BRINKERHOFF
ENVIRONMENTAL SERVICES, INC.

1805 Atlantic Avenue
Manasquan, New Jersey 08736
Tel: (732) 223-2225
Fax: (732) 223-3666
www.brinkenv.com

April 8, 2013

VIA EMAIL ONLY

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: 13CVCP100X
899 Westchester Avenue
Remedial Action Work Plan (RAWP) Stipulation List

Dear Mr. Chawla:

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

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

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

3. A pre-approval letter from all disposal facilities will be provided to OER prior to any soil/fill material removal from the site. Documentation specified in the RAWP - Appendix 3 - Section 1.6 "Materials Disposal Off-Site" will be provided to OER. If a different disposal facility for the soil/fill material is selected, OER will be notified immediately.

4. A CD containing the final RAWP including this approved Stipulation List will be placed in the library that constitutes the primary public repository for project documents.

5. Signage for the project will include a sturdy placard mounted in a publically accessible right of way to building and other permits signage will consist of the NYC VCP Information Sheet (attached **Appendix 2**) announcing the remedial action. The Information sheet will be laminated and permanently affixed to the placard.

6. In the event that hazardous waste is identified during the remedial action or subsequent redevelopment excavation activities at this NYC VCP project, and removal and transportation of hazardous waste becomes necessary, the project may be subject to the New York State Department of Environmental Conservation's Special Assessment Tax (ECL 27-0923) and Hazardous Waste Regulatory Fees (ECL 72-00402). See DEC's website for more information: http://www.dec.ny.gov/chemical/9099.html.

7. An engineered composite site cover will be placed over the entire footprint of the Site. The composite cover system will be comprised of concrete covered sidewalks, 4" to 6" concrete building slab. A 4'' to 6" concrete slab with rubber pavers will cover the second floor recreation area. PE/RA certified drawings of the composite site cover are provided as **Appendix 3**. Sheets A1.2 and A1.3 in **Appendix 3** shows the typical design for the remedial cover type to be used on this site and the location of each cover type to be built at the site, respectively.

8. The moisture barrier planned for this project is 20 mil HDPE as manufactured by Raven, (or equivalent) to be installed beneath the structure's slab and along the foundation sidewalls. The manufacturer specifications are attached as **Addendum 4**.

9. The Truck route is: east on East 163rd Street, right on Hunts Point Road to the Bruckner Expressway North. North on the Bruckner Expressway to the Cross Bronx Expressway west over the George Washington Bridge into New Jersey. The New Jersey Turnpike to destination.

10. If Track 1 SCOs are achieved then no ICs is required.

11. OER requires parties seeking City Brownfield Incentive Grants (BIG) 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 and a contractor's pollution liability (CPL) policy, both of which must provide $1 million per claim in coverage. Both policies must name the City of New York, the NYC Economic Development Corporation, and Brownfield Redevelopment Solutions as additional insured. A fact sheet regarding insurance is attached as **Appendix 5**.

Sincerely,

DOUG HARM, P.G.
Vice President of Technical Services
Appendices (5)
Cc: W. Wong, NYCOER, via email only, w/appendices

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

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

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

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

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

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 Draft DER-10 as follows:

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

Final excavation depth, length, and width will be determined in the field, and will depend on the horizontal and vertical extent of contaminated soils as indentified through physical examination (PID response, odor, staining, etc.). Collection of verification samples will be performed to evaluate the success of the removal action as specified in this document.

The following procedure will be used for the excavation of impacted soil (as necessary and appropriate):

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

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

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

Appendix 2
NYC VCP Signage

NYC Voluntary Cleanup Program

899 Westchester Avenue
Site #: 13CVCP100X

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.

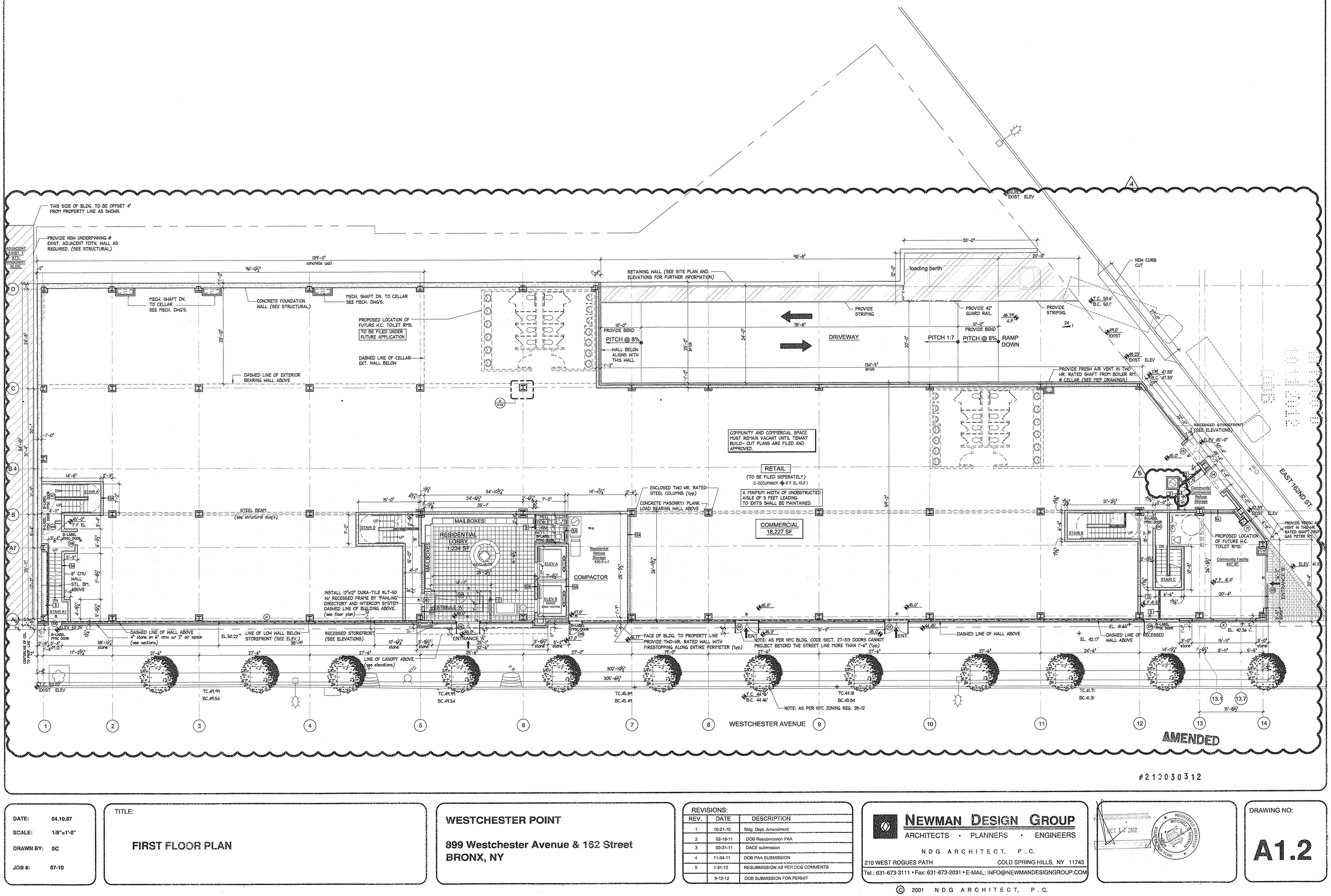
Or scan with smart phone:

