyl-

ene can be quite high may have more menstrual problems and spontaneous abortions than women who are not exposed. However, it is not known if tetrachloroethylene was responsible for these problems because other possible causes were not considered.

Results of animal studies, conducted with amounts much higher than those that most people are exposed to, show that tetrachloroethylene can cause liver and kidney damage. Exposure to very high levels of tetrachloroethylene can be toxic to the unborn pups of pregnant rats and mice. Changes in behavior were observed in the offspring of rats that breathed high levels of the chemical while they were pregnant.

How likely is tetrachloroethylene to cause cancer?

The Department of Health and Human Services (DHHS) has determined that tetrachloroethylene may reasonably be anticipated to be a carcinogen. Tetrachloroethylene has been shown to cause liver tumors in mice and kidney tumors in male rats.

Is there a medical test to show whether I've been exposed to tetrachloroethylene?

One way of testing for tetrachloroethylene exposure is to measure the amount of the chemical in the breath, much the same way breath-alcohol measurements are used to determine the amount of alcohol in the blood.

Because it is stored in the body's fat and slowly released into the bloodstream, tetrachloroethylene can be detected in the breath for weeks following a heavy exposure.

Tetrachloroethylene and trichloroacetic acid (TCA), a breakdown product of tetrachloroethylene, can be detected in the blood. These tests are relatively simple to perform. These tests aren't available at most doctors' offices, but can be performed at special laboratories that have the right equipment.

Because exposure to other chemicals can produce the same breakdown products in the urine and blood, the tests for breakdown products cannot determine if you have been exposed to tetrachloroethylene or the other chemicals.

Has the federal government made recommendations to protect human health?

The EPA maximum contaminant level for the amount of tetrachloroethylene that can be in drinking water is 0.005 milligrams tetrachloroethylene per liter of water (0.005 mg/L).

The Occupational Safety and Health Administration (OSHA) has set a limit of 100 ppm for an 8-hour workday over a 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends that tetrachloroethylene be handled as a potential carcinogen and recommends that levels in workplace air should be as low as possible.

Glossary

Carcinogen: A substance with the ability to cause cancer.

CAS: Chemical Abstracts Service.

Milligram (mg): One thousandth of a gram.

Nonflammable: Will not burn.

References

This ToxFAQs information is taken from the 1997 Toxicological Profile for Tetrachloroethylene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone:1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html 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.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

TRICHLOROETHYLENE

CAS # 79-01-6

Division of Toxicology ToxFAQs™ **July 2003**

This fact sheet answers the most frequently asked health questions (FAQs) about trichloroethylene. For more information, 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: Trichloroethylene is a colorless liquid which is used as a solvent for cleaning metal parts. Drinking or breathing high levels of trichloroethylene may cause nervous system effects, liver and lung damage, abnormal heartbeat, coma, and possibly death. Trichloroethylene has been found in at least 852 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is trichloroethylene?

Trichloroethylene (TCE) is a nonflammable, colorless liquid with a somewhat sweet odor and a sweet, burning taste. It is used mainly as a solvent to remove grease from metal parts, but it is also an ingredient in adhesives, paint removers, typewriter correction fluids, and spot removers.

Trichloroethylene is not thought to occur naturally in the environment. However, it has been found in underground water sources and many surface waters as a result of the manufacture, use, and disposal of the chemical.

What happens to trichloroethylene when it enters the environment?

- Trichloroethylene dissolves a little in water, but it can remain in ground water for a long time.
- Trichloroethylene quickly evaporates from surface water, so it is commonly found as a vapor in the air.
- Trichloroethylene evaporates less easily from the soil than from surface water. It may stick to particles and remain for a long time.
- Trichloroethylene may stick to particles in water, which will cause it to eventually settle to the bottom sediment.
- Trichloroethylene does not build up significantly in plants and animals.

How might I be exposed to trichloroethylene?

- Breathing air in and around the home which has been contaminated with trichloroethylene vapors from shower water or household products such as spot removers and typewriter correction fluid.
- Drinking, swimming, or showering in water that has been contaminated with trichloroethylene.
- Contact with soil contaminated with trichloroethylene, such as near a hazardous waste site.
- Contact with the skin or breathing contaminated air while manufacturing trichloroethylene or using it at work to wash paint or grease from skin or equipment.

How can trichloroethylene affect my health?

Breathing small amounts may cause headaches, lung irritation, dizziness, poor coordination, and difficulty concentrating.

Breathing large amounts of trichloroethylene may cause impaired heart function, unconsciousness, and death. Breathing it for long periods may cause nerve, kidney, and liver damage.

ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html

Drinking large amounts of trichloroethylene may cause nausea, liver damage, unconsciousness, impaired heart function, or death.

Drinking small amounts of trichloroethylene for long periods may cause liver and kidney damage, impaired immune system function, and impaired fetal development in pregnant women, although the extent of some of these effects is not yet clear.

Skin contact with trichloroethylene for short periods may cause skin rashes.

How likely is trichloroethylene to cause cancer?

Some studies with mice and rats have suggested that high levels of trichloroethylene may cause liver, kidney, or lung cancer. Some studies of people exposed over long periods to high levels of trichloroethylene in drinking water or in workplace air have found evidence of increased cancer. Although, there are some concerns about the studies of people who were exposed to trichloroethylene, some of the effects found in people were similar to effects in animals.

In its 9th Report on Carcinogens, the National Toxicology Program (NTP) determined that trichloroethylene is "reasonably anticipated to be a human carcinogen." The International Agency for Research on Cancer (IARC) has determined that trichloroethylene is "probably carcinogenic to humans."

Is there a medical test to show whether I've been exposed to trichloroethylene?

If you have recently been exposed to trichloroethylene, it can be detected in your breath, blood, or urine. The breath test, if it is performed soon after exposure, can tell if you have been exposed to even a small amount of trichloroethylene.

Exposure to larger amounts is assessed by blood and urine tests, which can detect trichloroethylene and many of its breakdown products for up to a week after exposure. However, exposure to other similar chemicals can produce the same breakdown products, so their detection is not absolute proof of exposure to trichloroethylene. This test isn't available at most doctors' offices, but can be done at special laboratories that have the right equipment.

Has the federal government made recommendations to protect human health?

The EPA has set a maximum contaminant level for trichloroethylene in drinking water at 0.005 milligrams per liter (0.005 mg/L) or 5 parts of TCE per billion parts water.

The EPA has also developed regulations for the handling and disposal of trichloroethylene.

The Occupational Safety and Health Administration (OSHA) has set an exposure limit of 100 parts of trichloroethylene per million parts of air (100 ppm) for an 8-hour workday, 40-hour workweek.

Glossary

Carcinogenicity: The ability of a substance to cause cancer.
CAS: Chemical Abstracts Service.
Evaporate: To change into a vapor or gas.
Milligram (mg): One thousandth of a gram.
Nonflammable: Will not burn.
ppm: Parts per million.
Sediment: Mud and debris that have settled to the bottom of a body of water.
Solvent: A chemical that dissolves other substances.

References

This ToxFAQs information is taken from the 1997 Toxicological Profile for Trichloroethylene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html . 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.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

TOLUENE
CAS # 108-88-3

Division of Toxicology ToxFAQs™ **February 2001**

This fact sheet answers the most frequently asked health questions (FAQs) about toluene. For more information, 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. It's 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 toluene occurs from breathing contaminated workplace air, in automobile exhaust, some consumer products paints, paint thinners, fingernail polish, lacquers, and adhesives. Toluene affects the nervous system. Toluene has been found at 959 of the 1,591 National Priority List sites identified by the Environmental Protection Agency

What is toluene?

Toluene is a clear, colorless liquid with a distinctive smell. Toluene occurs naturally in crude oil and in the tolu tree. It is also produced in the process of making gasoline and other fuels from crude oil and making coke from coal.

Toluene is used in making paints, paint thinners, fingernail polish, lacquers, adhesives, and rubber and in some printing and leather tanning processes.

What happens to toluene when it enters the environment?

❑ Toluene enters the environment when you use materials that contain it. It can also enter surface water and groundwater from spills of solvents and petrolieum products as well as from leasking underground storage tanks at gasoline stations and other facilities.

❑ When toluene-containing products are placed in landfills or waste disposal sites, the toluene can enter the soil or water near the waste site.

❑ Toluene does not usually stay in the environment long.

❑ Toluene does not concentrate or buildup to high levels in animals.

How might I be exposed to toluene?

❑ Breathing contaminated workplace air or automobile exhaust.

❑ Working with gasoline, kerosene, heating oil, paints, and lacquers.

❑ Drinking contaminated well-water.

❑ Living near uncontrolled hazardous waste sites containing toluene products.

How can toluene affect my health?

Toluene may affect the nervous system. Low to moderate levles can cause tiredness, confusion, weakness, drunken-type actions, memory loss, nausea, loss of appetite, and

hearing and color vision loss. These symptoms usually disappear when exposure is stopped.

Inhaling High levels of toluene in a short time can make you feel light-headed, dizzy, or sleepy. It can also cause unconsciousness, and even death.

High levels of toluene may affect your kidneys.

How likely is toluene to cause cancer?

Studies in humans and animals generally indicate that toluene does not cause cancer.

The EPA has determined that the carcinogenicity of toluene can not be classified.

How can toluene affect children?

It is likely that health effects seen in children exposed to toluene will be similar to the effects seen in adults. Some studies in animals suggest that babies may be more sensitive than adults.

Breathing very high levels of toluene during pregnancy can result in children with birth defects and retard mental abilities, and growth. We do not know if toluene harms the unborn child if the mother is exposed to low levels of toluene during pregnancy.

How can families reduce the risk of exposure to toluene?

❑ Use toluene-containing products in well-ventilated areas.

❑ When not in use, toluene-containing products should be tightly covered to prevent evaporation into the air.

Is there a medical test to show whether I've been exposed to toluene?

There are tests to measure the level of toluene or its breakdown products in exhaled air, urine, and blood. To determine if you have been exposed to toluene, your urine or blood must be checked within 12 hours of exposure. Several other chemicals are also changed into the same breakdown products as toluene, so some of these tests are not specific for toluene.

Has the federal government made recommendations to protect human health?

EPA has set a limit of 1 milligram per liter of drinking water (1 mg/L).

Discharges, releases, or spills of more than 1,000 pounds of toluene must be reported to the National Response Center.

The Occupational Safety and Health Administration has set a limit of 200 parts toluene per million of workplace air (200 ppm).

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological Profile for Toluene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html . 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.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

TOTAL PETROLEUM HYDROCARBONS (TPH)

Agency for Toxic Substances and Disease Registry ToxFAQs **August 1999**

This fact sheet answers the most frequently asked health questions (FAQs) about total petroleum hydrocarbons (TPH). For more information, 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. It's 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: TPH is a mixture of many different compounds. Everyone is exposed to TPH from many sources, including gasoline pumps, spilled oil on pavement, and chemicals used at home or work. Some TPH compounds can affect your nervous system, causing headaches and dizziness. TPH has been found in at least 23 of the 1,467 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What are total petroleum hydrocarbons?

(Pronounced tōt′l pə-trō′lē-əm hī′drə-kär′bənz)

Total petroleum hydrocarbons (TPH) is a term used to describe a large family of several hundred chemical compounds that originally come from crude oil. Crude oil is used to make petroleum products, which can contaminate the environment. Because there are so many different chemicals in crude oil and in other petroleum products, it is not practical to measure each one separately. However, it is useful to measure the total amount of TPH at a site.

TPH is a mixture of chemicals, but they are all made mainly from hydrogen and carbon, called hydrocarbons. Scientists divide TPH into groups of petroleum hydrocarbons that act alike in soil or water. These groups are called petroleum hydrocarbon fractions. Each fraction contains many individual chemicals.

Some chemicals that may be found in TPH are hexane, jet fuels, mineral oils, benzene, toluene, xylenes, naphthalene, and fluorene, as well as other petroleum products and gasoline components. However, it is likely that samples of TPH will contain only some, or a mixture, of these chemicals.

What happens to TPH when it enters the environment?

