

FORMER PFIZER PROPERTY SITE B - OPERABLE UNIT 2

177 HARRISON AVENUE
BROOKLYN NEW YORK
Block 2266 Lots 1 and 52

Site Management Plan

NYSDEC VCP Site No. V00350-2

Prepared for:

Congregation YGS
174 Rodney Street
Brooklyn, New York 11211



AMC Engineering PLLC
1836 42nd Street
Astoria, NY 11105
516-417-8588

Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date
1	5/23/18	Lot 52 was added to the plan.	
2	6/28/18	Revised as requested by DEC	

JUNE 2018

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LIST OF ACRONYMS

Acronym	Definition
AMC	AMC Engineering
AWQS	Ambient Water Quality Standards
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
CQMP	Construction Quality Management Plan
DUSR	Data Usability Statement Report
EBC	Environmental Business Consultants
FER	Final Engineering Report
HDPE	High Density Polyethylene
IRM	Interim Remedial Measure
NYC	New York City
NYCDEP	New York City Department of Environmental Protection
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PS	Public School
PVC	Polyvinyl Chloride
RAO	Remedial Action Objectives
RAWP	Remedial Action Work Plan
RI	Remedial Investigation
RSCOs	Recommended Site Cleanup Objectives
SCG	Standards, Criteria, and Guidelines
SMDS	Sub-Membrane Depressurization system (same as SSDS)
SMMP	Soil/Materials Management Plan (Same as SMDS)
SSDS	Sub-slab Depressurization System
SWPPP	Stormwater Pollution Prevention Plan
SVOCs	Semi-Volatile Organic Compounds
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds

CERTIFICATIONS

I Ariel Czemerinski certify that I am currently a NYS registered professional engineer and that this Site Management Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

076508

NYS Professional Engineer #

6/28/2018

Date



ES EXECUTIVE SUMMARY

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance and reporting activities required by this Site Management Plan:

Site Identification:	Site No: V00350 – 2 - Former Pfizer Property Site B – Operable Unit 2 177 Harrison Street, Brooklyn, New York 11206
Institutional Controls:	<p>1. The property may be used for restricted residential, commercial, and industrial uses;</p> <p>2. IC</p> <ul style="list-style-type: none"> • The property may be used for: restricted residential use; • All ECs must be operated and maintained as specified in this SMP; • All ECs must be inspected at a frequency and in a manner defined in the SMP; • The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department; • Environmental or public health monitoring must be performed as defined in this SMP; • Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP; • Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP; • Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP; • Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement; • The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries, and any potential impacts that are identified must be monitored or mitigated; and • Vegetable gardens and farming on the site are prohibited.
	3. All ECs must be inspected at a frequency and in a manner defined in the SMP. This statement is to be included here if there are ECs per the site’s remedial program.
Engineering Controls:	<p>1. Cover system</p> <p>2. Subslab Depressurization System</p>

Inspections:	Frequency
1. Cover inspection: Asphalt / Concrete -Lot 52	Quarterly
2. Cover inspection: Concrete - Lot 1	Annually
3. SSDS - Lot 1	Quarterly
Reporting:	
1. Composite Cover - Lot 52	Quarterly
2. Composite Cover - 1	Annually
2. Periodic Review Report	Annually

Further descriptions of the above requirements are provided in detail in the latter sections of this Site Management Plan.

1.0 INTRODUCTION

1.1 General

This Site Management Plan (SMP) Addendum was prepared for Block 2266 Lots 1 and 52 (the Site) which is part of the Former Pfizer Property Site B – Operable Unit 2 Site located in Brooklyn, New York and replaces the SMP prepared for Site B OU2 (Langan 1/2015). The SMP is a required element of the remedial program. The western portion of Pfizer Site B Operable Unit #2 (OU-2), is subject to a Voluntary Cleanup Agreement (VCA Index No. D2-0010-0703, Site No. V-00350-2) between Pfizer Inc. (former lessee of the Site) and the New York State Department of Environmental Conservation (NYSDEC) on August 18, 2003. The VCA was subsequently amended to add Oholei Shloma and YGS, Inc. as Volunteers on September 19, 2012. The eastern portion of OU-2 (Block 2266, Lot 52) and the eastern portion of Pfizer Site B (OU-3), which consists of Block 2266, Lots 45-50, are owned by Oholei Shloma. The Pfizer Site D property (OU-1), which is located south of the Site on Block 2269, Lot 1, is owned by Pfizer Inc. and became subject to the VCA for Site No. V-00350-2 by an amendment to the VCA in March 2011.

Figures showing the Site location and boundaries of the Site are provided as **Figures 1 and 2A-2B**. The boundaries of the Site are more fully described in the metes and bounds description that is part of the Environmental Easement (**Appendix A**).

After completion of the remedial work on Site B - OUII, some residual contamination was left at the Site, which is hereafter referred to as “remaining contamination”. Institutional and Engineering Controls (ICs/ECs) have been incorporated into the site remedy to control exposure to remaining contamination to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC, and recorded with the Kings County Clerk, requires compliance with this SMP and all ECs and ICs placed on the Site.

This SMP was prepared to manage remaining contamination at the Site until the Environmental Easement is extinguished in accordance with ECL Article 71, Title 36. This plan has been approved by the NYSDEC, and compliance with this plan is required by the grantor of the Environmental Easement and the grantor’s successors and assigns. This SMP may only be revised with the approval of the NYSDEC.