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) 442-3007
or email us at brownfields@cityhall.nyc.gov

Appendix 3
Composite Site Cover Design and Location



DATE:	04.10.07
SCALE:	1/8"=1'-0"
DRAWN BY:	SC
JOB #:	07-10

TITLE:

FIRST FLOOR PLAN

WESTCHESTER POINT

899 Westchester Avenue & 162 Street
BRONX, NY

REVISIONS:

REV.	DATE	DESCRIPTION
1	10-21-10	Bldg. Dept. Amendment
2	02-18-11	DOB Resubmission PAA
3	03-31-11	DACE submission
4	11-04-11	DOB PAA SUBMISSION
5	1-31-12	RESUBMISSION AS PER DOB COMMENTS
	9-12-12	DOB SUBMISSION FOR PERMIT

NEWMAN DESIGN GROUP
ARCHITECTS • PLANNERS • ENGINEERS
NDG ARCHITECT, P.C.
210 WEST ROGUES PATH COLD SPRING HILLS, NY 11743
Tel.: 631-673-3111 • Fax: 631-673-2031 • E-MAIL: INFO@NEWMANDESIGNGROUP.COM

DRAWING NO:

A1.2

APPROVED
11/26/2012
DOB

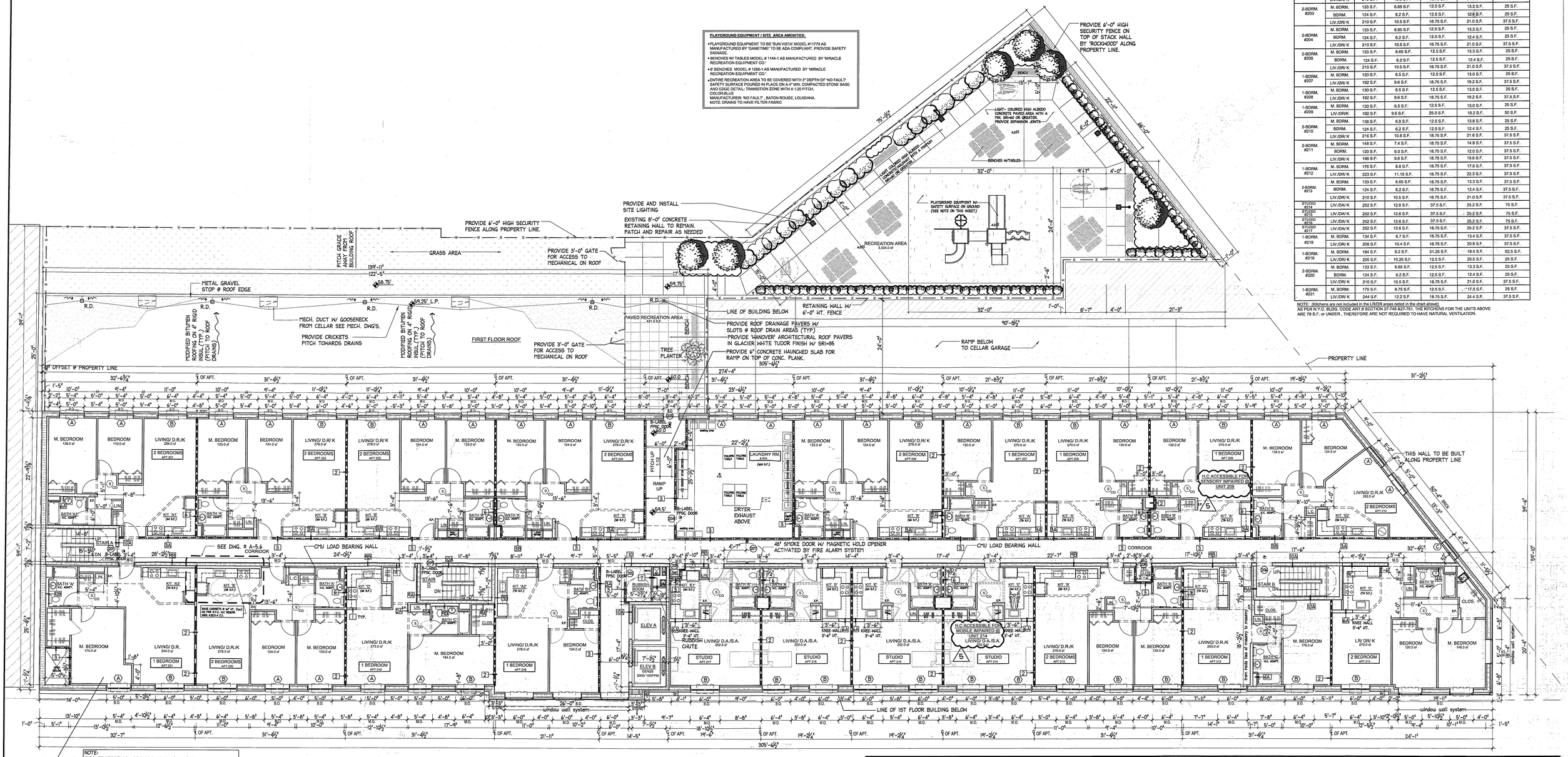
PLAYGROUND EQUIPMENT / SITE AREA AMENITIES:

- PLAYGROUND EQUIPMENT TO BE 'SUN VISTA' MODEL #11779 AS MANUFACTURED BY 'GAMETIME' TO BE ADA COMPLIANT. PROVIDE SAFETY SIGNAGE.
- BENCHES W/ TABLES MODEL # 1144-1 AS MANUFACTURED BY 'MIRACLE RECREATION EQUIPMENT CO.'
- 6' BENCHES MODEL # 1295-1 AS MANUFACTURED BY 'MIRACLE RECREATION EQUIPMENT CO.'
- ENTIRE RECREATION AREA TO BE COVERED WITH 3" DEPTH OF 'NO FAULT' SAFETY SURFACE POURED IN PLACE ON A 4" MIN. COMPACTED STONE BASE AND EDGE DETAIL: TRANSITION ZONE WITH A 1:20 PITCH. COLOR: BLUE
  MANUFACTURER: NO FAULT, BATON ROUGE, LOUISIANA.
  NOTE: DRAINS TO HAVE FILTER FABRIC