- TPH may enter the environment through accidents, from industrial releases, or as byproducts from commercial or private uses.
- TPH may be released directly into water through spills or leaks.
- Some TPH fractions will float on the water and form surface films.
- Other TPH fractions will sink to the bottom sediments.
- Bacteria and microorganisms in the water may break down some of the TPH fractions.
- Some TPH fractions will move into the soil where they may stay for a long time.

How might I be exposed to TPH?

- Everyone is exposed to TPH from many sources.
- Breathing air at gasoline stations, using chemicals at home or work, or using certain pesticides.
- Drinking water contaminated with TPH.
- Working in occupations that use petroleum products.
- Living in an area near a spill or leak of petroleum products.
- Touching soil contaminated with TPH.

ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html

How can TPH affect my health?

Some of the TPH compounds can affect your central nervous system. One compound can cause headaches and dizziness at high levels in the air. Another compound can cause a nerve disorder called "peripheral neuropathy," consisting of numbness in the feet and legs. Other TPH compounds can cause effects on the blood, immune system, lungs, skin, and eyes.

Animal studies have shown effects on the lungs, central nervous system, liver, and kidney from exposure to TPH compounds. Some TPH compounds have also been shown to affect reproduction and the developing fetus in animals.

How likely is TPH to cause cancer?

The International Agency for Research on Cancer (IARC) has determined that one TPH compound (benzene) is carcinogenic to humans. IARC has determined that other TPH compounds (benzo[a]pyrene and gasoline) are probably and possibly carcinogenic to humans. Most of the other TPH compounds are considered not to be classifiable by IARC.

Is there a medical test to show whether I've been exposed to TPH?

There is no medical test that shows if you have been exposed to TPH. However, there are methods to determine if you have been exposed to some TPH compounds. Exposure to kerosene can be determined by its smell on the breath or clothing. Benzene can be measured in exhaled air and a breakdown product of benzene can be measured in urine. Other TPH compounds can be measured in blood, urine, breath, and some body tissues.

Has the federal government made recommendations to protect human health?

There are no regulations or advisories specific to TPH. The following are recommendations for some of the TPH fractions and compounds:

The EPA requires that spills or accidental releases into the environment of 10 pounds or more of benzene be reported to the EPA.

The Occupational Safety and Health Administration has set an exposure limit of 500 parts of petroleum distillates per million parts of air (500 ppm) for an 8-hour workday, 40-hour workweek.

Glossary

Carcinogenicity: Ability to cause cancer.

CAS: Chemical Abstracts Service.

Immune system: Body organs and cells that fight disease.

Pesticides: Chemicals used to kill pests.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for total petroleum hydrocarbons (TPH). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html 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.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

XYLENE
CAS # 1330-20-7

This fact sheet answers the most frequently asked health questions (FAQs) about xylene. For more information, 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. It's 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.

SUMMARY: Exposure to xylene occurs in the workplace and when you use paint, gasoline, paint thinners and other products that contain it. People who breathe high levels may have dizziness, confusion, and a change in their sense of balance. This substance has been found in at least 658 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is xylene?

(Pronounced zī′lēn)

Xylene is a colorless, sweet-smelling liquid that catches on fire easily. It occurs naturally in petroleum and coal tar and is formed during forest fires. You can smell xylene in air at 0.08–3.7 parts of xylene per million parts of air (ppm) and begin to taste it in water at 0.53–1.8 ppm.

Chemical industries produce xylene from petroleum. It's one of the top 30 chemicals produced in the United States in terms of volume.

Xylene is used as a solvent and in the printing, rubber, and leather industries. It is also used as a cleaning agent, a thinner for paint, and in paints and varnishes. It is found in small amounts in airplane fuel and gasoline.

What happens to xylene when it enters the environment?

- Xylene has been found in waste sites and landfills when discarded as used solvent, or in varnish, paint, or paint thinners.
- It evaporates quickly from the soil and surface water into the air.
- In the air, it is broken down by sunlight into other less harmful chemicals.
- It is broken down by microorganisms in soil and water.
- Only a small amount of it builds up in fish, shellfish, plants, and animals living in xylene-contaminated water.

How might I be exposed to xylene?

- Breathing xylene in workplace air or in automobile exhaust.
- Breathing contaminated air.
- Touching gasoline, paint, paint removers, varnish, shellac, and rust preventatives that contain it.
- Breathing cigarette smoke that has small amounts of xylene in it.
- Drinking contaminated water or breathing air near waste sites and landfills that contain xylene.
- The amount of xylene in food is likely to be low.

How can xylene affect my health?

Xylene affects the brain. High levels from exposure for short periods (14 days or less) or long periods (more than 1 year) can cause headaches, lack of muscle coordination, dizziness, confusion, and changes in one's sense of balance. Exposure of

people to high levels of xylene for short periods can also cause irritation of the skin, eyes, nose, and throat; difficulty in breathing; problems with the lungs; delayed reaction time; memory difficulties; stomach discomfort; and possibly changes in the liver and kidneys. It can cause unconsciousness and even death at very high levels.

Studies of unborn animals indicate that high concentrations of xylene may cause increased numbers of deaths, and delayed growth and development. In many instances, these same concentrations also cause damage to the mothers. We do not know if xylene harms the unborn child if the mother is exposed to low levels of xylene during pregnancy.

How likely is xylene to cause cancer?

The International Agency for Research on Cancer (IARC) has determined that xylene is not classifiable as to its carcinogenicity in humans.

Human and animal studies have not shown xylene to be carcinogenic, but these studies are not conclusive and do not provide enough information to conclude that xylene does not cause cancer.

Is there a medical test to show whether I've been exposed to xylene?

Laboratory tests can detect xylene or its breakdown products in exhaled air, blood, or urine. There is a high degree of agreement between the levels of exposure to xylene and the levels of xylene breakdown products in the urine. However, a urine sample must be provided very soon after exposure ends because xylene quickly leaves the body. These tests are not routinely available at your doctor's office.

Has the federal government made recommendations to protect human health?

The EPA has set a limit of 10 ppm of xylene in drinking water.

The EPA requires that spills or accidental releases of xylenes into the environment of 1,000 pounds or more must be reported.

The Occupational Safety and Health Administration (OSHA) has set a maximum level of 100 ppm xylene in workplace air for an 8-hour workday, 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) and the American Conference of Governmental Industrial Hygienists (ACGIH) also recommend exposure limits of 100 ppm in workplace air.

NIOSH has recommended that 900 ppm of xylene be considered immediately dangerous to life or health. This is the exposure level of a chemical that is likely to cause permanent health problems or death.

Glossary

Evaporate: To change from a liquid into a vapor or a gas.

Carcinogenic: Having the ability to cause cancer.

CAS: Chemical Abstracts Service.

ppm: Parts per million.

Solvent: A liquid that can dissolve other substances.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for xylenes (update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone:1-888-422-8737, FAX: 404-498-0093. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html 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.

APPENDIX B

WEST NILE VIRUS/ST. LOUIS ENCEPHALITIS PREVENTION

WEST NILE VIRUS/ ST. LOUIS ENCEPHALITIS PREVENTION

"AVOID MOSQUITO BITES TO AVOID INFECTION"

TO REDUCE THE CHANCE OF MOSQUITO CONTACT:

- Stay indoors at dawn, dusk, and in the early evening.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Spray clothing with repellents containing permethrin or DEET since mosquitoes may bite through thin clothing.
- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35% DEET (N,N-diethyl-meta-toluamide). DEET in high concentrations (greater than 35%) provides no additional protection.
- Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands of children.
- Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's DIRECTIONS FOR USE, as printed on the product.

Note: Vitamin B and "ultrasonic" devices are NOT effective in preventing mosquito bites.

SYMPTOMS OF WEST NILE VIRUS

Most infections are mild, and symptoms include fever, headache, and body aches, occasionally with skin rash and swollen lymph glands. More severe nfection may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and, rarely, death.

SYMPTOMS OF ST. LOUIS ENCEPHALITIS

Mild infections occur without apparent symptoms other than fever with headache. More sever infection is marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, occasional convulsions (especially infants) and spastic (but rarely flaccid) paralysis.

Information provided by the CDC Division of Vector-Borne Infectious Diseases. For additional information go to the Center for Disease Control and Prevention's website located at: http://www.cdc.gov/ or the New York City Department of Health's website located at: http://nycdoh.com/

APPENDIX C

REPORT FORMS

WEEKLY SAFETY REPORT FORM

Week Ending: _____ Project Name/Number: _____

Report Date: _____ Project Manager Name: _____

Summary of any violations of procedures occurring that week:

_____

_____

_____

Summary of any job related injuries, illnesses, or near misses that week:

_____

_____

_____

_____

Summary of air monitoring data that week (include and sample analyses, action levels exceeded, and actions taken):

_____

_____

_____

Comments:

_____

_____

_____

Name: _____ Company: _____

Signature: _____ Title: _____

INCIDENT REPORT FORM

Date of Report: _____

Injured: _____

Employer: _____

Site: _____ Site Location: _____

Report Prepared By: _____ _____
Signature Title

ACCIDENT/INCIDENT CATEGORY (check all that applies)

___Injury	___ Illness	___ Near Miss
__ Property Damage	___ Fire	___ Chemical Exposure
__ On-site Equipment	___ Motor Vehicle	___ Electrical
__ Mechanical	___ Spill	___ Other

DATE AND TIME OF ACCIDENT/INCIDENT: Narrative report of Accident/Incident: Identify: 1) actions leading to or contributing to the accident/incident; 2) the accident/incident occurrence; and 3) actions following the accident/incident.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

WITNESS TO ACCIDENT/INCIDENT:

Name:	_____	Company:	_____
Address:	_____	Address:	_____
Phone No.:	_____	Phone No.:	_____
Name:	_____	Company:	_____
Address:	_____	Address:	_____
Phone No.:	_____	Phone No.:	_____

INJURED - ILL:

Name: _____ SSN: _____

Address: _____ Age: _____

Length of Service: _____ Time on Present Job: _____

Time/Classification: _____

SEVERITY OF INJURY OR ILLNESS:

____ Disabling ___ Non-disabling ___ Fatality

____ Medical Treatment ___ First Aid Only

ESTIMATED NUMBER OF DAYS AWAY FROM JOB: _____

NATURE OF INJURY OR ILLNESS: _____

_____

_____

_____

CLASSIFICATION OF INJURY:

__ Abrasions _____ Dislocations ____ Punctures

__ Bites _____ Faint/Dizziness ____ Radiation Burns

__ Blisters _____ Fractures ____ Respiratory Allergy

__ Bruises _____ Frostbite ____ Sprains

__ Chemical Burns _____ Heat Burns ____ Toxic Resp. Exposure

__ Cold Exposure _____ Heat Exhaustion ____ Toxic Ingestion

__ Concussion _____ Heat Stroke ____ Dermal Allergy

__ Lacerations

Part of Body Affected: _____

Degree of Disability: _____

Date Medical Care was Received: _____

Where Medical Care was Received: _____

Address (if off-site): _____

(If two or more injuries, record on separate sheets)

PROPERTY DAMAGE:

Description of Damage: _____

_____

Cost of Damage: $ _____

ACCIDENT/INCIDENT LOCATION: _____

ACCIDENT/INCIDENT ANALYSIS: Causative agent most directly related to accident/incident (Object, substance, material, machinery, equipment, conditions)

_____

_____

_____

_____

Was weather a factor?:_____

_____

Unsafe mechanical/physical/environmental condition at time of accident/incident (Be specific):

_____

_____

_____

Personal factors (Attitude, knowledge or skill, reaction time, fatigue):

_____

_____

ON-SITE ACCIDENTS/INCIDENTS:

Level of personal protection equipment required in Site Safety Plan:

_____

_____

Modifications:

_____

Was injured using required equipment?:

_____

_____

If not, how did actual equipment use differ from plan?:

_____

_____

ACTION TAKEN TO PREVENT RECURRENCE: (Be specific. What has or will be done? When will it be done? Who is the responsible party to insure that the correction is made?