It is important to note that:

- This SMP details the site-specific implementation procedures that are required by the Deed Restriction. Failure to properly implement the SMP is a violation of the Environmental Easement, which is grounds for revocation of the Certificate of Completion (COC); and
- Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6NYCRR Part 375 and the VCA (Index Agreement No. D2-0010-0703, Site No. V00350) for the Site, and thereby subject to applicable penalties.

All reports associated with the Site can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

This SMP was prepared by AMC Engineering, PLLC (AMC), on behalf of Congregation YGS, in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May, 2010, and the guidelines provided by the NYSDEC. This SMP addresses the means for implementing the ICs and/or ECs that are required by the Environmental Easement for the Site. This SMP replaces the SMP prepared for Site B OU2 Lot 1 as prepared by Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. (1/2015)

1.2 Revisions

Revisions to this plan will be proposed in writing to the NYSDEC's project manager. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or shut-down of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change to the site conditions. In accordance with the Environmental Easement for the Site, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.3 Notifications

Notifications will be submitted by the property owner to the NYSDEC, as needed, in accordance with NYSDEC's DER – 10 for the following reasons:

- 60-day advance notice of any proposed changes in site use that are required under the terms of the VCA, 6NYCRR Part 375 and/or Environmental Conservation Law.
- 7-day advance notice of any field activity associated with the remedial program.
- 15-day advance notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan.
- Notice within 48-hours of any damage or defect to the foundation, structures or EC that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect.
- Verbal notice by noon of the following day of any emergency, such as a fire; flood; or earthquake that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to the NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the Site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, the NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the Voluntary Cleanup Agreement, and all approved work plans and reports, including this SMP.
- Within 15 days after the transfer of all or part of the Site, the new owner's name, contact representative, and contact information will be confirmed in writing to the NYSDEC.

Table 1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information.

Table 1: Notifications*

Name	Contact Information
Project Manager - Mandy Yau	man-tze.yau@dec.ny.gov 718-482-4897
NYSDEC Regional Chief, Superfund and Brownfield Cleanup Section - Jane O'Connell	jane.oconnell@dec.ny.gov; (718) 482-4599
NYSDEC Site Control Chief - Kelly Lewandowski	kelly.Lewandowski@dec.ny.gov; (518) 402-9553

* Note: Notifications are subject to change and will be updated as necessary.

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

2.1 Site Location and Description

The Site is located on the north side of Gerry Street between Throop Avenue and Harrison Avenue in the City of New York and Borough of Brooklyn (Kings County) as shown on **Figure 1**. The Site is designated as Block 2266, Lots 1 and 52 on the Brooklyn Tax Map. Lot 1 has 200 feet of frontage on Harrison Avenue and 150 feet of frontage on Gerry Street for a total area of 27,500 square feet. Lot 52 has 60 feet of street frontage on Gerry Street and a depth of 100 feet deep for a total of 6,000 square feet . The boundaries of the Site are shown in **Figures 2A and 2B** and fully described in **Appendix A: Environmental Easement**. The owner of each parcel at the time of issuance of this SMP is:

Lot 1

BAIS RUCHEL HIGH SCHOOL, INC.
174 RODNEY ST.
BROOKLYN NY 11211-7703

Lot 52

OHOLEI SHLOMA
517 FLUSHING AVE.
BROOKLYN NY 11205-1610

2.2 Physical Setting

2.2.1 Land Use

The Site is zoned R7A. The area immediately surrounding the Site has historically been used for heavy commercial operations such as fleet maintenance, metal fabrication and auto repair shops. However a significant number of new residential construction projects have recently begun, following an area wide rezoning completed by the City in 2005. Surrounding land use includes new residential buildings to the northwest, former Pfizer properties (currently vacant lots) to the west and southwest, new residential construction to the north, northeast and east, and the vacant former Pfizer D building to the southeast (OU-1 of this VCP Site).

2.2.2 Geology

The geologic and hydrogeologic conditions were characterized during multiple subsurface environmental and geotechnical investigations performed from 1996 through 2011 Roux Associates and Langan:

Four distinct geologic strata were encountered at the Site from land surface to a depth of approximately 70 feet below land surface (ft bls), and include:

- A brown sand stratum (i.e., fill material). This stratum was identified with an approximate thickness of 8 to 12 ft.
- A green clay/silt stratum that underlies the fill material with an approximate thickness of 1 ft to 3 ft.
- A brown fine to coarse sand stratum with minor amounts of silt and gravel that underlies the clay layer (where present) with an approximate thickness of 5 to 15.
- A 40 ft layer of coarse to fine sand.

The fill material is characterized as predominately fine to coarse sand, some concrete, brick, and slag fragments, trace to some gravel, and trace clay. Note that the majority of the fill on Lot 52, was previously excavated to a depth of 10 feet below grade in 2002.

2.2.3 Hydrogeology

Groundwater is present under water table conditions at a depth of approximately 4.6 to 8.7 ft below the surface. Groundwater elevation is sensitive to seasonal variations and recharge events. During previous investigations, the estimated groundwater flow direction at the Site was north to northeast (**Figure 3** – Roux Associates 6/2014).