LIGHT AND VENTILATION REQUIREMENTS TABLE PER SUBCHAPTER 12, ARTICLES 3&6

TYP. APT.	ROOM NAME	FLOOR AREA	VENT. REQ'D 5%	VENT. PROVIDED	LIGHT REQ'D 10%	LIGHT PROVIDED
2-BDRM. #201	M. BDRM.	138 S.F.	6.9 S.F.	12.5 S.F.	13.8 S.F.	25 S.F.
	BDRM.	110 S.F.	5.5 S.F.	12.5 S.F.	11.0 S.F.	25 S.F.
	LIV./DR/ K	220 S.F.	11.0 S.F.	18.75 S.F.	22.0 S.F.	37.5 S.F.
2-BDRM. #202	M. BDRM.	133 S.F.	6.65 S.F.	12.5 S.F.	13.3 S.F.	25 S.F.
	BDRM.	124 S.F.	6.2 S.F.	12.5 S.F.	12.4 S.F.	25 S.F.
	LIV./DR/ K	210 S.F.	10.5 S.F.	18.75 S.F.	21.0 S.F.	37.5 S.F.
2-BDRM. #203	M. BDRM.	133 S.F.	6.65 S.F.	12.5 S.F.	13.3 S.F.	25 S.F.
	BDRM.	124 S.F.	6.2 S.F.	12.5 S.F.	12.4 S.F.	25 S.F.
	LIV./DR/ K	210 S.F.	10.5 S.F.	18.75 S.F.	21.0 S.F.	37.5 S.F.
2-BDRM. #204	M. BDRM.	133 S.F.	6.65 S.F.	12.5 S.F.	13.3 S.F.	25 S.F.
	BDRM.	124 S.F.	6.2 S.F.	12.5 S.F.	12.4 S.F.	25 S.F.
	LIV./DR/ K	210 S.F.	10.5 S.F.	18.75 S.F.	21.0 S.F.	37.5 S.F.
2-BDRM. #205	M. BDRM.	133 S.F.	6.65 S.F.	12.5 S.F.	13.3 S.F.	25 S.F.
	BDRM.	124 S.F.	6.2 S.F.	12.5 S.F.	12.4 S.F.	25 S.F.
	LIV./DR/ K	210 S.F.	10.5 S.F.	18.75 S.F.	21.0 S.F.	37.5 S.F.
1-BDRM. #207	M. BDRM.	130 S.F.	6.5 S.F.	12.5 S.F.	13.0 S.F.	25 S.F.
	LIV./DR/ K	192 S.F.	9.6 S.F.	18.75 S.F.	19.2 S.F.	37.5 S.F.
1-BDRM. #208	M. BDRM.	130 S.F.	6.5 S.F.	12.5 S.F.	13.0 S.F.	25 S.F.
	LIV./DR/ K	192 S.F.	9.6 S.F.	18.75 S.F.	19.2 S.F.	37.5 S.F.
1-BDRM. #209	M. BDRM.	130 S.F.	6.5 S.F.	12.5 S.F.	13.0 S.F.	25 S.F.
	LIV./DR/K	192 S.F.	9.6 S.F.	25.0 S.F.	19.2 S.F.	50 S.F.
2-BDRM. #210	M. BDRM.	138 S.F.	6.9 S.F.	12.5 S.F.	13.8 S.F.	25 S.F.
	BDRM.	124 S.F.	6.2 S.F.	12.5 S.F.	12.4 S.F.	25 S.F.
	LIV./DR/ K	216 S.F.	10.8 S.F.	18.75 S.F.	21.6 S.F.	37.5 S.F.
2-BDRM. #211	M. BDRM.	148 S.F.	7.4 S.F.	18.75 S.F.	14.8 S.F.	37.5 S.F.
	BDRM.	120 S.F.	6.0 S.F.	18.75 S.F.	12.0 S.F.	37.5 S.F.
	LIV./DR/ K	196 S.F.	9.8 S.F.	18.75 S.F.	19.6 S.F.	37.5 S.F.
1-BDRM. #212	M. BDRM.	176 S.F.	8.8 S.F.	18.75 S.F.	17.6 S.F.	37.5 S.F.
	LIV./DR/ K	223 S.F.	11.15 S.F.	18.75 S.F.	22.3 S.F.	37.5 S.F.
2-BDRM. #213	M. BDRM.	133 S.F.	6.65 S.F.	18.75 S.F.	13.3 S.F.	37.5 S.F.
	BDRM.	124 S.F.	6.2 S.F.	18.75 S.F.	12.4 S.F.	37.5 S.F.
	LIV./DR/ K	210 S.F.	10.5 S.F.	18.75 S.F.	21.0 S.F.	37.5 S.F.
STUDIO #214	LIV./DA/ K	252 S.F.	12.6 S.F.	37.5 S.F.	25.2 S.F.	75 S.F.
STUDIO #215	LIV./DA/ K	252 S.F.	12.6 S.F.	37.5 S.F.	25.2 S.F.	75 S.F.
STUDIO #216	LIV./DA/ K	252 S.F.	12.6 S.F.	37.5 S.F.	25.2 S.F.	75 S.F.
STUDIO #217	LIV./DA/ K	252 S.F.	12.6 S.F.	18.75 S.F.	25.2 S.F.	37.5 S.F.
1-BDRM. #218	M. BDRM.	134 S.F.	6.7 S.F.	18.75 S.F.	13.4 S.F.	37.5 S.F.
	LIV./DR/ K	208 S.F.	10.4 S.F.	18.75 S.F.	20.8 S.F.	37.5 S.F.
1-BDRM. #219	M. BDRM.	184 S.F.	9.2 S.F.	31.25 S.F.	18.4 S.F.	62.5 S.F.
	LIV./DR/ K	205 S.F.	10.25 S.F.	12.5 S.F.	20.5 S.F.	25 S.F.
2-BDRM. #220	M. BDRM.	133 S.F.	6.65 S.F.	12.5 S.F.	13.3 S.F.	25 S.F.
	BDRM.	124 S.F.	6.2 S.F.	12.5 S.F.	12.4 S.F.	25 S.F.
	LIV./DR/ K	210 S.F.	10.5 S.F.	18.75 S.F.	21.0 S.F.	37.5 S.F.
1-BDRM. #221	M. BDRM.	175 S.F.	8.75 S.F.	12.5 S.F.	17.5 S.F.	25 S.F.
	LIV./DR/ K	244 S.F.	12.2 S.F.	18.75 S.F.	24.4 S.F.	37.5 S.F.

NOTE: (Kitchens are not included in the LR/DR areas noted in the chart above).
AS PER N.Y.C. BLDG. CODE ART.8 SECTION 27-748 &27-751, THE KITCHENS FOR THE UNITS ABOVE ARE 79 S.F. or UNDER , THEREFORE ARE NOT REQUIRED TO HAVE NATURAL VENTILATION.



NOTE:
FIRE PROTECTION- PROVIDE CARBON MONOXIDE DETECTORS AND SMOKE DETECTORS AS SHOWN ON MECH. DWG'S.