_____

_____

_____

_____

_____

ACCIDENT/INCIDENT REPORT REVIEWED BY:

_____ _____

SSO Name Printed SSO Signature

OTHERS PARTICIPATING IN INVESTIGATION:

_____ _____

Signature Title

_____ _____

Signature Title

_____ _____

Signature Title

ACCIDENT/INCIDENT FOLLOW-UP: Date: _____

Outcome of accident/incident: _____

_____

_____

_____

Physician's recommendations: _____

_____

_____

_____

Date injured returned to work: _____

Follow-up performed by:

_____ _____

Signature Title

ATTACH ANY ADDITIONAL INFORMATION TO THIS FORM

APPENDIX D

EMERGENCY HAND SIGNALS

EMERGENCY SIGNALS

In most cases, field personnel will carry portable radios for communication. If this is the case, a transmission that indicates an emergency will take priority over all other transmissions. All other site radios will yield the frequency to the emergency transmissions.

Where radio communications is not available, the following air-horn and/or hand signals will be used:

EMERGENCY HAND SIGNALS

OUT OF AIR, CAN'T BREATH!

Hand gripping throat

LEAVE AREA IMMEDIATELY, NO DEBATE!

(No Picture) Grip partner's wrist or place both hands around waist

NEED ASSISTANCE!

Hands on top of head

OKAY! – I'M ALL RIGHT!

- I UNDERSTAND!

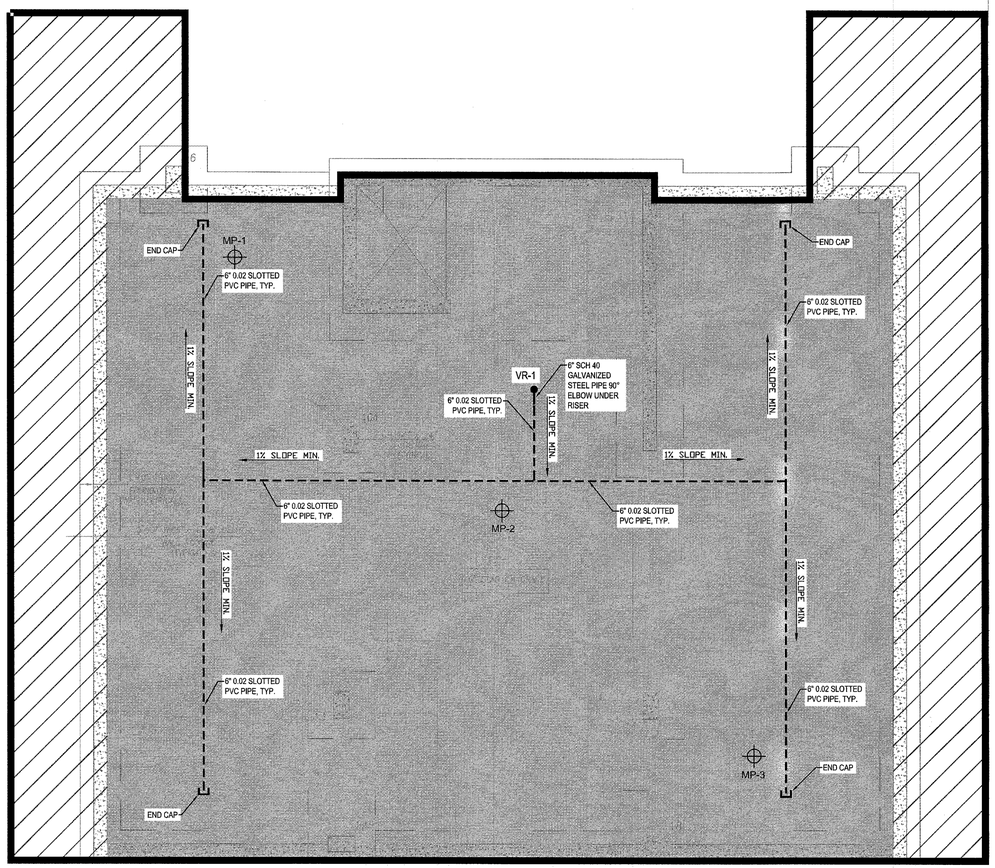
Thumbs up

NO! - NEGATIVE!

Thumbs down

APPENDIX 6

DESIGN DIAGRAMS AND SPECIFICATIONS FOR VAPOR BARRIER AND SUB-SLAB DEPRESSURIZATION SYSTEM



0 5 10
APPROXIMATE SCALE: 1" = 5'

MONITORING POINT LOCATIONS

ID	ROOM LOCATION (CELLAR LEVEL)
MP-1	COMPACTOR & RECYCLE ROOM
MP-2	HALLWAY
MP-3	BIKE ROOM

LEGEND

- HORIZONTAL EXTENT OF VAPOR BARRIER AND MINIMUM 6-INCH THICK GAS PERMEABLE AGGREGATE (REFER TO NOTE 2)
- 6-INCH 0.02 SLOTTED PVC PIPE BENEATH CELLAR FLOOR SLAB
- VR-1 — VERTICAL RISER AND IDENTIFICATION NUMBER (REFER TO DRAWING H205.00 DETAIL 3, 4, AND 5 FOR RISER CONSTRUCTION)
- MP-1 — SUB-SLAB MONITORING POINT AND IDENTIFICATION NUMBER (REFER TO DETAIL 6 ON DRAWING H204.00). LOCATIONS TO BE FIELD VERIFIED AND APPROVED BY ENGINEER
- EXTENT OF SUB-SLAB DEPRESSURIZATION SYSTEM WITH VAPOR BARRIER
- EXTENT OF VAPOR BARRIER

NOTES

1. THIS PLAN SHALL NOT TO BE USED FOR STRUCTURAL, ARCHITECTURAL OR OTHER REFERENCE PURPOSES EXCEPT FOR THE SUB-SLAB DEPRESSURIZATION SYSTEM.
2. THE EXTENTS OF THE BUILDING CONSTRUCTION BENEATH THE CELLAR SLABS SHALL BE LINED WITH STEGO WRAP 20 MIL VAPOR BARRIER, AS PART OF THE BUILDING CONSTRUCTION. THE STEGO WRAP 20 MIL VAPOR BARRIER SHALL ALSO BE APPLIED TO BELOW GRADE WALLS, BOTTOM SLABS AND THE WALLS OF PITS AND SUMPS AS SHOWN AND SPECIFIED.
3. SLOPE HORIZONTAL PIPE A MINIMUM OF 1% UNIFORMLY TOWARDS THE SUB-SLAB DEPRESSURIZATION SYSTEM SLOTTED PIPING OR TO CONDENSATE DRAINS WHEN PIPING CANNOT BE SLOPED TO THE SLOTTED PIPES.
4. REFER TO DRAWINGS H204.00, H205.00, AND SPECIFICATION SECTION 13284 FOR ADDITIONAL VAPOR BARRIER AND SUB-SLAB DEPRESSURIZATION SYSTEM REQUIREMENTS.
5. COORDINATE ALL WORK FOR SUB-SLAB DEPRESSURIZATION SYSTEM INSTALLATION WITH OTHER TRADES BEFORE INSTALLATION.
6. REFER TO DRAWING H202.00 AND H203.00FOR SUB-SLAB DEPRESSURIZATION SYSTEM RISER LOCATION UP TO ROOF.
7. REFER TO DRAWINGS H204.00 AND H205.00 FOR SUB-SLAB DEPRESSURIZATION SYSTEM PIPING, RISER, STEGO WRAP 20 MIL VAPOR BARRIER , AND GAS PERMEABLE AGGREGATE DETAILS AND SECTIONS.
8. EXISTING SOIL SHALL BE EXCAVATED AND A SUBGRADE PREPARATION SHALL BE PERFORMED PER SPECIFICATIONS AND GEOTECHNICAL REPORT. ADDITIONAL RECOMMENDATION (AROUND BUILDINGS) FOR PROTECTION AGAINST SOIL MOISTURE FLUCTUATION SHALL BE FOLLOWED.
9. ALL DIMENSIONS AND ELEVATIONS SHALL BE CHECKED AGAINST ARCHITECTURAL AND BUILDING PLANS. NOTIFY ENGINEER OF ANY DISCREPANCY PRIOR TO CONSTRUCTION.
10. CONTRACTOR IS TO PROTECT VAPOR BARRIER PRIOR TO POURING OF CONCRETE SLAB AND SIDEWALLS.
11. BASEMAP TAKEN FROM DRAWING FO-100.00 DATED 05/17/13 BY KARL FISCHER ARCHITECTS/ TSF ENGINEERING PC.

CODE COMPLIANCE NOTES:

1. THE SUB-SLAB DEPRESSURIZATION SYSTEM COMPLIES WITH THE REQUIREMENTS OF THE 2008 NYC MECHANICAL CODE SECTION 512, "SUB-SLAB SOIL EXHAUST SYSTEMS."
2. THE SUB-SLAB DEPRESSURIZATON SYSTEM IS NOT A "HAZARDOUS EXHAUST SYSTEM" AS DEFINED IN THE 2008 NYC MECHANICAL CODE SECTION 510.
3. 2008 NYC MECHANICAL CODE CHAPTER 6, "DUCT SYSTEMS", PARAGRAPH 601.3, "CONTAMINATION PREVENTION" DOES NOT APPLY TO THE SUB-SLAB DEPRESSURIZATION RISERS, WHICH ARE NOT UNDER PRESSURE.
4. 2008 NYC MECHANICAL CODE CHAPTER 6, "DUCT SYSTEMS", PARAGRAPH 607.5.5.2, "LIMITATIONS" DOES NOT APPLY TO THE SUB-SLAB DEPRESSURIZATION SYSTEM RISERS; HOWEVER, AKRF DOES NOT RECOMMEND INSTALLATION OF SSDS RISERS IN SHAFTS THAT CONTAIN DUCTWORK CONVEYING ENVIRONMENTAL AIR.

Consultants:
AKRF
AKRF ENGINEERING, P.C.
440 Park Avenue South, New York, NY 10016
(T) 212-696-0670

SSDS

Prepared For:
Bleeker Street Gardens, LLC.
708 Sharrotts Road
Staten Island, NY 10309

DRAFT

No.	Date	Revision

:

Discipline Lead:	M. GODICK
Designer:	D. SHAPIRO
Drawn by:	S. KENNEY
Checked by:	M. LAPIN, PE
AKRF PROJECT NUMBER: 11686	Date: 08/15/2013

Project:
1041-1047 FULTON STREET
BROOKLYN, NY 11238

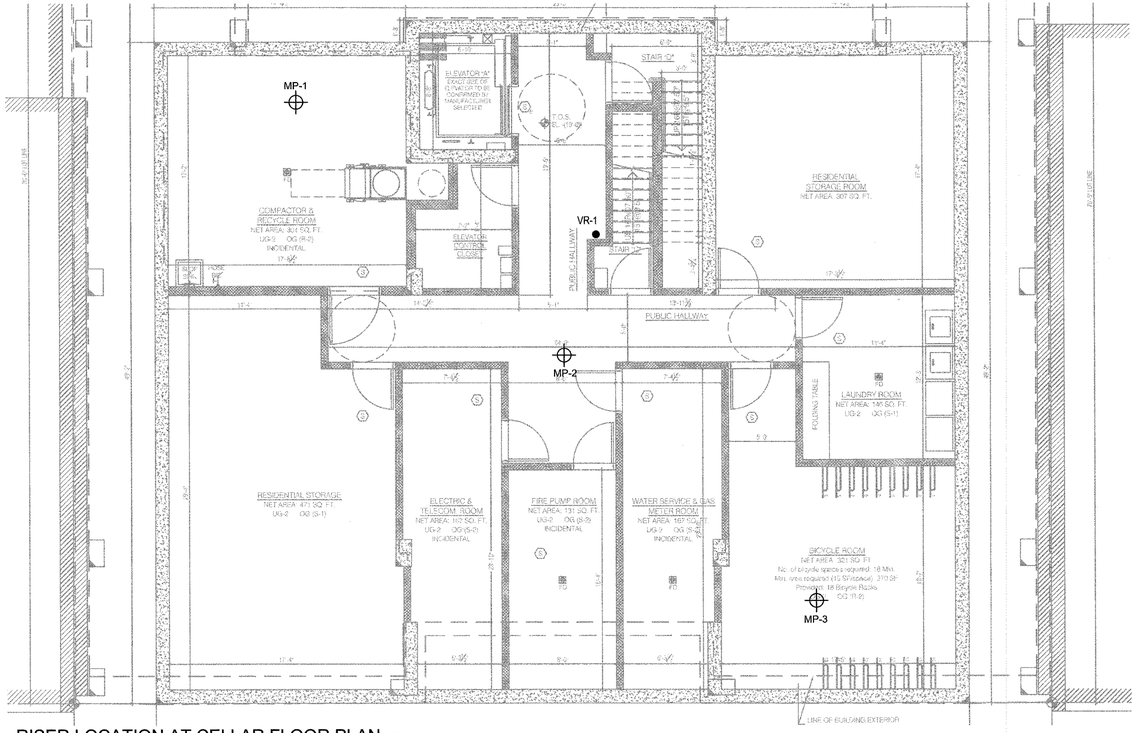
Drawing Title:
SUB-SLAB DEPRESSURIZATION SYSTEM PLAN