2.3 Investigation and Remedial History

The following narrative provides a remedial history timeline and a brief summary of the available project records to document key investigative and remedial milestones for the Site. Full titles for each of the reports referenced below are provided in Section 8.0 - References.

- An Environmental Site Assessment (ESA) was performed to identify any environmental concerns associated with Site B that may present a risk to human health or the environment. The results of the Site B ESA were reported in the document titled "Environmental Site Assessment on Site B" (Roux Associates, 1996). Based on the Site inspection results, four areas of Site B were identified by Roux Associates for further investigation during the ESA. These areas included Lot I, the southwest portion of the concrete slab, the location of the former aboveground fuel oil tank (located in the former basement), and the location of a former roof drainpipe (located in the eastern portion of Site B).
- An investigation was performed to address data gaps identified in the ESA. The results were reported in the document titled "Results of the Supplemental Investigation at Site B" (Roux Associates, 1997a). The results indicated that volatile organic compounds (VOCs) and metals were detected in the fill material and perched groundwater. Additionally, the fill material was determined to be non-hazardous. The results of the Limited Risk Assessment (LRA) indicated that the presence of chemicals at the concentrations detected in the fill material at Site B do not pose a current or future risk under occupational or construction activities.
- An investigation that further delineated the petroleum-related impacts at Site B was performed in 1997. The results of the delineation work were reported in a September 4, 1997 Technical Memorandum: Summary of Toxicity Characteristic Leaching Procedure Testing Delineation Soil Borings at Site B (Roux Associates, 1997b).
- Pfizer performed a Phase I and Phase II Limited Site Investigation in February 2003 and April 2003, respectively, to address data gaps prior to the development of an SSI Work Plan. The Phase I LSI included the performance of a geophysical survey, a test pit program, and onsite characterization of groundwater quality; Phase II addressed upgradient groundwater quality, a vertical delineation of groundwater impacts, and confirmation of the groundwater quality onsite (Roux Associates, 2003).

- The Site B IRM Investigation Report was prepared and submitted on June 9, 2003 (Roux Associates, 2003).

- A two part Subsurface Investigation was completed in March 2005 (Roux). The findings were as follows:
 - The nature (VOCs, SVOCs and metals) and extent of soil impacts have been adequately categorized at Site B. The VOC source areas have been removed as part of the 2002 IRM. Residual levels of VOCs do not exceed the NYSDEC RSCOs.
 - Although SVOC and metal levels in soil at Site B exceed NYSDEC RSCOs, no further investigation or remediation of SVOCs and metals in soil at Site B is warranted because The vertical distribution and the various concentrations of SVOCs and metals do not exhibit a specific pattern, are typical components in historical fill; are not constituents of a release, and are ubiquitous in urban environments (i .e., Brooklyn, New York).
 - Residual levels of mercury and lead have been characterized as non-hazardous In nature.
 - There is currently little to no potential for persons (receptors) to be exposed to soil at the Site because the Site has limited activity occurring on it and is almost entirely covered by crushed stone.
 - Based on the Site's proposed future use as an adult trade school and adjacent parking lot, there will be little to no potential for persons to contact soil at the Site once redevelopment is complete.
 - Future workers at the Site engaged in soil-moving and excavation activities are not expected to be exposed to unacceptable levels of Site-related chemicals.
 - The nature (CVOCs) and extent of soil vapor impacts have been adequately categorized at Site B.
 - The passive loss of soil vapor from undisturbed soil to ambient air is not typically considered as a viable pathway for outdoor exposure.

- Focused Investigation and Additional Remedy Evaluation for MW3 and MW7 Areas (Roux Associates 2009). The findings were as follows:
 - Historical elevated concentrations of CVOCs (i.e., greater than 1,000 ppb) observed at monitoring wells MW-3 and MW-7 are due to dissolved CVOCs present from 15 ft bls to the confining clay unit in the vicinity of the two monitoring wells;
 - Addressing the elevated CVOCs in the groundwater proximate to monitoring wells MW-3 and MW-7 should be sufficient to meet the first two objectives toward achieving Site closure because there are no soil impacts due to CVOCs (i.e., no DNAPL) from 15 ft bls to the confining clay unit in the vicinity of the two monitoring wells;
 - The vertical extent of CVOC impacts in the vicinity of monitoring wells MW-3 and MW-7 has been delineated (i.e., from 15 ft bls to the confining clay unit at approximately 27 to 28 ft bls), but horizontal delineation is incomplete;
 - Soil vapor concentrations of PCE have decreased significantly from the levels detected in 2004 and 2005.

- Quarterly Sampling Progress Report - February through April 2012 (Roux). On February 23 and 24, 2012, a comprehensive groundwater gauging and sampling round was completed from onsite monitoring wells MW-3, MW-5, MW-6R, MW-7, MW-8, MW-14, MW-15, and MW-17, and offsite monitoring wells MW-1R, MW-9, MW-10, MW-11, MW-12, MW-16, MW-18, MW-19, and MW-20. On February 23, 2012, a two-hour duration soil vapor sample was collected from soil vapor sampling points SV-P1 and SV-P2, and an ambient air sample was collected from the upwind Site boundary. Findings were as follows:
 - VOC concentrations in groundwater at the up gradient, down gradient, and on-Site monitoring wells were generally consistent with historical data.
 - Soil vapor concentrations at SV-P1 and SV-P2 were generally consistent with the data reported in previous progress reports.