GENERAL NOTES

THE PROJECT SHOULD HAVE APPLIANCES/ ACCESSORIES AVAILABLE TO BE INSTALLED AND SHOULD BE ABLE TO PROVIDE TO TENANTS AND PROSPECTIVE TENANTS, INFORMATION ON THE AVAILABLE ACCOMMODATIONS.

REQUIREMENTS FOR PEOPLE WITH VISUAL IMPAIRMENTS:

1. ANY LIGHTING FIXTURES PROVIDED IN THE UNIT SHOULD BE EQUIPPED WITH RECEPTACLES CAPABLE OF HANDLING 150-WATT BULBS.
2. COOK TOPS CONTROLS SHOULD BE MOUNTED ON THE FRONT OR SIDE OF THE RANGE AND CONTROLS WITH TACTILE MARKINGS SHOULD BE AVAILABLE FOR INSTALLATION IF REQUIRED BY THE TENANTS.

REQUIREMENTS FOR HANDICAPPED PEOPLE:

1. RANGES AND COOKTOPS. THE LOCATION OF CONTROLS FOR RANGES AND COOK-TOPS SHALL REQUIRE NOT REACHING ACROSS BURNERS.
2. OVENS. OVENS SHALL BE OF THE SELF-CLEANING TYPE OR BE LOCATED ADJACENT TO AN ADJUSTABLE HEIGHT COUNTER WITH KNEE SPACE BELOW. OVENS SHALL HAVE CONTROLS ON FRONT PANELS; THEY MAY BE LOCATED ON EITHER SIDE OF THE DOOR.
3. REFRIGERATOR/FREEZER. PROVISION SHALL BE MADE FOR REFRIGERATORS WHICH ARE:
   (1) OF THE VERTICAL SIDE-BY-SIDE REFRIGERATOR/FREEZER TYPE; OR
   (2) OF THE OVER-AND-UNDER TYPE AND MEET THE FOLLOWING REQUIREMENTS:
   (A) HAVE AT LEAST 50 PERCENT OF THE FREEZER SPACE BELOW 54 IN ABOVE THE FLOOR.
   (B) HAVE 100 PERCENT OF THE REFRIGERATOR SPACE AND CONTROLS BELOW 54 IN .
   (C) FREEZERS WITH LESS THAN 100 PERCENT OF THE STORAGE VOLUME BELOW 54IN. SHALL BE THE SELF-DEFROSTING TYPE.
4. KITCHEN STORAGE. CABINETS, DRAWERS, AND SHELF AREAS SHALL HAVE THE FOLLOWING FEATURES:
   (1) MAXIMUM HEIGHT SHALL BE 46 IN. FOR AT LEAST ONE SHELF OF ALL CABINETS AND STORAGE SHELVES MOUNTED ABOVE WORK COUNTERS.
   (2) DOOR PULLS OR HANDLES FOR WALL CABINETS SHALL BE MOUNTED AS CLOSE TO THE BOTTOM OF CABINET DOORS AS POSSIBLE. DOOR PULLS OR HANDLES FOR BASE CABINETS SHALL BE MOUNTED AS CLOSE TO THE TOP OF CABINET DOORS AS POSSIBLE.
5. AT H.C. ACCESSIBLE UNIT FOR MOBILE IMPAIRED DO NOT INSTALL TWO 30" BASE CABINETS (ONE MUST BE AT THE SINK AREA) -SEE PLANS FOR LOCATIONS.
6. AT ALL H.C. ADAPTABLE UNITS PROVIDE TWO FUTURE REMOVABLE CABINETS WITH INSERTS AND FINISHED END PANELS- SEE PLANS.

AMENDED

DATE: 04.10.07
SCALE: 1/8"=1'-0"
DRAWN BY: TA
JOB #: 07-10

TITLE:

SECOND FLOOR PLAN

WESTCHESTER POINT

899 Westchester Avenue & 162 Street
BRONX, NY

REVISIONS:

REV.	DATE	DESCRIPTION
1	10-21-10	Bldg. Dept. Amendment
2	03-31-11	DACE submission
3	11-04-11	DOB PAA SUBMISSION*
4	1-31-12	RESUBMISSION AS PER DOB COMMENTS
	9-12-12	DOB SUBMISSION FOR PERMIT
5	11-09-12	DOB PAA as per HPD

NEWMAN DESIGN GROUP
ARCHITECTS • PLANNERS • ENGINEERS
N D G A R C H I T E C T, P. C.
210 WEST ROGUES PATH COLD SPRING HILLS, NY 11743
Tel.: 631-673-3111 • Fax: 631-673-2031 • E-MAIL: INFO@NEWMANDESIGNGROUP.COM

EXAMINED FOR ZONING, EGRESS AND PRE-SEVEN TOWNLY AS PER DRAWING OF 1975
NOV 27 2012
AKNY:
REGISTERED ARCHITECT RICHARD E. NEWMAN STATE OF NEW YORK

DRAWING NO:
A1.3

DEPT-810005 2100305012 Job Number
SC622922346 Scan Code

Appendix 4
Moisture Barrier Manufacturer Specifications

VAPORBLOCK® PLUS™ VBP20

Under-Slab Vapor / Gas Barrier

RAVEN INDUSTRIES

Product Description

VaporBlock® Plus™ 20 is a seven-layer co-extruded barrier made from state-of-the-art polyethylene and EVOH resins to provide unmatched impact strength as well as superior resistance to gas and moisture transmission. VaporBlock® Plus™ 20 is a highly resilient underslab / vertical wall barrier designed to restrict naturally occurring gases such as radon and/or methane from migrating through the ground and concrete slab. VaporBlock® Plus™ 20 is more than 100 times less permeable than typical high-performance polyethylene vapor retarders against Methane, Radon and other harmful VOCs.

VaporBlock® Plus™ 20 is one of the most effective underslab gas barriers in the building industry today far exceeding ASTM E-1745 (Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs) Class A, B and C requirements. Available in a 20 (Class A) mil thicknesses designed to meet the most stringent requirements. VaporBlock® Plus™ 20 is produced within the strict guidelines of our ISO 9001:2008 Certified Management System.

Product Use

VaporBlock® Plus™ 20 resists gas and moisture migration into the building envelop when properly installed to provide protection from toxic/harmful chemicals. It can be installed as part of a passive or active control system extending across the entire building including floors, walls and crawl spaces. When installed as a passive system it is recommended to also include a ventilated system with sump(s) that could be converted to an active control system with properly designed ventilation fans.

VaporBlock® Plus™ 20 works to protect your flooring and other moisture-sensitive furnishings in the building's interior from moisture and water vapor migration, greatly reducing condensation, mold and degradation.

Size & Packaging

VaporBlock® Plus™ 20 is available in 10' x 150' rolls to maximize coverage. All rolls are folded on heavy-duty cores for ease in handling and installation. Other custom sizes with factory welded seams are available based on minimum volume requirements. Installation instructions and ASTM E-1745 classifications accompany each roll.