STATE OF NEW YORK · MICHELLE LAPIN · LICENSED PROFESSIONAL ENGINEER

Drawing No.:
H201.00

Sheets in Contract Set: 1 of 5

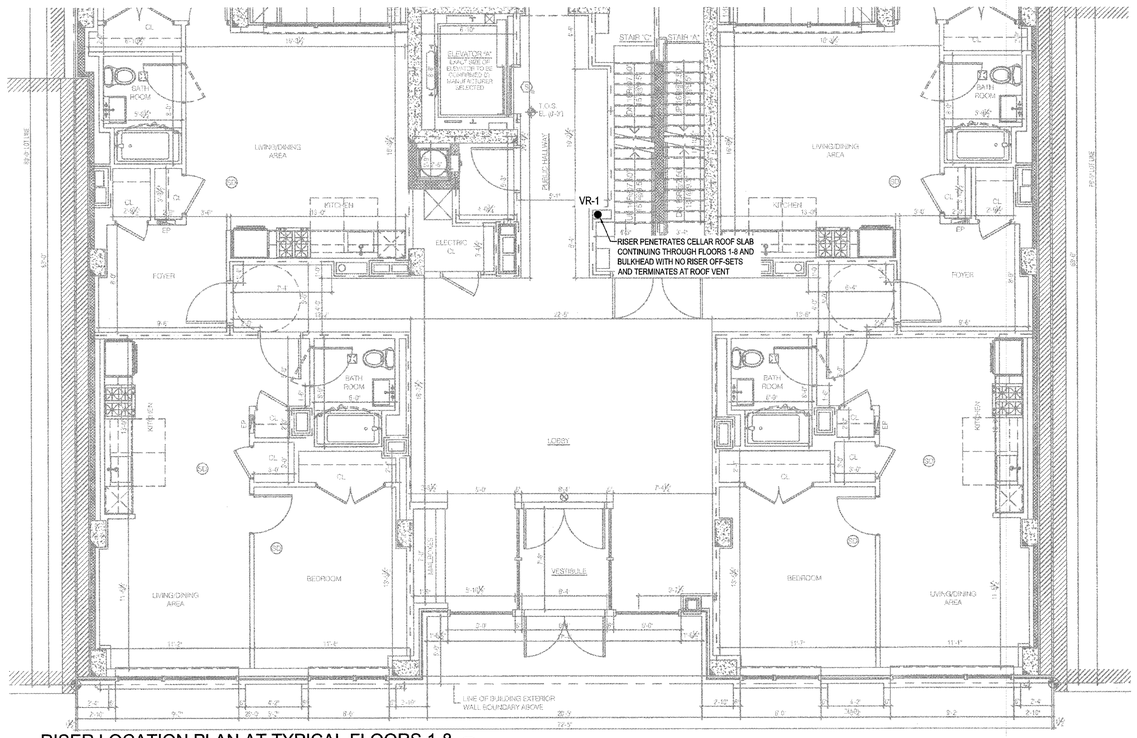
Sheets in DOB Set: of



RISER LOCATION AT CELLAR FLOOR PLAN ①

0 5 10

APPROXIMATE SCALE: 1" = 5'



RISER LOCATION PLAN AT TYPICAL FLOORS 1-8 ②

0 5 10

APPROXIMATE SCALE: 1" = 5'

LEGEND

●	VR-1	VERTICAL RISER AND IDENTIFICATION NUMBER. EXTEND THROUGH BULKHEAD TO SUCTION FAN (REFER TO DETAIL 2, 3, AND 4 ON DRAWING H205.00)
⊕	MP-1	SUB-SLAB MONITORING POINT AND IDENTIFICATION NUMBER (REFER TO DETAIL 6 ON DRAWING H204.00). LOCATIONS TO BE FIELD VERIFIED AND APPROVED BY ENGINEER

NOTES

1. THIS PLAN SHALL NOT TO BE USED FOR STRUCTURAL, ARCHITECTURAL OR OTHER REFERENCE PURPOSES EXCEPT FOR THE SUB-SLAB DEPRESSURIZATION SYSTEM.
2. THE EXTENTS OF THE BUILDING CONSTRUCTION BENEATH THE CELLAR SLABS SHALL BE LINED WITH STEGO WRAP 20 MIL VAPOR BARRIER. AS PART OF THE BUILDING CONSTRUCTION, THE STEGO WRAP 20 MIL VAPOR BARRIER SHALL ALSO BE APPLIED TO BELOW GRADE WALLS, BOTTOM SLABS AND THE WALLS OF PITS AND SUMPS AS SHOWN AND SPECIFIED.
3. SLOPE HORIZONTAL PIPE A MINIMUM OF 1% UNIFORMLY TOWARDS THE SUB-SLAB DEPRESSURIZATION SYSTEM SLOTTED PIPING OR TO CONDENSATE DRAINS WHEN PIPING CANNOT BE SLOPED TO THE SLOTTED PIPES.
4. REFER TO DRAWINGS H204.00, H205.00, AND SPECIFICATION SECTION 13284 FOR ADDITIONAL VAPOR BARRIER AND SUB-SLAB DEPRESSURIZATION SYSTEM REQUIREMENTS.
5. REFER TO DRAWING H205.00 FOR ADDITIONAL SUB-SLAB DEPRESSURIZATION SYSTEM ACCESSORIES REQUIREMENTS.
6. COORDINATE ALL WORK FOR SUB-SLAB DEPRESSURIZATION SYSTEM INSTALLATION WITH OTHER TRADES BEFORE INSTALLATION.
7. REFER TO DRAWINGS H204.00 AND H205.00 FOR SUB-SLAB DEPRESSURIZATION SYSTEM PIPING, RISER, STEGO WRAP 20 MIL VAPOR BARRIER , AND GAS PERMEABLE AGGREGATE DETAILS AND SECTIONS.
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10. CONTRACTOR IS TO PROTECT VAPOR BARRIER PRIOR TO POURING OF CONCRETE SLAB AND SIDEWALLS.
11. BASEMAP TAKEN FROM DRAWING FO-100.00 DATED 05/17/13 BY KARL FISCHER ARCHITECTS/ TSF ENGINEERING PC.

CODE COMPLIANCE NOTES:

1. THE SUB-SLAB DEPRESSURIZATION SYSTEM COMPLIES WITH THE REQUIREMENTS OF THE 2008 NYC MECHANICAL CODE SECTION 512, "SUB-SLAB SOIL EXHAUST SYSTEMS."
2. THE SUB-SLAB DEPRESSURIZATON SYSTEM IS NOT A "HAZARDOUS EXHAUST SYSTEM" AS DEFINED IN THE 2008 NYC MECHANICAL CODE SECTION 510.
3. 2008 NYC MECHANICAL CODE CHAPTER 6, "DUCT SYSTEMS", PARAGRAPH 601.3, "CONTAMINATION PREVENTION" DOES NOT APPLY TO THE SUB-SLAB DEPRESSURIZATION RISERS, WHICH ARE NOT UNDER PRESSURE.
4. 2008 NYC MECHANICAL CODE CHAPTER 6, "DUCT SYSTEMS", PARAGRAPH 607.5.5.2, "LIMITATIONS" DOES NOT APPLY TO THE SUB-SLAB DEPRESSURIZATION SYSTEM RISERS; HOWEVER, AKRF DOES NOT RECOMMEND INSTALLATION OF SSDS RISERS IN SHAFTS THAT CONTAIN DUCTWORK CONVEYING ENVIRONMENTAL AIR.

Consultants:

AKRF

AKRF ENGINEERING, P.C.
440 Park Avenue South, New York, NY 10016
(T) 212-696-0670

SSDS

Prepared For:
Bleeker Street Gardens, LLC.
708 Sharrotts Road
Staten Island, NY 10309

DRAFT

No.	Date	Revision

Discipline Lead:	M. GODICK
Designer:	D. SHAPIRO
Drawn by:	S. KENNEY
Checked by:	M. LAPIN, PE
AKRF PROJECT NUMBER: 11686	Date: 08/15/2013

Project:
1041-1047 FULTON STREET
BROOKLYN, NY 11238

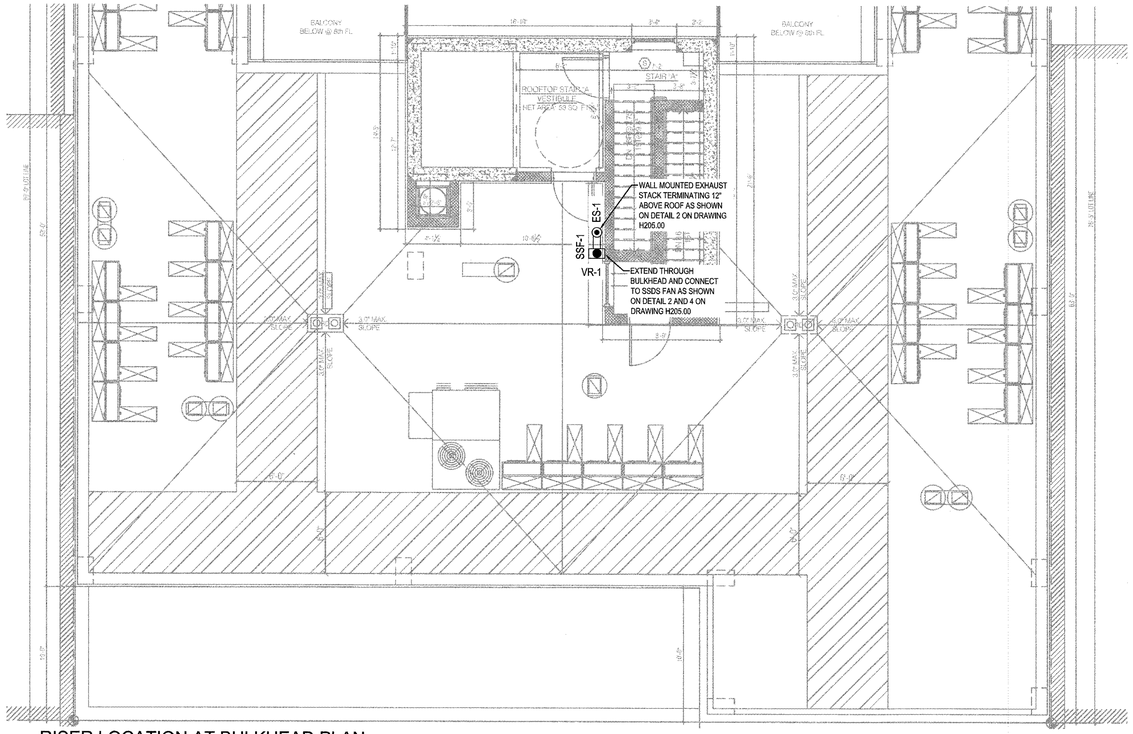
Drawing Title:
SUB-SLAB DEPRESSURIZATION SYSTEM PLAN: CELLAR AND TYPICAL FLOOR (1-8)