- Environmental Report and Remedial Investigation Report for Lot 1 (Langan 12/09 and 6/11). Langan summarizes the results of these investigations as follows: The contaminants identified in soil at the Site were associated with combustion by-products and waste entrained in historic fill, which extended to a maximum depth of approximately 12 feet bgs. The contaminants included metals and SVOCs. Four soil samples collected during investigations conducted by Langan and Roux contained total SVOCs at a concentration above 500 milligrams per kilogram (mg/kg). Total SVOC concentrations in these samples, collected from depths between 3 and 8 feet bgs, ranged from 1,395 to 20,416 mg/kg. Metals present in the fill materials on Lot 1 were reported by Langan as follows:

Analyte	Range (mg/kg)	Depth Range (feet bgs)
Lead	406 – 8,920	0 - 10
Mercury	0.32 - 621	0 - 10
Arsenic	17.1 – 20.5	0 - 8
Barium	441 – 2,760	0 - 11
Cadmium	4.92 - 18.2	3 - 8
Copper	1,300	0 - 2

Groundwater at the Site was impacted with three VOCs (benzene, cis-1,2-DCE, and vinyl chloride). Groundwater samples collected during Langan’s 2011 RI indicated that concentrations of metals and SVOCs in groundwater were insignificant and not the result of an on-site contaminant source. At the time of the 2011 RI, benzene ranged from 1.6 to 24 ug/L, cis1,2-DCE ranged from 45 to 1,700 ug/L and vinyl chloride ranged from 15 to 340 ug/L.

PCE was detected in eight soil vapor samples collected from depths of 3 and 5 feet bgs at five locations. PCE concentrations ranged from 28 µg/m³ to 659 µg/m. Trichloroethene (TCE), was detected at a concentration of 18.92 µg/m³ in a soil vapor sample collected from the City VCA Parcel (SV-N1).

- Construction Completion Report, 177 Harrison Avenue (Lot1) – February, 2015 (Langan Engineering). According to the CCR: The Site was remediated in accordance with the remedy selected by the NYSDEC in the August 23, 2011 Decision Document and the

modified soil cleanup objectives for lead, barium, and mercury established with NYSDEC. The following are the components of the selected remedy:

1. Implementation of a Community Air Monitoring Program (CAMP) for particulates and volatile organic compounds (VOC).
2. Soil excavation, as required, to a minimum depth of 2 feet below ground surface (bgs) to bring the Site to the development grade and accommodate foundation elements and a sub-membrane slab depressurization (SMD) system for the school building development. Construction excavation to approximately 7 feet bgs was required to accommodate an elevator pit on the northeastern portion of the Site.
3. Targeted excavation of seven areas of concern (AOC) to depths below construction sub-grade to remove all soil exceeding the SSSCOs. The SSSCOs established for this site were (1) the Part 375 Restricted Use Restricted Residential SCOs for volatile organic compounds (VOCs), PCBs, pesticides, and herbicides; (2) the Part 375 Commercial Use SCOs for metals; and (3) a total semivolatile organic compound (SVOC) concentration of 500 mg/kg with the exception of the following modifications:
 - The SSSCOs for lead and barium were increased to 1,500 mg/kg from the Part 375 Commercial Use SCOs of 1,000 mg/kg and 400 mg/kg, respectively; and
 - The SSSCO for mercury was increased to 5 mg/kg from the Part 375 Commercial Use SCO of 2.8 mg/kg.
4. Excavation of characteristic lead hazardous soil (i.e., soil exceeding 5 mg/l for lead via toxicity characteristic leaching procedure [TCLP] analysis).
5. Import of recycled concrete aggregate (RCA) conforming to the requirements of NYSDEC Policy DER-10 (Technical Guidance for Site Investigation and Remediation) and New York State Department of Transportation (NYSDOT) specifications for use in AOC excavation areas as backfill to construction grade.
6. Construction and maintenance of an engineered composite cover consisting of a building slab to prevent human exposure to residual contaminated soil/fill.

7. Installation of a vapor barrier system beneath the building slab and along exterior slab sidewalls to prevent contaminated soil vapors from migrating into the building.
8. Installation of an active sub-membrane depressurization (SMD) system to prevent accumulation and potential migration of contaminated soil vapors into the building.
9. Import of virgin stone as backfill beneath the composite cover system in compliance with the Remedial Action Work Plan (RAWP) and in accordance with applicable laws and regulations.
10. Sampling and analysis of excavated soil/fill in accordance with the requirements of the selected disposal facilities. The excavated soil/fill was classified and segregated based on the analytical results of soil characterization sampling.
11. Collection and analysis of soil endpoint samples in accordance with NYSDEC DER-10 section 5.4(b).
12. Transportation and off-site disposal of soil/fill material at permitted facilities in accordance with the RAWP, disposal facility requirements, and applicable laws and regulations for handling, transport, and disposal.
13. Screening of imported stone and RCA and excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a photoionization detector (PID).
14. Implementation of stormwater pollution prevention measures in compliance with applicable laws and regulations.
15. Performance of activities required for the remedial action in compliance with applicable laws and regulations.
16. Execution and recording of a Deed Restriction to restrict land use and prevent future exposure to any contamination remaining at the Site.
17. Submittal of a CCR that describes the remedial activities, certifies that the remedial requirements have been achieved, describes all Engineering and Institutional Controls to be implemented at the Site, and lists any deviations from this RAWP.