Under-Slab Vapor/Gas Retarder

Product	Part #
VaporBlock Plus 20	VBP 20

APPLICATIONS

- Radon Barrier
- Methane Barrier
- VOC Barrier
- Under-Slab Vapor Retarder
- Foundation Wall Vapor Retarder

VaporBlock® Plus™
UNDERSLAB VAPOR RETARDER / GAS BARRIER

VAPORBLOCK® PLUS™ VBP20

ISO 9001:2008 CERTIFIED MANAGEMENT SYSTEM

Under-Slab Vapor / Gas Barrier

PROPERTIES	TEST METHOD	VAPORBLOCK PLUS 20 IMPERIAL	VAPORBLOCK PLUS 20 METRIC
APPEARANCE		White/Gold	
THICKNESS, NOMINAL		20 mil	0.51 mm
WEIGHT		102 lbs/MSF	498 g/m²
CLASSIFICATION	ASTM E 1745	CLASS A, B & C	
TENSILE STRENGTH LBF/IN (N/CM) AVERAGE MD & TD (NEW MATERIAL)	ASTM E 154 Section 9 (D-882)	58 lbf	102 N
IMPACT RESISTANCE	ASTM D 1709	2600 g	
MAXIMUM USE TEMPERATURE		180° F	82° C
MINIMUM USE TEMPERATURE		-70° F	-57° C
PERMEANCE (NEW MATERIAL)	ASTM E 154 Section 7 ASTM E 96 Procedure B	0.0051 Perms grains/(ft²·hr·in·Hg)	0.0034 Perms g/(24hr·m²·mm Hg)
RADON DIFFUSION COEFFIECIENT	K124/02/95	< 1.1 x 10^{-13} m²/s	
METHANE PERMEANCE	ASTM D 1434	< 1.7 x 10^{-10} m²/d• atm 0.32 GTR (Gas Transmission Rate) ml/m²•D•ATM	

VaporBlock® Plus™ Placement

All instructions on architectural or structural drawings should be reviewed and followed.
Detailed installation instructions accompany each roll of VaporBlock® Plus™ and can also be located on our website.
ASTM E-1643 also provides general installation information for vapor retarders.

VaporBlock® Plus™
UNDERSLAB VAPOR RETARDER / GAS BARRIER

VaporBlock® Plus™ is a seven-layer co-extruded barrier made using high quality virgin-grade polyethylene and EVOH resins to provide unmatched impact strength as well as superior resistance to gas and moisture transmission.

RAVEN INDUSTRIES
Engineered Films Division
P.O. Box 5107
Sioux Falls, SD 57117-5107
Ph: (605) 335-0174 • Fx: (605) 331-0333
Toll Free: 800-635-3456
Email: efdsales@ravenind.com
www.ravenefd.com

Limited Warranty available at www.RavenEFD.com

VaporBlock® Plus™

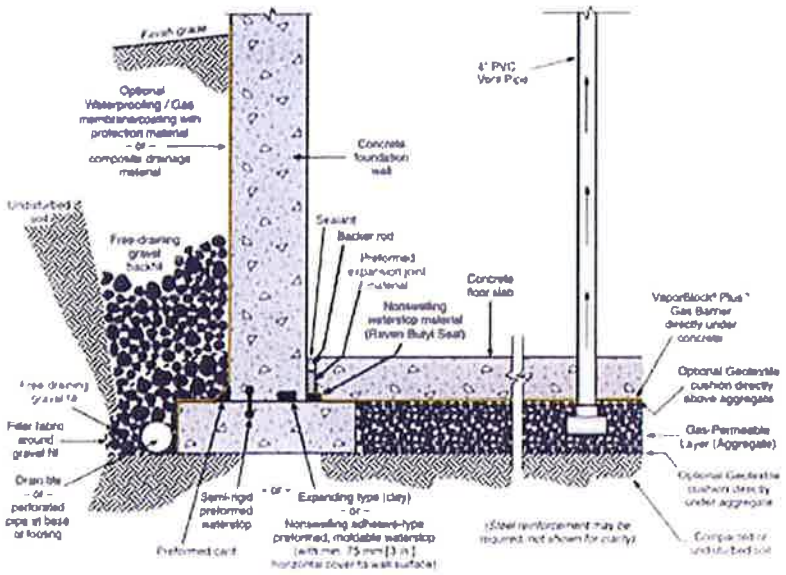
UNDERSLAB VAPOR RETARDER / GAS BARRIER

INSTALLATION GUIDELINES

Please Note: *Read these instructions thoroughly before installation to ensure proper use of* ***VaporBlock® Plus™****. ASTM E 1465, ASTM E 2121 and, ASTM E 1643 also provide valuable information regarding the installation of vapor / gas barriers. When installing this product, contractors shall conform to all applicable local, state and federal regulations and laws pertaining to residential and commercial building construction.*

- **When VaporBlock Plus gas barrier is used as part of an active control system for radon or other gas, a ventilation system will be required.**
- **If designed as a passive system, it is recommended to install a ventilation system that could be converted to an active system if needed.**

Materials List:
VaporBlock® Plus™ Vapor / Gas Barrier
VaporBond Plus 4" Foil Seaming Tape
Butyl Seal 2-Sided Tape
VaporBoot Plus Pipe Boots 12/Box (recommended)
VaporBoot Tape (optional)



Elements of a moisture/gas-resistant floor system. General illustration only.
(Note: This example shows multiple options for waterstop placement.

VAPORBLOCK® PLUS™ PLACEMENT

1.1. Level and tamp or roll granular base as specified. A base for a gas-reduction system may require a 4" to 6" gas permeable layer of clean coarse aggregate as specified by your architectural or structural drawings after installation of the recommended gas collection system. In this situation, a cushion layer consisting of a non-woven geotextile fabric placed directly under **VaporBlock® Plus™** will help protect the barrier from damage due to possible sharp coarse aggregate.

1.2. Unroll **VaporBlock Plus** running the longest dimension parallel with the direction of the pour and pull open all folds to full width. (Fig. 1)

1.3. Lap **VaporBlock Plus** over the footings and seal with Raven Butyl Seal tape at the footing-wall connection. Prime concrete surfaces and assure they are dry and clean prior to applying Raven Butyl Seal Tape. Apply even and firm pressure with a rubber roller. Overlap joints a minimum of 6" and seal overlap with Raven VaporBond Tape. When used as a gas