STATE OF NEW YORK · MICHELLE LAPIN · No. 071938 · LICENSED PROFESSIONAL ENGINEER

Drawing No.: H202.00

Sheets in Contract Set: 2 of 5

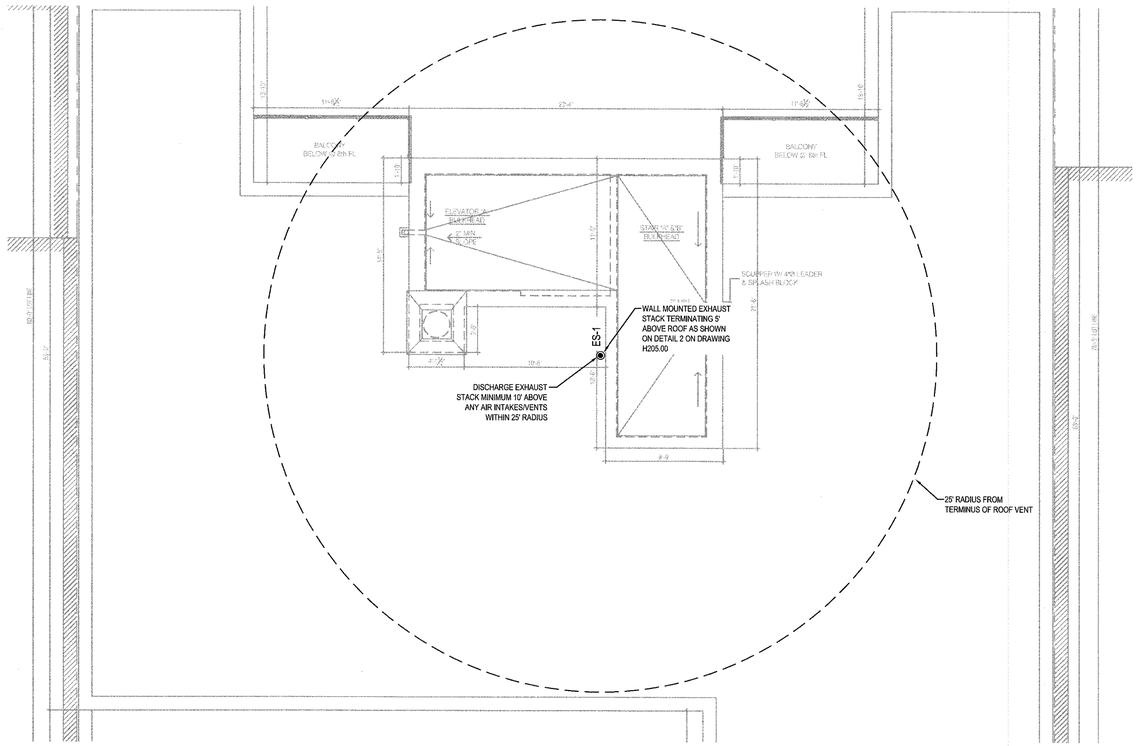
Sheets in DOB Set: of



RISER LOCATION AT BULKHEAD PLAN ①

0 5 10

APPROXIMATE SCALE: 1" = 5'



RISER LOCATION AT ROOF PLAN ②

0 5 10

APPROXIMATE SCALE: 1" = 5'

LEGEND

●	VR-1	VERTICAL RISER AND IDENTIFICATION NUMBER. EXTEND THROUGH BULKHEAD TO SUCTION FAN (REFER TO DETAIL 2, 3, AND 4 ON DRAWING H205.00)
	SSF-1	SUCTION FAN AND STACK (REFER TO DETAILS 1 AND 4 ON DRAWING H205.00) (NOT TO SCALE)
◉	ES-1	SUCTION FAN EXHAUST STACK (SEE DETAIL 1 ON H205.00)

NOTES

1. THIS PLAN SHALL NOT TO BE USED FOR STRUCTURAL, ARCHITECTURAL OR OTHER REFERENCE PURPOSES EXCEPT FOR THE SUB-SLAB DEPRESSURIZATION SYSTEM.
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5. REFER TO DRAWING H205.00 FOR ADDITIONAL SUB-SLAB DEPRESSURIZATION SYSTEM ACCESSORIES REQUIREMENTS.
6. COORDINATE ALL WORK FOR SUB-SLAB DEPRESSURIZATION SYSTEM INSTALLATION WITH OTHER TRADES BEFORE INSTALLATION.
7. REFER TO DRAWINGS H204.00 AND H205.00 FOR SUB-SLAB DEPRESSURIZATION SYSTEM PIPING, RISER, STEGO WRAP 20 MIL VAPOR BARRIER , AND GAS PERMEABLE AGGREGATE DETAILS AND SECTIONS.
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11. BASEMAP TAKEN FROM DRAWING FO-100.00 DATED 05/17/13 BY KARL FISCHER ARCHITECTS/ TSF ENGINEERING PC.

CODE COMPLIANCE NOTES:

1. THE SUB-SLAB DEPRESSURIZATION SYSTEM COMPLIES WITH THE REQUIREMENTS OF THE 2008 NYC MECHANICAL CODE SECTION 512, "SUB-SLAB SOIL EXHAUST SYSTEMS."
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Consultants:

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AKRF ENGINEERING, P.C.
440 Park Avenue South, New York, NY 10016
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SSDS

Prepared For:

Bleeker Street Gardens, LLC.
708 Sharrotts Road
Staten Island, NY 10309

DRAFT

No.	Date	Revision
:		

Discipline Lead:	M. GODICK
Designer:	D. SHAPIRO
Drawn by:	S. KENNEY
Checked by:	M. LAPIN, PE
AKRF PROJECT NUMBER: 11686	Date: 08/15/2013

Project:

1041-1047 FULTON STREET
BROOKLYN, NY 11238

Drawing Title:

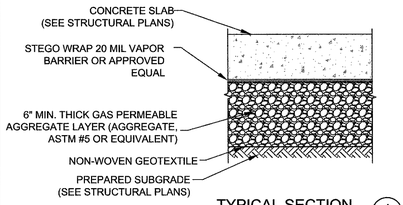
SUB-SLAB DEPRESSURIZATION SYSTEM PLAN: BULKHEAD AND ROOF

STATE OF NEW YORK · MICHELLE LAPIN · 076393 · LICENSED PROFESSIONAL ENGINEER

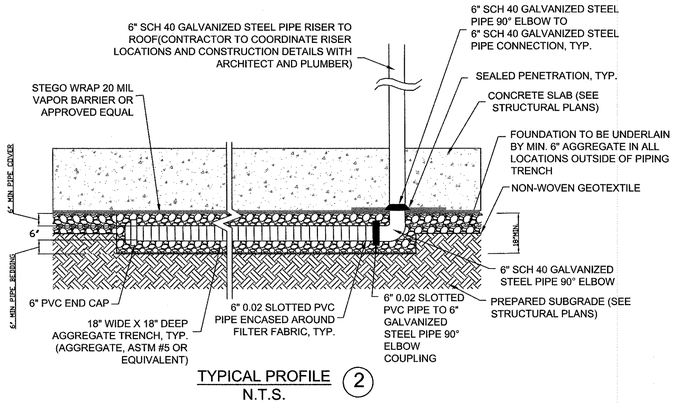
Drawing No.: H203.00

Sheets in Contract Set: 3 of 5

Sheets in DOB Set: of



TYPICAL SECTION THROUGH SUB SLAB (1)
N.T.S.



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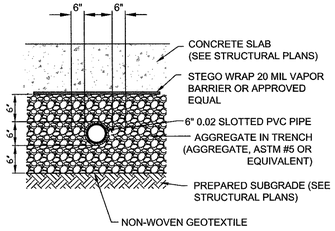
N.T.S.



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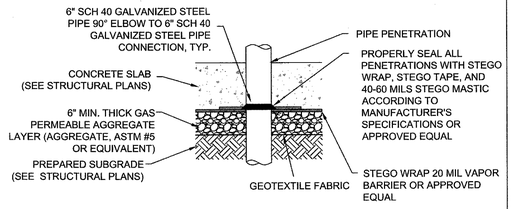
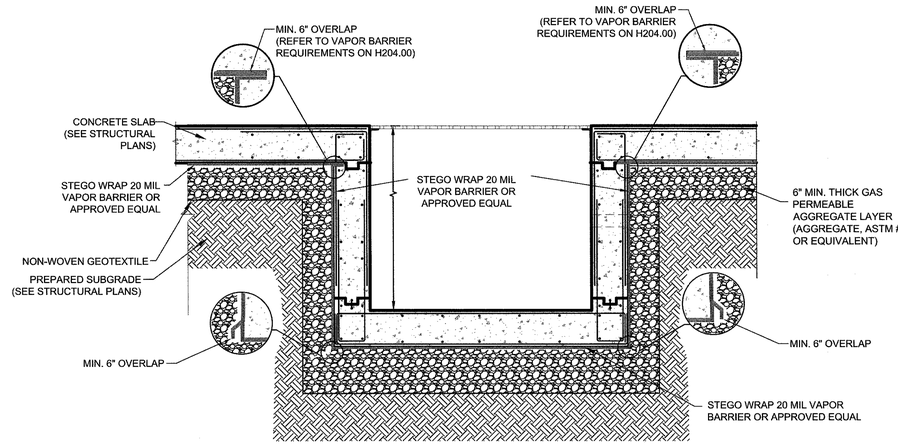


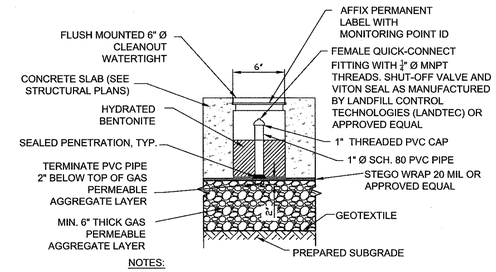
TYPICAL VAPOR BARRIER PENETRATION (4)
N.T.S.



NOTES:

1. SEAL ANY PIPE PENETRATIONS IN PIT WALL IN ACCORDANCE WITH DETAIL 4 OF THIS DRAWING.

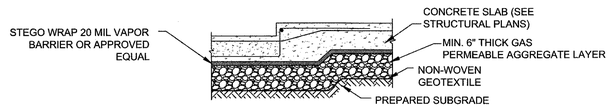
VAPOR BARRIER DETAIL AT GRADE DEPRESSION OR TYPICAL ELEVATOR / SUMP PIT / UTILITY PIT, ETC. (5)
N.T.S.



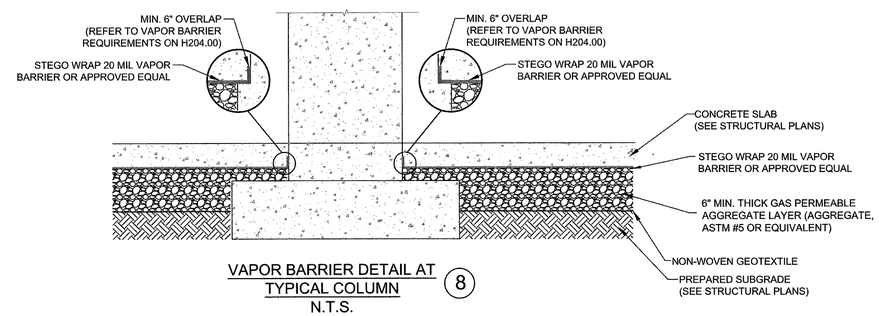
NOTES:

1. ANY DEVIATION FROM THIS INSTALLATION MUST BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

TYPICAL MONITORING POINT DETAIL (6)
N.T.S.



GAS VAPOR BARRIER DETAIL FOR SLAB-ON-GRADE AT DEPRESSION (7)
N.T.S.



VAPOR BARRIER DETAIL AT TYPICAL COLUMN (8)
N.T.S.