18. Development and implementation of a Site Management Plan for long term management of remaining contamination as required by the Environmental Easement, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting.
19. Periodic certification of the institutional and engineering controls listed above.
 - Construction Completion Report Addendum – February, 2018 (AMC Engineering). AMC prepared an Addendum to the Langan CCR to include Lot 52. The remedy for Lot 52 included the following elements:
 1. Construction of a temporary composite cover system consisting of 2 inches of asphalt across all of Lot 52; except for a 40’x14’ section at the rear of the lot, which is capped with approximately 4” of concrete.
 2. Development and implementation of a Site Management Plan for long term management of remaining contamination as required by the Deed Restriction which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting; and
 3. Execution and recording of a Deed Restriction to ensure implementation of the SMP and that the Site is only used for allowable uses following remediation.

2.4 Remedial Action Objectives

The Remedial Action Objectives (RAOs) for the Site as listed in the OUII RAWP (Langan, 8/22/2011), are as follows:

2.4.1 Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

2.4.2 Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

2.4.3 *Soil Vapor*

RAOs for Public Health Protection

- Prevent contact inhalation of volatiles emanating from contaminated groundwater or soil.

2.5 **Remaining Contamination**

2.5.1 *Soil*

Lot 1

As reported by Langan: Historic fill containing SVOCs and metals at concentrations above the Part 375 Unrestricted Use SCOs remains throughout the Site. The historic fill is overlain by RCA of varying thickness. The RCA is overlain by imported stone for the SMD system within the building footprint and for the site cap in the Northern Play Area and pedestrian walkways on the northern portion of the Site. All soil containing exceedances of the Track 4 SSSCOs was removed, with the exception of the following two localized areas:

- Endpoint sample AOC4-4E-EB-11 collected from AOC 4 at 11 feet bgs contained mercury at a concentration of 27.30 mg/kg, which exceeds the SSSCO of 5 mg/kg.
- Endpoint sample AOC4-4E-EW-6 along the eastern sidewall of AOC 4 at 6 feet bgs contained a total SVOC concentration of 642 mg/kg, which exceeds the SSSCO of 500 mg/kg.

Excavation in the central portion of AOC 4 near sample AOC4-4E-EB-11 was terminated due to the infiltration of groundwater into the excavation, upon approval by NYSDEC. Excavation along the eastern sidewall of AOC 4 near AOC4-4E-EW-6 was terminated, as NYSDEC determined the analytical results were acceptable in a November 8, 2011 e-mail. The final

extents of the remedial excavation were approved by NYSDEC, as documented in e-mail correspondences on November 28 and 29, 2011.

The following samples collected from the Site boundary (off-Site) contained contaminant concentrations above the SSSCOs:

- AOC1-2G-SW-4 (southern boundary): Barium and lead at concentrations of 3,220 mg/kg and 9,470 mg/kg, respectively, as compared to the SSSCO of 1,500 mg/kg.
- AOC3-4D-NW-6 (no northern boundary): Mercury at a concentration of 6.59 mg/kg, as compared to the SSSCO of 5 mg/kg.

The thickness of the RCA placed on top of the remaining contaminated soil varies from approximately 0.5 feet (along the Site's eastern boundary and in the northwestern corner) to 8.6 feet (AOCs 3 and 4). The RCA was placed directly on top of the contaminated material without an intermediate demarcation barrier. A barrier was not used due to the presence of groundwater in the deeper portions of the excavation and the density of foundation piles throughout the Site. The RCA and underlying historic fill can be differentiated, based on composition, texture, and grain size.

Table 2 and **Figure 4** summarize the results of all soil samples remaining on Lot 1 that exceeded the Track 1 Part 375 Unrestricted Use SCOs (Track 1) after completion of the Remedial Action.

Lot 52

Approximately 60 percent of the eastern portion of Lot 52 was excavated to a depth of 10 ft and backfilled with certified clean fill under an Interim Remedial Measure completed in 2002. Remaining contaminants in soil within the unexcavated area are defined by samples collected from soil borings advanced during area subsurface investigations performed by Pfizer in 1996 and 2004.

Historic fill soil has remains on the west and northwestern portions of Lot 52. Soil results from a boring in 1996 indicate that elevated levels (above restricted residential use SCOs) of mercury likely remain in the upper eight feet of soil in southwestern portion of the lot. Soil samples collected in 2005 indicate that the historic fill layer contains SVOCs (benzo(a)anthracene,

benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenz(a,h)anthracene, flouranthene, phenanthrene, pyrene and indeno(1,2,3-cd-pyrene) and metals (arsenic, barium, mercury and lead) above Restricted Residential Use SCOs. A summary of the compounds remaining above unrestricted and restricted residential use SCOs is presented in **Table 3** and **Figure 5**.