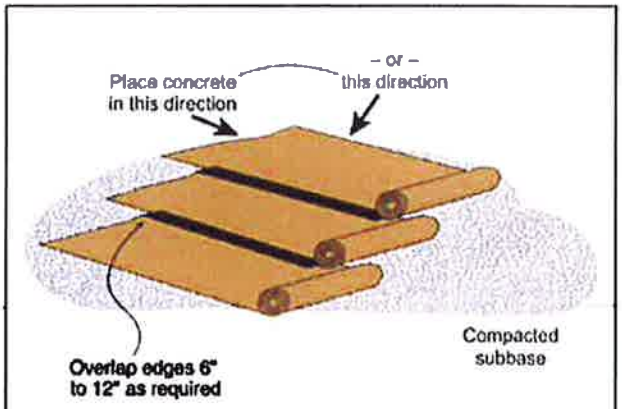


Fig. 1: VaporBlock Plus Overlaping Roll-out Method

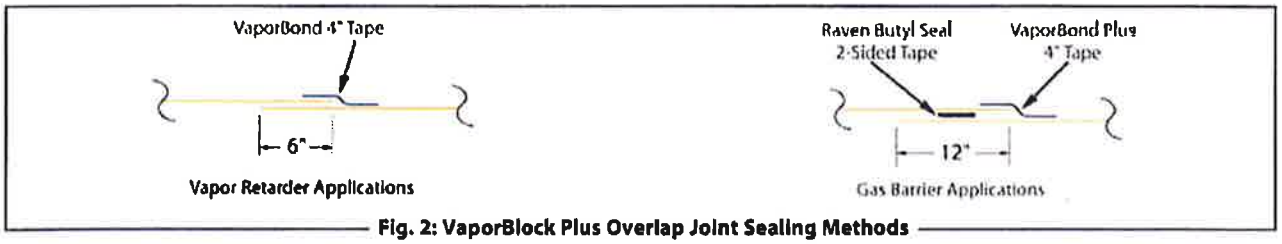


Fig. 2: VaporBlock Plus Overlap Joint Sealing Methods

SINGLE PENETRATION PIPE BOOT INSTALLATION

barrier, overlap joints a minimum of 12" and seal in-between overlap with 2-sided Raven Butyl Seal Tape. Then seal with VaporBond Plus Tape centered on the overlap seam. (Fig. 2)

1.4. Seal around all plumbing, conduit, support columns or other penetrations that come through the **VaporBlock Plus** membrane. Pipes four inches or smaller can be sealed with Raven VaporBoot Plus preformed pipe boots. VaporBoot Plus preformed pipe boots are formed in steps for 1", 2", 3" and 4" PVC pipe or IPS size and are sold in units of 12 per box (Fig. 3 & 5).

Pipe boots may also be fabricated from excess **VaporBlock Plus** membrane (Fig. 4 & 6) and sealed with VaporBoot Tape or VaporBond Plus Tape (sold separately).

Reminder Note: All holes or penetrations through the membrane will need a patch cut to a minimum of 12" from the opening in all directions.

To fabricate pipe boots from **VaporBlock Plus** excess material (see Fig. 4 & 6 for A-F):

A) Cut a square large enough to overlap 12" in all directions.

B) Mark where to cut opening on the center of the square and cut four to eight slices about 3/8" less than the diameter of the pipe.

C) Force the square over the pipe leaving the tightly stretched cut area around the bottom of the pipe with approximately a 1/2" of the boot material running vertically up the pipe. *(no more than a 1/2" of stretched boot material is recommended)*

D) Once boot is positioned, seal the perimeter to the membrane by applying 2-sided Raven Butyl Seal Tape in between the two layers. Secure boot down firmly over the membrane taking care not to have any large folds or creases.

E) Use VaporBoot Tape or VaporBond Plus Tape to secure the boot to the pipe.

VaporBoot Tape (option) – fold tape in half lengthwise, remove half of the release liner and wrap around the pipe allowing 1" extra for overlap sealing. Peel off the second half of the release liner and work the tape outward gradually forming a complete seal.

VaporBond Plus Tape (option) - Tape completely around pipe overlapping the to get a tight seal against the pipe.

F) Complete the process by taping over the boot perimeter edge with VaporBond Plus Tape to create a monolithic membrane between the surface of the slab and gas/ moisture sources below and at the slab perimeter. (Fig. 4 & 6)