VAPOR BARRIER NOTES:

1. VAPOR BARRIER SHALL BE STEGO WRAP 20 MIL, OR APPROVED EQUIVALENT PRODUCT.
2. THE EXTENTS OF THE BUILDING CONSTRUCTION BENEATH THE FLOOR SLABS SHALL BE LINED WITH GAS VAPOR BARRIER. AS PART OF BUILDING CONSTRUCTION, THE VAPOR BARRIER SHALL ALSO BE APPLIED TO BELOW GRADE WALLS AND WALLS OF PITS AND SUMPS.
3. ALL PIPE AND CONDUIT PENETRATIONS THROUGH THE SLAB (INCLUDING MECHANICAL, ELECTRICAL, PLUMBING, OR OTHER) SHALL BE SEALED IN ACCORDANCE WITH THE VAPOR BARRIER MANUFACTURER'S SPECIFICATIONS.
4. INSTALL VAPOR BARRIER IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
5. RELATIVE VAPOR BARRIER THICKNESS EXAGGERATED ON DETAILS FOR ILLUSTRATIVE PURPOSES.
6. SUBMIT DETAIL OF ANY VAPOR BARRIER PENETRATION OR ATTACHMENT NOT SHOWN TO THE ENGINEER FOR APPROVAL.
7. CONTRACTOR TO VERIFY THAT UNDER DRAIN/INSULATION ATTACHMENT WILL NOT AFFECT VAPOR BARRIER INTEGRITY OR WARRANTY.
8. OVERLAP VAPOR BARRIER 6" ONTO PILE CAP OR FOOTING, OR ACCORDING TO MANUFACTURER'S SPECIFICATIONS FOR APPROVED EQUAL.
9. SUB-SLAB DEPRESSURIZATION SYSTEM DESIGN DETAILS TO BE UPDATED BASED ON FINALIZED ARCHITECTURAL DESIGN.
10. REFER TO DRAWING H205.00 FOR ADDITIONAL SUB-SLAB DEPRESSURIZATION SYSTEM AND VAPOR BARRIER REQUIREMENTS.

Consultants:
AKRF
AKRF ENGINEERING, P.C.
440 Park Avenue South, New York, NY 10016
(T) 212-696-0670

SSDS

Prepared For:
Bleeker Street Gardens, LLC.
708 Sharrotts Road
Staten Island, NY 10309

DRAFT

No. Date Revision

:

Discipline Lead:	M. GODICK
Designer:	D. SHAPIRO
Drawn by:	S. KENNEY
Checked by:	M. LAPIN, PE
AKRF PROJECT NUMBER: 11686	Date: 08/15/2013

Project:
1041-1047 FULTON STREET
BROOKLYN, NY 11238

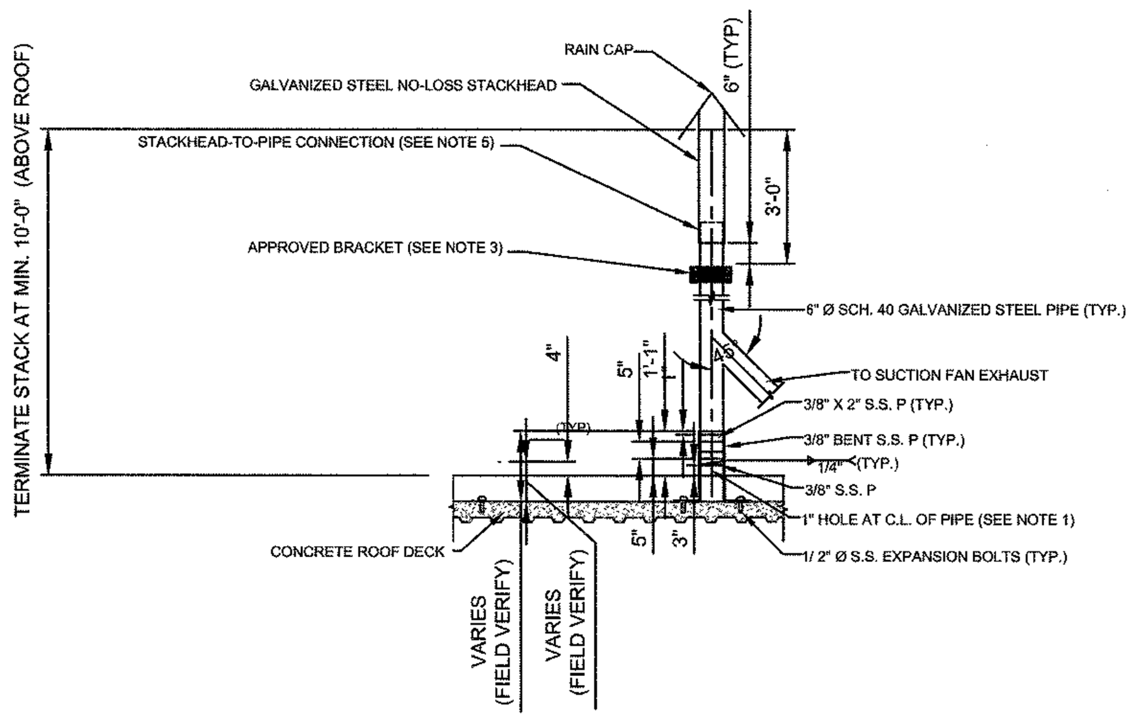
Drawing Title:
SUB-SLAB DEPRESSURIZATION SYSTEM DETAILS

STATE OF NEW YORK · MICHELLE LAPIN · 090436 · LICENSED PROFESSIONAL ENGINEER

Drawing No.: H204.00

Sheets in Contract Set: 4 of 5

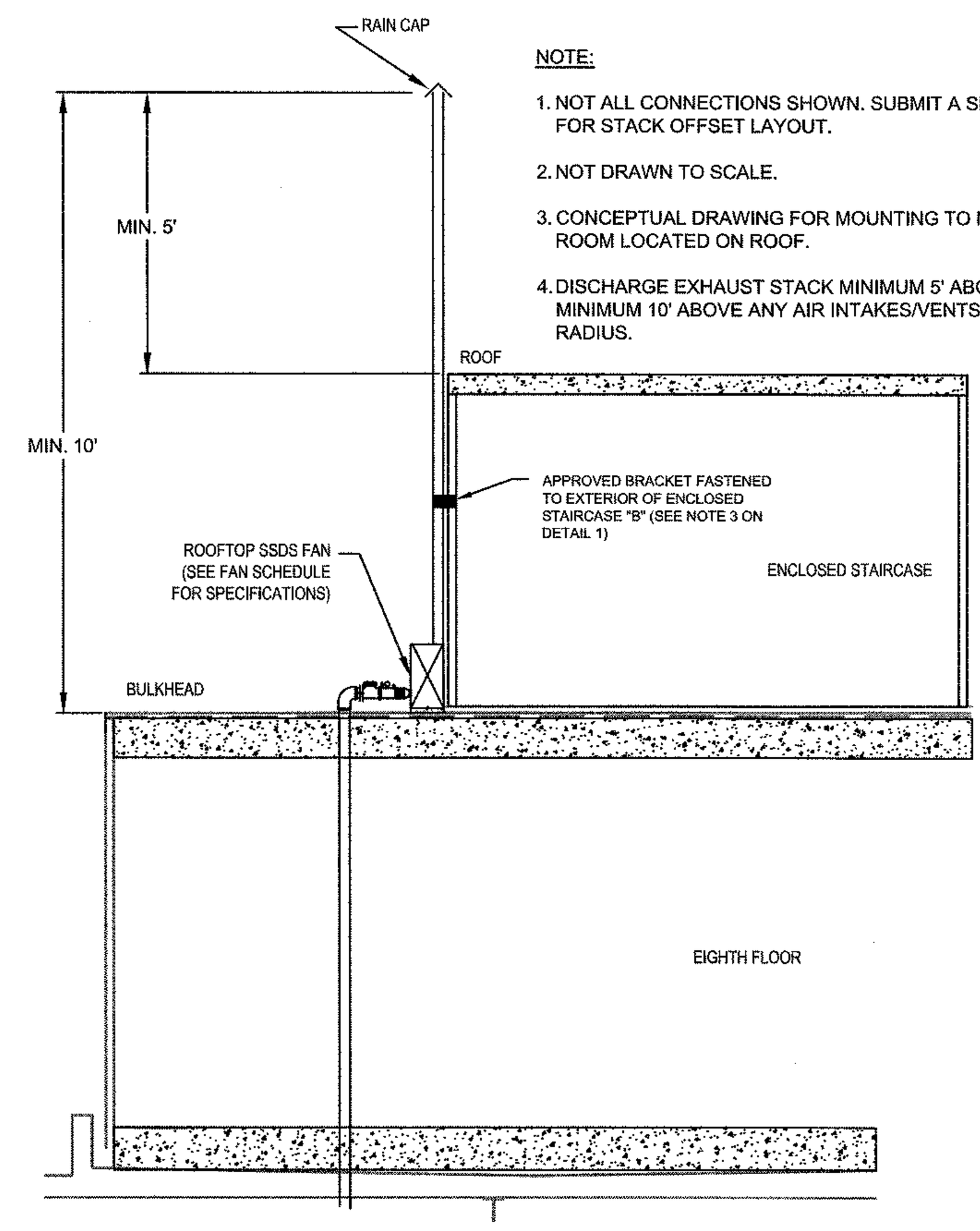
Sheets in DOB Set: of



EXHAUST STACK MOUNTING DETAIL (1)
N.T.S.

EXHAUST STACK NOTES:

1. PROVIDE PITCH POCKET IN PLATE FOR DRAINAGE.
2. ADJUST DIMENSIONS TO PROVIDE A TIGHT FIT BETWEEN THE PIPE AND THE BENT PLATE.
3. SECURE STACK TO EXTERIOR WALL USING APPROVED BRACKET IN ACCORDANCE WITH ARCHITECTURAL SPECIFICATIONS.
4. ALL PLATES, AND CLIPS SHALL BE ASTM G304 STAINLESS STEEL.
5. PROVIDE CONNECTION PER MANUFACTURER'S RECOMMENDATION OR USE (6) 1/4" ASTM G304 STAINLESS STEEL MACHINE SCREWS, DRILL AND TAP AS REQUIRED.
6. PROVIDE LIGHTNING ROD AND GROUNDING WIRE FOR BLOWER AS PER ELECTRICAL REQUIREMENTS.
7. COORDINATE ALL ROOF PENETRATIONS FOR FAN SUPPORT WITH OTHER TRADES.



NOTE:

1. NOT ALL CONNECTIONS SHOWN. SUBMIT A SHOP DRAWING FOR STACK OFFSET LAYOUT.
2. NOT DRAWN TO SCALE.
3. CONCEPTUAL DRAWING FOR MOUNTING TO MECHANICAL ROOM LOCATED ON ROOF.
4. DISCHARGE EXHAUST STACK MINIMUM 5' ABOVE ROOF AND MINIMUM 10' ABOVE ANY AIR INTAKES/VENTS WITHIN 25' RADIUS.

RISER PENETRATION AND EXHAUST STACK CROSS SECTION AT BULKHEAD AND ROOF (2)
N.T.S.

INSTRUMENT SCHEDULE							
ITEM	DESCRIPTION	SERVICE	LOCATION	REQUIREMENTS	RANGE	REMARKS	MANUFACTURER/MODEL
MAGNEHELIC GAUGE	PRESSURE DIFFERENTIAL	SSD SYSTEM	RISER	N/A	0-20 WC	FOR RISER	DWYER INSTRUMENTS INC. SERIES 2000
VI	VACUUM INDICATOR	SSD SYSTEM	SUCTION FAN	N/A	0-30 WC	FOR BLOWER ASSEMBLY	WIKA MODEL 612.20, PART 9747724
DPS	DIFFERENTIAL PRESSURE SWITCH	BMS	SUCTION FAN	N/A	0.4 - 1.6" WC	CONNECT TO BMS FOR BLOWER ASSEMBLY	DWYER INSTRUMENTS INC. SERIES 1900,MODEL 1910-1
CONTROL PANEL	SUCTION FAN	SSD SYSTEM	SUCTION FAN	1 PHASE, 60 HZ, 115 VOLT	N/A	FOR BLOWER	
FLOW METER AND DISPLAY	FLOW	SSD SYSTEM	RISER @ CELLAR FLOOR	1 PHASE, 60 HZ, 115 VOLT	N/A	FOR RISER	VORTEK VT-5000 AIRFLOW MEASUREMENT PROBE, TRANSMITTER AND OPTIONAL DISPLAY

FAN SCHEDULE												
UNIT NO.	AREAS SERVED	SERVICE	LOCATION	TYPE	SIZE	MIN. CFM	MIN. RATE (INCHES WC)	MOTOR REQUIREMENTS				MANUFACTURER/MODEL
SF-1	BELOW CELLAR FLOOR SLAB	SSD SYSTEM	BULKHEAD	CMV 200	7.87 IN OD INLET/OUTLET	200	6	60 HZ	3 PHASE	230 OR 460 VOLT	725 RPM	INDUSTRIAL PLASTICS/CMV 200

GENERAL NOTES:

1. DRAWING SHALL NOT BE USED FOR STRUCTURAL, ARCHITECTURAL, UTILITY, OR OTHER REFERENCE EXCEPT FOR THE SUB-SLAB DEPRESSURIZATION SYSTEM.