2.5.2 Groundwater

Previous investigations conducted by Pfizer Inc. identified VOCs in groundwater and soil vapor samples at concentrations above the NYSDEC TOGS 1.1.1 Class GA Ambient Water Quality Standards (TOGS AWQS) and New York State Department of Health (NYSDOH) Air Guideline Values (AGVs), respectively. It has been determined that the contaminated groundwater identified on OU-2 is coming from the other Operable Units (OU-1 and OU-3) of Pfizer Sites B and D. The Volunteers are addressing potential groundwater impacts on OU-1 and OU-3 and will perform site-wide groundwater monitoring in accordance with the August 2003 VCA and approved Remedial Action Work Plans for those OUs. Groundwater remediation was not a component of the Remedial Action Work Plan for OU-2. A summary of the compounds remaining above groundwater standards on Lot 52 is presented in **Table 4** and **Figure 6**.

2.5.3 Soil Vapor

Post-remedial soil vapor sampling has not been conducted; however, a subslab depressurization system and soil vapor barrier have been installed beneath the new building on Lot 1 and are specified for any new construction with a foundation above the water table to prevent infiltration of contaminated soil vapor from contaminated groundwater into the occupied spaces of the new structure.

Since contaminated groundwater/soil vapor remains beneath the Site after completion of the Remedial Action, Institutional and Engineering Controls are required to protect human health and the environment. These Engineering and Institutional Controls (ECs/ICs) are described in the following sections. Long-term management of these EC/ICs and residual contamination will be performed under the Site Management Plan (SMP) approved by the NYSDEC.

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

3.1 General

Residual contamination above Restricted Residential Use SCOs remains at the Site. Institutional Controls (ICs) and Engineering Controls (ECs) therefore are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all IC/ECs at the Site. The IC/EC Plan is one component of the SMP and is subject to revision by the NYSDEC.

This plan provides:

- A description of all IC/ECs on the Site;
- The basic implementation and intended role of each IC/EC;
- A description of the key components of the ICs set forth in the deed restrictions;
- A description of the controls to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of IC/ECs; such as the implementation of the Excavation Work Plan (EWP) (as provided in **Appendix B**) for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the site; and
- Any other provisions necessary to identify or establish methods for implementing the IC/ECs required by the site remedy, as determined by the NYSDEC.

3.2 Institutional Controls

A series of ICs is required by the Decision Document to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination; and, (3) limit the use and development of the Site to restricted residential, commercial or industrial uses only. Adherence to these ICs on the Site is required by the deed restrictions and will be implemented under this SMP. ICs identified in the deed restrictions may not be discontinued without an amendment to or extinguishment of the deed restrictions. The IC boundaries are shown on **Figures 2A** and **2B**. These ICs are:

- The property may be used for restricted-residential use;
- All ECs must be operated and maintained as specified in this SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP;
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;
- Data and information pertinent to site management must be reported at the frequency and in a manner as defined in this SMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;
- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;
- Access to the Site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the deed restrictions;
- The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries noted on **Figures 2A** and **2 B**, and any potential impacts that are identified must be monitored or mitigated; and
- Vegetable gardens and farming on the Site are prohibited;

3.3 Engineering Controls

3.3.1 Composite Cover System

Lot 1

Exposure to remaining contamination in soil/fill at the Site is prevented by a composite cover system placed over the Site. This cover system is comprised of a 10-inch-thick concrete building slab within the building footprint, asphalt pavement in the Northern Play Area, and a concrete-covered walkway along the perimeter of the Northern Play Area. **Figure 7** presents the location and details of the cover system type for Lot 1.

Lot 52

Soil with elevated concentrations of SVOCs and the metal mercury are present below the surface in the previously unexcavated areas of the Site (**Figure 2B**). Exposure to remaining contamination at the Site is prevented by a cover system placed over the Site. This cover system is comprised of approximately 2 inches of asphalt across the majority of the lot with the exception of a 40'x14' section in the rear of the lot, which is capped with approximately 4" of concrete. **Figure 8** presents the location and details of the cover system type for Lot 52.

The Excavation Work Plan (EWP) provided in **Appendix B** outlines the procedures required to be implemented in the event the cover system on either Lot 1 or 52 is breached, penetrated or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection of this cover are provided in the Monitoring and Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must be conducted in accordance also with the procedures defined in a Health and Safety Plan (HASP) (**Appendix C**) and associated Community Air Monitoring Plan (CAMP) prepared for the Site and provided in **Appendix D**.

3.3.2 Vapor Barrier (Lot 1)

A soil vapor barrier was installed on Lot 1 between the concrete floor slab and underlying imported stone to prevent infiltration of potentially impacted soil vapors into the structure. The barrier/membrane system was installed along the entire footprint of the Site beneath the floor slab and elevator pit. The system consists of VaporBlock® Plus 20, a 20-mil polyethylene vapor retarder manufactured by Raven Industries. Overlaps between sheets were sealed with VaporBond® 4' Seaming Tape and Butyl Seal 2-Sided Tape. Penetrations for utilities were sealed with VaporBoot® Pipe Boot System 25/Tube plus Tape.

Procedures for operating and maintaining the soil vapor barrier/membrane system are provided in the Operation and Maintenance Plan in Section 4 of this SMP. Procedures for monitoring the system are included in the Monitoring Plan (Section 3 of this SMP). The Monitoring Plan also addresses severe condition inspections in the event that a severe condition, which may affect controls at the Site, occurs. The location of the soil vapor barrier system and cross sections of the

composite cover system are shown in **Figure 7**. Documentation of the vapor barrier, including specifications, product and technical data sheets is provided in **Appendix E**.