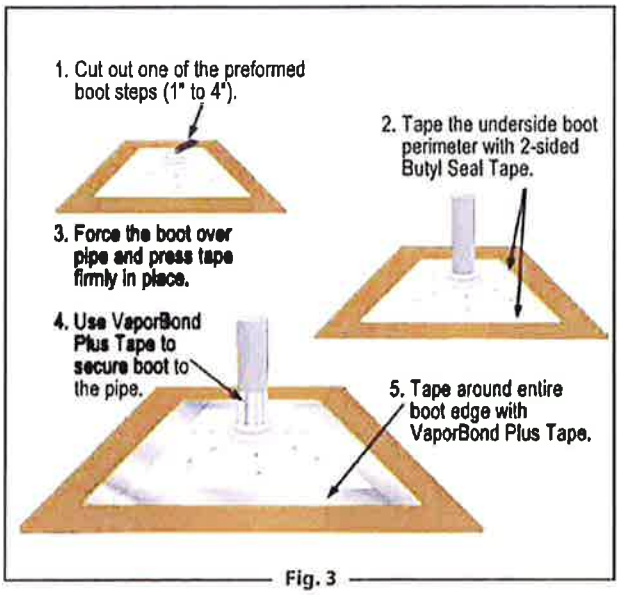


Fig. 3

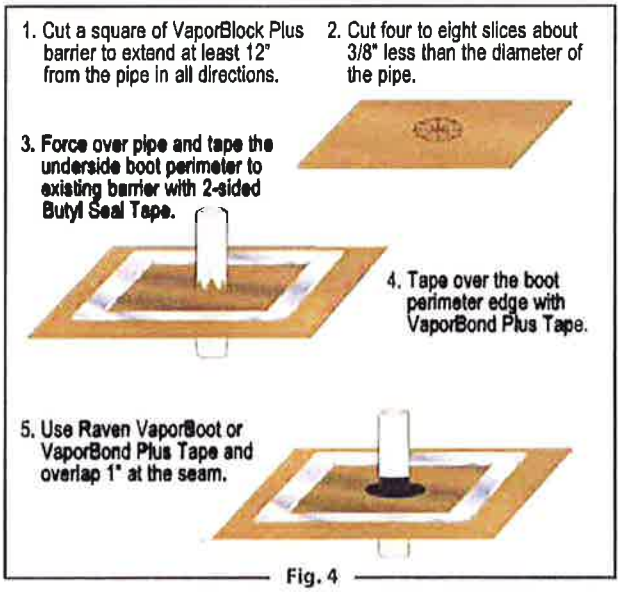


Fig. 4

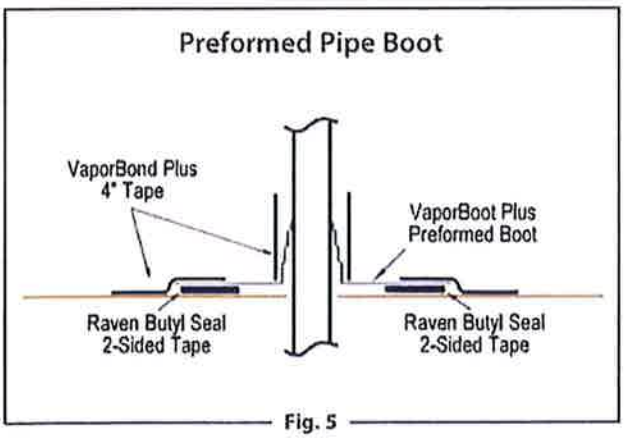


Fig. 5

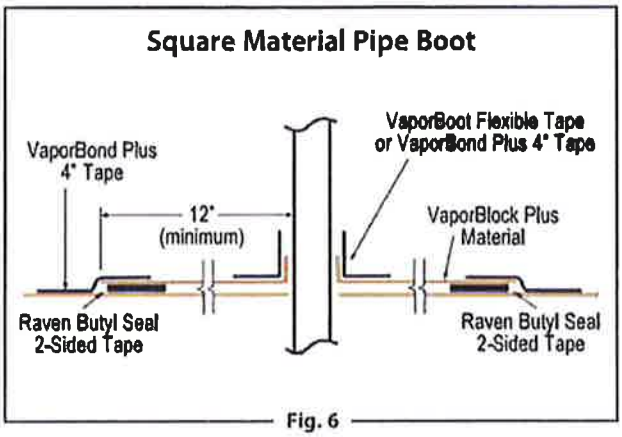


Fig. 6

MULTIPLE PENETRATION PIPE BOOT INSTALLATION

1.5. For side-by-side multiple penetrations;

A) Cut a patch large enough to overlap 12" in all directions (Fig. 7) of penetrations.

B) Mark where to cut openings and cut four to eight slices about 3/8" less than the diameter of the penetration for each.

C) Slide patch material over penetration to achieve a tight fit.

D) Once patch is positioned, seal the perimeter to the membrane by applying 2-sided Raven Butyl Seal Tape in-between the two layers. (Fig. 8)

E) After applying Raven Butyl Seal Tape between the patch and membrane, tape around each of the penetrations and the patch with VaporBond Plus 4" foil tape. (Fig. 9) For additional protection apply an acceptable polyurethane elastomeric sealant around the penetrations. (Fig. 10)

1.6. Holes or openings through **VaporBlock Plus** are to be repaired by cutting a piece of **VaporBlock Plus** 12" larger in all directions from the opening. Seal the patch to the barrier with 2-sided Raven Butyl Seal Tape and seal the edges of the patch with VaporBond Plus Tape.

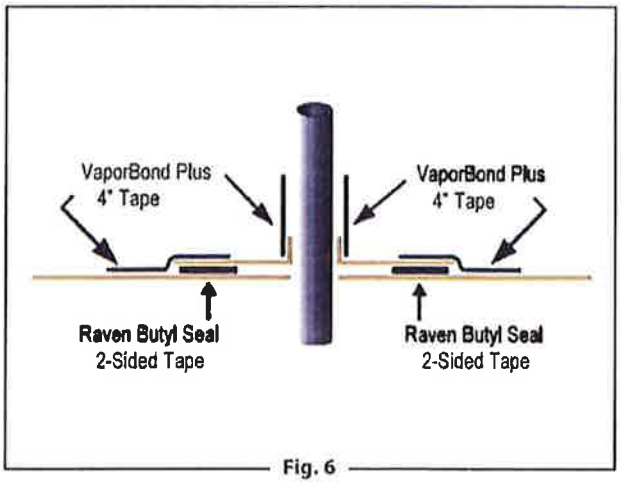


Fig. 6

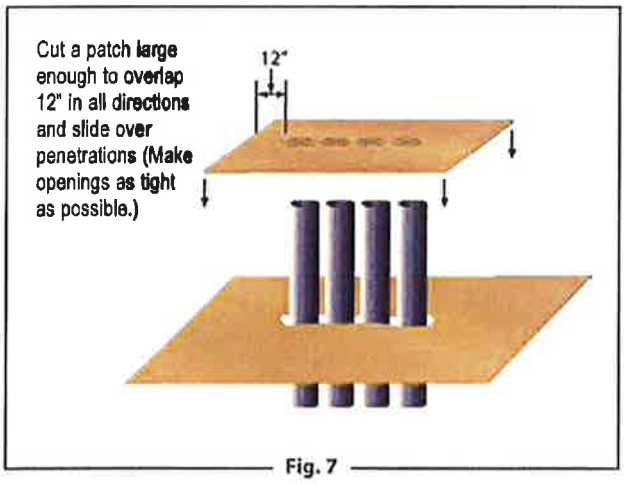


Fig. 7

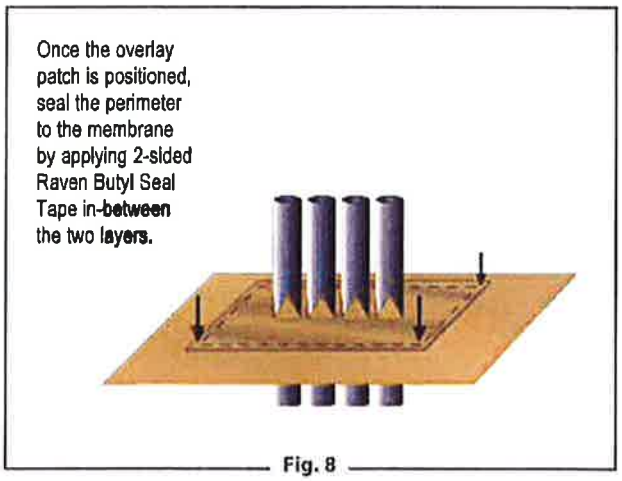


Fig. 8

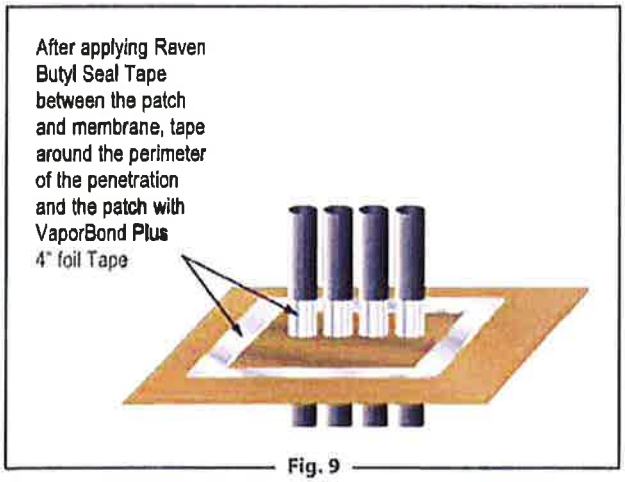


Fig. 9

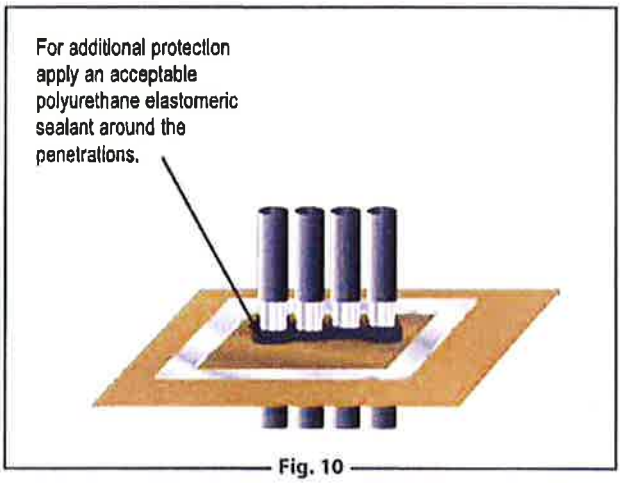


Fig. 10

VAPORBLOCK® PLUS™ PROTECTION

2.1. When installing reinforcing steel and utilities, in addition to the placement of concrete, take precaution to protect **VaporBlock Plus**. Carelessness during installation can damage the most puncture-resistant membrane. Sheets of plywood cushioned with geotextile fabric temporarily placed on **VaporBlock Plus** provide for additional protection in high traffic areas including concrete buggies.