2. DESIGN DETAILS AND DRAWINGS ARE ADAPTED FROM EPA DOCUMENT EPA/625/R-92/016.

3. SYSTEM INSTALLATION SHALL ADHERE TO: OCTOBER 2006 FINAL GUIDANCE FOR EVALUATING SOIL VAPOR INTRUSION IN THE STATE OF NEW YORK, PREPARED BY NEW YORK STATE DEPARTMENT OF HEALTH (NYSDOH), ALL APPLICABLE PORTIONS OF THE BUILDING CODE OF THE CITY OF NEW YORK, INCLUDING BUT NOT LIMITED TO, 2008 NEW YORK CITY MECHANICAL CODE, CHAPTER 5, SECTION MC 512-SUBSLAB EXHAUST SYSTEMS. AS SUCH, POINT OF EXHAUST SHALL BE:
- AT LEAST 12 INCHES ABOVE ROOF.
- AT LEAST 25 FEET FROM ANY ADJOINING OR ADJACENT BUILDINGS, OPERABLE WINDOWS, HVAC INTAKES, SUPPLY REGISTERS, OR ANY OTHER AIR INLETS.

4. EXHAUST STACKS SHALL BE SECURELY ANCHORED WITH ADEQUATE STRUCTURAL SUPPORTS AS SHOWN ON DETAILS.

5. VENT AND RISER PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE NEW YORK CITY PLUMBING CODE, INCLUDING, BUT NOT LIMITED TO, THOSE REQUIREMENTS PERTAINING TO:
- PROTECTION OF SYSTEM COMPONENTS.
- TRENCHING, EXCAVATION, AND BACKFILL.
- STRUCTURAL SAFETY.
- PIPING SUPPORT.
- JOINTS.

6. UNLESS OTHERWISE SPECIFIED, ALL VENT AND RISER PIPING SHALL BE CONSTRUCTED OF 6-INCH SCHEDULE 40 GALVANIZED STEEL PIPE.

7. GAS PERMEABLE AGGREGATE LAYER REQUIREMENTS

ASTM #5 AGGREGATE GRADATION
(FOR PIPE TRENCHES)

SIEVE SIZE	PERCENT FINER BY MASS
1.5-inch	100
1-inch	90 to 100
3/4-inch	20 to 55
1/2-inch	0 to 10
3/8-inch	0 to 5

BLOWER NOTES:

1. THE SUCTION FAN SCHEMATICS ARE SHOWN TO ILLUSTRATE THE REQUIRED COMPONENTS AND THE GENERAL LOCATIONS IN THE PIPING RUN AND SHALL NOT BE CONSIDERED TO BE ACCURATE. THE ACTUAL CONFIGURATION AND DIMENSIONS OF THE SUCTION FAN ASSEMBLY WILL VARY BASED ON MANUFACTURING METHODS AND FIELD CONDITIONS. FINAL DESIGN AND SUCTION FAN SYSTEM SELECTED ARE SUBJECT TO APPROVAL BY THE OWNER. CONTRACTOR SHALL PROVIDE ALL SUCTION FAN SPECIFICATIONS AND CUT SHEETS FOR APPROVAL PRIOR TO INSTALLATION.

2. A DIFFERENTIAL PRESSURE SWITCH SHALL BE INSTALLED ON THE RISER PIPE BEFORE THE SUCTION FAN. THE DIFFERENTIAL PRESSURE SWITCH SHALL BE CONNECTED TO THE BMS (BUILDING MANAGEMENT SYSTEM) IN ACCORDANCE WITH SPECIFICATION SECTION 13284.

3. SUCTION FAN MOTOR WILL REQUIRE A THREE-PHASE, 60HZ, 230 OR 460 VOLT POWER SUPPLY. THE CONTROL PANEL FOR THE SUCTION FAN WILL REQUIRE A ONE PHASE, 60 HZ, 115 VOLT POWER SUPPLY. THE REMOTE VISUAL ALARM WILL REQUIRE A ONE PHASE, 115 VOLT POWER SUPPLY FROM THE BUILDING'S ELECTRICAL SYSTEM. THE ELECTRICAL SERVICE TO THE BLOWER MOTOR IS SHOWN ON THE ELECTRICAL DRAWINGS. COORDINATE POWER SUPPLIES WITH BUILDING POWER FLOOR PLAN. COORDINATE POWER SUPPLY FOR FLOW METER AT THE MANIFOLD LEG THROUGH FLOOR SLAB.

4. CONTRACTOR TO PROVIDE CONNECTION TO GROUNDING FOR ROOFTOP FANS.

5. CONTRACTOR TO PROVIDE SPARE SUCTION FAN AND PARTS.

6. REFER TO SPECIFICATION SECTION 13284 - SUB-SLAB DEPRESSURIZATION SYSTEM ACCESSORIES FOR REQUIREMENTS RELATING TO SUB-SLAB DEPRESSURIZATION SYSTEM ACCESSORIES.

7. ALL HORIZONTAL PIPE RUNS MUST BE PITCHED A MINIMUM OF 1/8-INCH VERTICAL PER FOOT HORIZONTAL (1% SLOPE) TOWARDS EACH SECTION OF SLOTTED VENTING PIPE OR TO CONDENSATE DRAIN WITHIN THE SUB-SLAB WHEN PIPING CAN NOT BE SLOPED TOWARDS SLOTTED PIPES. THE SYSTEM SHALL BE INSTALLED SUCH THAT NO PORTION WILL ALLOW EXCESS ACCUMULATION OF CONDENSATION.

8. ALL CONNECTIONS AT PIPE FITTINGS AND JOINTS SHALL BE LEAK FREE. THIS SHALL BE DEMONSTRATED BY THE PERFORMANCE OF A POSITIVE 5 POUNDS PER SQUARE INCH (PSI) (MIN.) PRESSURE TEST AND SMOKE TEST FOLLOWING PIPE/FITTINGS ASSEMBLY BY THE CONTRACTOR.

9. RISER PIPE SHALL BE PERMANENTLY IDENTIFIED WITHIN EACH FLOOR LEVEL. BACKGROUND SHALL BE SAFETY BLUE WITH WHITE LETTERING. LETTERING SHALL READ:

"CAUTION: DO NOT ALTER.
SUBSURFACE VAPOR VENT PIPE."

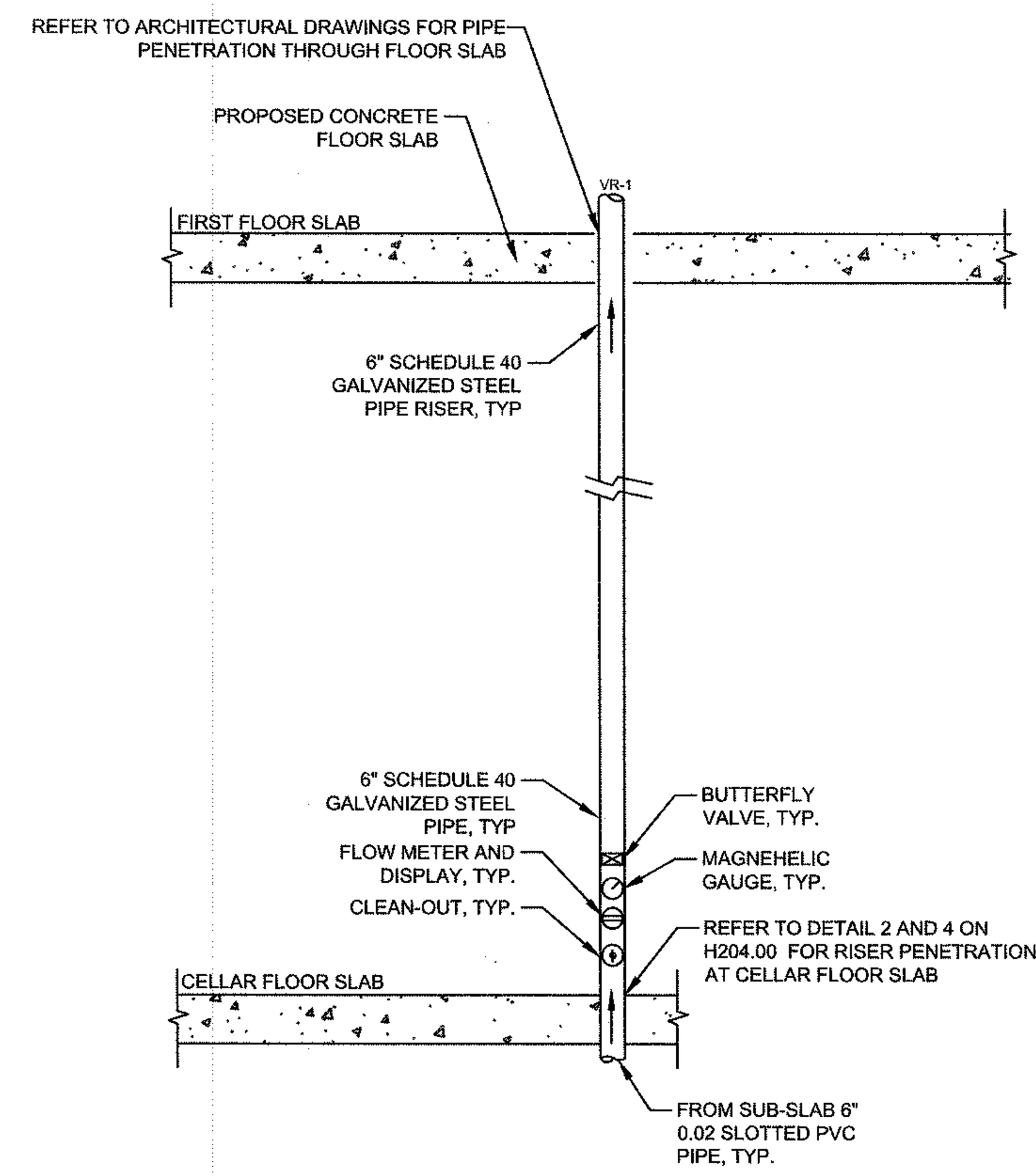
10. ALL EXTERNAL PIPES OR PIPES EXPOSED TO MOISTURE AND METAL SYSTEM COMPONENTS SHALL BE PAINTED WITH A CORROSION RESISTANT COATING.

11. INSTALLATION OF THE SUB-SLAB COMPONENTS AND VENT AND RISER PIPING, FANS AND ROOF PENETRATIONS MUST BE COORDINATED WITH OTHER TRADES FOR THE INSTALLATION OF OTHER UTILITIES AND STRUCTURAL COMPONENTS.

12. RISER PIPE FROM SUB-SLAB TO ROOF SHALL BE COORDINATED WITH ARCHITECT AND MECHANICAL ENGINEER. RISER PIPE SHALL BE EXTENDED TO THE ROOF WITH MINIMAL CHANGES IN DIRECTION. SEE H202.00 AND H203.00 FOR RISER LOCATIONS AND PROPOSED OFF-SETS.

13. REFER TO SPECIFICATION SECTION 13284 - SUB-SLAB DEPRESSURIZATION SYSTEM FOR REQUIREMENTS RELATING TO THE SUB-SLAB DEPRESSURIZATION SYSTEM.