3.3.3 Subslab Depressurization System (Lot 1)

An active subslab depressurization (SSD) system was installed beneath the soil vapor barrier to prevent infiltration of potentially impacted soil vapors into the structure. The system was installed in accordance with the October 2006 NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York. The SSD system uses a roof-mounted vacuum blower to create a negative pressure field underneath the vapor barrier and the building, which prevents the intrusion of soil vapor into the building. Soil vapor is collected into sub-grade piping and vented from a roof-mounted stack. The SSD system will operate continuously.

The SSD system consists of a system of horizontal, interconnected, 4-inch diameter perforated high density polyethylene (HDPE) piping placed in a 6-inch layer of clean ¾-inch stone. The ¾-inch stone was placed directly onto a geotextile base above the RCA and consisted of virgin trap rock (diabase) meeting New York State Department of Transportation specifications. The stone was obtained from a Tilcon-operated quarry located in Haverstraw, New York. The system underlies the soil vapor barrier, which extends underneath the entire floor slab. The horizontal piping is connected to a vertical, sub-grade vapor collection pipe located on the western portion of the Site. The collection pipe attaches to a 4-inch diameter metal riser that extends through the floor slab, along the interior wall of the building, to the roof where it connects with a roof-mounted regenerative blower unit. The blower is a Model No. 3BA1600-7AT16 unit manufactured by Airtech Inc. of Englewood, New Jersey. The blower operates with a 3.4 horsepower motor and is capable of maintaining a flow rate of 190 cubic feet per minute with a vacuum of 25 inches of water column. The blower connects to a remote alarm box located in the maintenance office on the first floor. A red light alarm signal is activated by shutdown of the blower. system. The as-built design for the SMD system is provided in **Appendix F**.

Procedures for operating and maintaining the SMD system are provided in the Operation and Maintenance Plan in Section 4 of this SMP. The operation and maintenance manual for the SMD system blower is included in **Appendix G**. Procedures for monitoring the system are included in the Monitoring Plan in Section 4.3 of this SMP. The Monitoring Plan also addresses severe

condition inspections in the event that a severe condition (e.g., a major storm event), which may affect controls at the Site, occurs.

3.3.4 Soil Vapor Intrusion (SVI) Evaluation

Prior to the construction of any enclosed structures over remaining exposed areas (i.e., the Northern Play Area, Lot 52), an SVI evaluation will be performed to determine whether any mitigation measures are necessary to eliminate potential exposure to vapors in the proposed structure. Alternatively, an SVI mitigation system may be installed as an element of the building foundation without first conducting an investigation. This mitigation system will include a vapor barrier and passive sub-slab or sub-membrane depressurization system that is capable of being converted to an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to the NYSDEC and NYSDOH for approval. This work plan will be developed in accordance with the most recent NYSDOH Guidance for Evaluating Vapor Intrusion in the State of New York. Measures to be employed to mitigate potential vapor intrusion will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH guidance, and construction details of the proposed structure.

Preliminary (unvalidated) SVI sampling data will be forwarded to the NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation. If any indoor air test results exceed NYSDOH guidelines, relevant NYSDOH fact sheets will be provided to all tenants and occupants of the property within 15 days of receipt of validated data.

3.3.5 Post-Remediation Groundwater Monitoring

Previous investigations performed at the Site have identified Pfizer - Site D, located on the southeast side of Gerry Street, as the source of chlorinated VOCs in groundwater which appear to be migrating onto the Site in a northerly direction. Chlorinated VOCs previously identified in on-Site groundwater primarily includes tetrachloroethene (PCE) and one or more of its breakdown products, including trichloroethene, cis-dichloroethene and vinyl chloride.

Chemical oxidant injections associated with OUI are intended to significantly reduce the CVOC contamination in groundwater, and thereby accelerate the improvements in groundwater and soil vapor quality. Following the injections, groundwater performance monitoring samples are to be collected to assess the performance of the remedy. Installation of the monitoring wells, injection of the chemical oxidant, collection and analysis of the performance groundwater samples, and all reporting will be performed by Remedial Engineering, P.C. and documented in the OUI Completion Report.

3.3.6 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10.

Composite Cover (Lots 1 and 52)

The composite cover system is a permanent control and the quality and integrity of this system will be inspected in perpetuity at defined, regular intervals in accordance with this SMP.

Subslab Depressurization System (Lot 1)

The active SMD system will not be discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicates that the SMD system is no longer required, a proposal to discontinue the system will be submitted by the property owner to the NYSDEC and NYSDOH.

4.0 MONITORING PLAN

4.1 General

This Monitoring Plan describes the measures for evaluating the overall performance and effectiveness of the remedy. This Monitoring Plan may only be revised with the approval of the NYSDEC. Details regarding inspection and evaluation of the ECs are provided in the following sections.

This Monitoring Plan describes the methods to be used for:

- Evaluating site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment;

To adequately address these issues, this Monitoring Plan provides information on:

- Annual inspection and periodic certification.

Reporting requirements are provided in Section 7.0 of this SMP.