2.2. Use only brick-type or chair-type reinforcing bar supports to protect **VaporBlock Plus** from puncture.

2.3. Avoid driving stakes through **VaporBlock Plus**. If this cannot be avoided, each individual hole must be repaired per section 1.6.

2.4. If a cushion or blotter layer is required in the design between **VaporBlock Plus** and the slab, additional care should be given if sharp crushed rock is used. Washed rock will provide less chance of damage during placement. Care must be taken to protect blotter layer from precipitation before concrete is placed.

Note: To the best of our knowledge, these are typical installation procedures and are intended as guidelines only. Architectural or structural drawings must be reviewed and followed as well on a project basis. NO WARRANTIES ARE MADE AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS OR GUIDELINES REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and we disclaim all liability for resulting loss or damage.

RAVEN INDUSTRIES

RAVEN INDUSTRIES, INC. / Engineered Films Division
P.O. Box 5107 • Sioux Falls, SD 57117-5107
Ph: (605) 335-0174 • Fx: (605) 331-0333
Toll Free: 800-635-3456

ISO 9001:2000 CERTIFIED MANAGEMENT SYSTEM

www.vaporblockplus.com

6/09 EFD 1127

Appendix 5
BIG Program Insurance Fact Sheet

FACT SHEET – BIG PROGRAM INSURANCE REQUIREMENTS

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

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

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

- Its general contractor or excavation/foundation contractor hired to perform remedial work must maintain:

    a. Commercial General Liability(CGL) insurance of at least $1M per occurrence and $2M in the general aggregate; and

    b. Contractors Pollution Liability (CPL) insurance of at least $1M per occurrence.

    Both policies 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 subcontractors who are hired by the general contractor etc. to perform remedial work at a site, including soil brokers and truckers, must also maintain CGL and CPL policies in the amount and with the terms set forth above; and

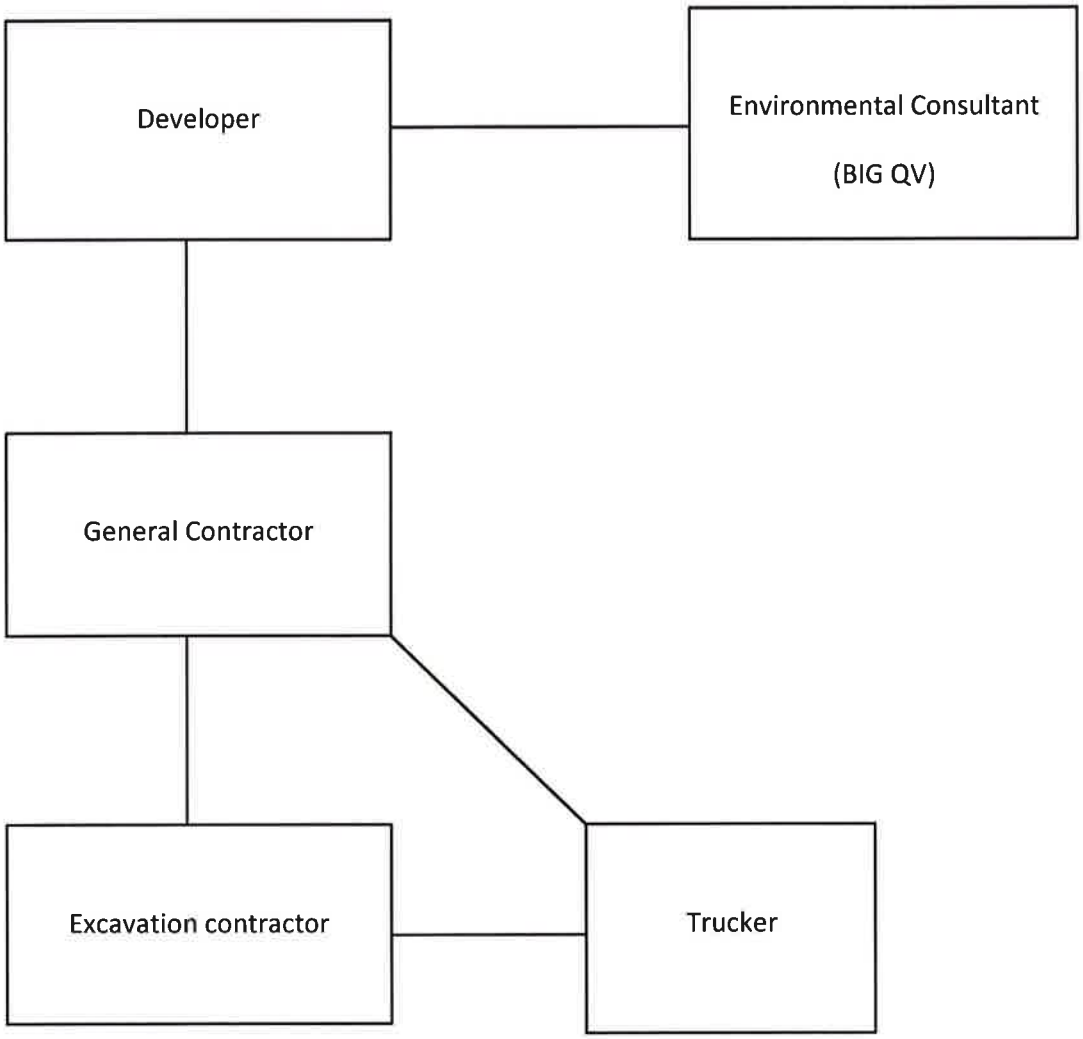
- Its environmental consultant(s) hired to oversee the cleanup must be:
    a. a BIG Qualifed Vendor; and
    b. maintain Professional Liability (PL) insurance of $1M per claim and annual aggregate.

If, in the alternative, the developer hires its environmental consultant to perform the cleanup, the environmental consultant must maintain CGL and CPL insurance in the amount and with the terms set forth 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 and Required CPL Policies 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