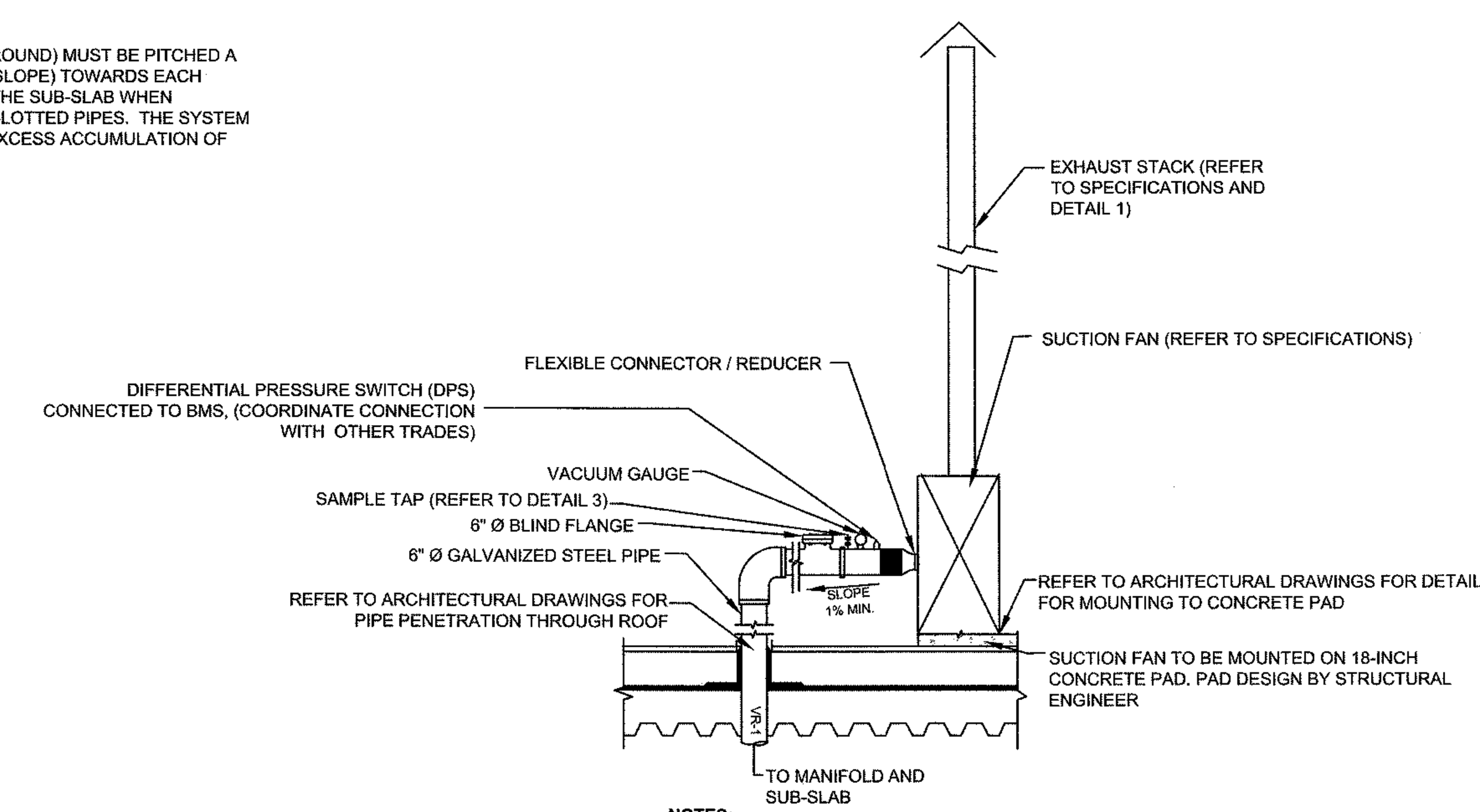
14. CONTRACTOR TO SUBMIT SHOP DRAWINGS OF ALL EQUIPMENT, PIPING, MONITORING POINT LOCATIONS FOR APPROVAL.



NOTES:

1. NOT ALL FITTINGS SHOWN. CONTRACTOR SHALL SUBMIT TO SCALE SKETCH SHOWING PROPOSED PIPE JOINT LOCATIONS. ENGINEER'S APPROVAL OF PIPE JOINT LOCATIONS SHALL BE REQUIRED PRIOR TO CONSTRUCTION.
2. FURNISH ESCUTCHEONS AS SPECIFIED.
3. FURNISH PIPE HANGERS AND WALL MOUNTS AS SPECIFIED IN PLUMBING AND HVAC SPECIFICATIONS AND DRAWINGS.
4. ALL HORIZONTAL PIPE RUNS (ABOVE GROUND AND UNDERGROUND) MUST BE PITCHED A MINIMUM OF 1/8-INCH VERTICAL PER FOOT HORIZONTAL (1% SLOPE) TOWARDS EACH SLOTTED VENTING PIPE OR TO CONDENSATE DRAIN WITHIN THE SUB-SLAB WHEN UNDERGROUND PIPING CANNOT BE SLOPED TOWARDS THE SLOTTED PIPES. THE SYSTEM SHALL BE INSTALLED SUCH THAT NO PORTION WILL ALLOW EXCESS ACCUMULATION OF CONDENSATION.

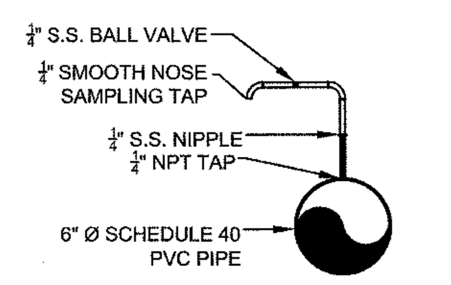
PIPING RISER DIAGRAM (3)
N.T.S.



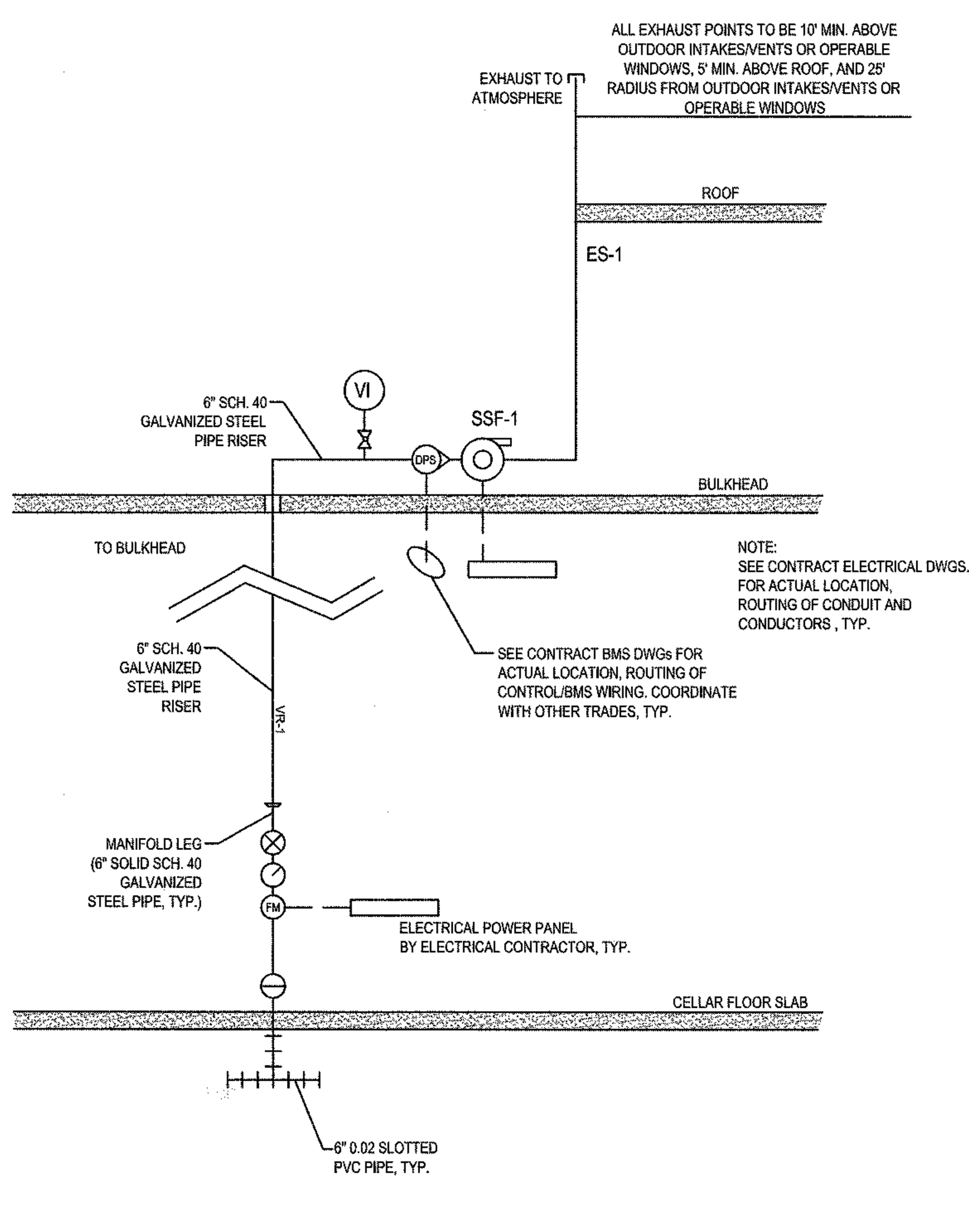
NOTES:

1. NOT ALL REQUIRED ACCESSORIES ARE SHOWN. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. ELECTRICAL WIRING AND EQUIPMENT NOT SHOWN. REFER TO ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR REQUIREMENTS.
3. PIPE AND EQUIPMENT ARRANGEMENT SHOWN FOR SCHEMATIC PURPOSES ONLY. SUBMIT TO SCALE DRAWING SHOWING PROPOSED ARRANGEMENT. CONTRACTOR IS REQUIRED TO OBTAIN APPROVAL OF ARRANGEMENT.
4. COORDINATE ALL ROOF PENETRATIONS WITH ALL OTHER TRADES TO ENSURE ALL PENETRATIONS ARE SEALED IN ACCORDANCE WITH WARRANTY.
5. DIFFERENTIAL PRESSURE SWITCH CONNECTED TO BMS.
6. PROVIDE SHOP DRAWINGS FOR BLOWER AND ACCESSORY LAYOUT.

TYPICAL SUCTION FAN CONNECTION DETAIL (4)
N.T.S.



SAMPLE TAP ASSEMBLY (6)
N.T.S.



SSDS CROSS SECTION (5)
N.T.S.

LEGEND:

- PIPE
- ELECTRICAL CONDUIT
- SLOTTED PIPE
- (VI) VACUUM INDICATOR
- FAN
- (DPS) DIFFERENTIAL PRESSURE SWITCH
- REDUCER
- BALL VALVE (NORMALLY CLOSED)
- (FM) FLOW METER
- RAIN CAP
- BUTTERFLY VALVE
- CLEANOUT
- MAGNEHELIC GAUGE
- ES-1 EXHAUST STACK
- VR-1 VERTICAL RISER

Consultants:

AKRF

AKRF ENGINEERING, P.C.
440 Park Avenue South, New York, NY 10016
(T) 212-696-0670

SSDS

Prepared For:
Bleeker Street Gardens, LLC.
708 Sharrotts Road
Staten Island, NY 10309

DRAFT

No.	Date	Revision

Discipline Lead:	M. GODICK
Designer:	D. SHAPIRO
Drawn by:	S. KENNEY
Checked by:	M. LAPIN, PE
AKRF PROJECT NUMBER: 11686	Date: 08/15/2013

Project:
1041-1047 FULTON STREET
BROOKLYN, NY 11238

Drawing Title:
SUB-SLAB DEPRESSURIZATION SYSTEM BLOWER DETAILS AND EQUIPMENT SCHEDULE

STATE OF NEW YORK · MICHELLE LAPIN · LICENSED PROFESSIONAL ENGINEER · No. 073934-1

Drawing No.: H205.00

Sheets in Contract Set: 5 of 5

Sheets in DOB Set: of