4.2 Site – Wide Inspection

Site-wide inspections will be performed at a minimum of once per year, with inspections of the asphalt/concrete cap on Lot 52 conducted quarterly. Modification to the frequency or duration of the inspections will require approval from the NYSDEC. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs or monitoring devices. During these inspections, an inspection form will be completed as provided in **Appendix H** – Site Management Forms. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General site conditions at the time of the inspection;
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection; and
- Confirm that site records are up to date.

Inspections of all remedial components installed at the Site will be conducted. A comprehensive site-wide inspection will be conducted and documented according to the SMP schedule,

regardless of the frequency of the Periodic Review Report. The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;
- Compliance with requirements of this SMP and the Environmental Easement;
- Achievement of remedial performance criteria; and
- If site records are complete and up to date.

Reporting requirements are outlined in Section 7.0 of this plan. Inspections will also be performed in the event of an emergency. If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, verbal notice to the NYSDEC must be given by noon of the following day. In addition, an inspection of the Site will be conducted within 5 days of the event to verify the effectiveness of the IC/ECs implemented at the Site by a qualified environmental professional, as determined by the NYSDEC. Written confirmation must be provided to the NYSDEC within 7 days of the event, and include a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

4.3 Composite Cover System Monitoring

Monitoring of the Composite Cover System will be performed on a routine basis, as identified in **Table 5A – Composite Cover Remedial System Monitoring Requirements and Schedule** (see below). Modification to the frequency or sampling requirements will require approval from the NYSDEC. A visual inspection of the complete system will be conducted during each monitoring event. The Composite Cover System for Lot 1 consists of a 10-inch-thick concrete building slab within the building footprint, asphalt pavement in the Northern Play Area, and a concrete-covered walkway along the perimeter of the Northern Play Area. The composite cover system for Lot 52 consists of approximately 2 inches of asphalt across the majority of the lot, and approximately 4 inches of concrete over a 40'x 14' section at the rear of the lot. The composite cover systems will be monitored to document existing conditions and ensure no penetrations or damage has occurred which will affect cover system integrity. The cover systems are in place to prevent human exposure to remaining soil/fill at the Site.

Unscheduled inspections may take place when a suspected failure of the Composite Cover System has been reported or an emergency occurs that is deemed likely to affect the operation of the system. The Composite Cover System components to be monitored include, but are not limited to, the components included in **Table 5A** below.

Table 5A – Composite Cover Remedial System Monitoring Requirements and Schedule

Cover Component	Monitoring Parameter	Monitoring Schedule
Lot 1 - 10-inch-thick concrete building slab	Inspect for penetrations, holes, cracks, etc. & determine if repair/replacement is required	Annual
Lot 1 - 2 inch asphalt and 4 inch concrete walkways	Inspect for damage, and determine if repair/replacement is required.	Annual
Lot 52 - Asphalt Pavement (\approx 2 inches thick) and concrete(\approx 4 inches thick) rear section	Inspect for damage, and determine if repair/replacement is required.	Quarterly

A complete list of components to be inspected is provided in the Inspection Checklist, provided in **Appendix H** - Site Management Forms. If any penetrations, holes, cracks or other disturbances are noted within the composite cover system components, maintenance and repair, as per the Operation and Maintenance Plan, is required immediately.

4.4 Subslab Depressurization System Monitoring

Monitoring of each sub-slab depressurization (SSD) system will be performed on a routine basis, as identified in **Table 5B** – SSDS Remedial System Monitoring Requirements and Schedule (see below). Modification to the frequency or sampling requirements will require approval from the NYSDEC. A visual inspection of each complete system will be conducted during each monitoring event. Unscheduled inspections and/or sampling may take place when a suspected failure of an SSD system has been reported or an emergency occurs that is deemed likely to affect the operation of the system. SSD system components to be monitored include, but are not limited to, the components included in **Table 5B** below.

Table 5B – SSDS Remedial System Monitoring Requirements and Schedule

Remedial System Component	Monitoring Parameter	Operating Range	Monitoring Schedule
Vacuum Blower	On or Off		Quarterly
Vacuum Gauge	Vacuum at Blower	1”W.C.	Quarterly
Alarm	Alarm trips when fan shut off		Quarterly

A complete list of components to be inspected is provided in the Inspection Checklist, provided in **Appendix H** - Site Management Forms. If any equipment readings are not within their specified operation range, any equipment is observed to be malfunctioning or the system is not performing within specifications; maintenance and repair, as per the Operation and Maintenance Plan, is required immediately.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 General

This Operation and Maintenance Plan provides a brief description of the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the Site.

This Operation and Maintenance Plan:

- Includes the procedures necessary to allow individuals unfamiliar with the Site to operate and maintain the sub-slab depressurization (SSD) systems;
- Will be updated periodically to reflect changes in site conditions or the manner in which the SSD systems are operated and maintained.

Further detail regarding the Operation and Maintenance of the SSD system is provided in **Appendix G - Operation and Maintenance Manual**. A copy of this Operation and Maintenance Manual, along with the complete SMP, is maintained at the Site. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of this SMP.

5.2 Remedial System (or other Engineering Control) Performance Criteria

An active SSD system was installed beneath the soil vapor barrier to prevent infiltration of potentially impacted soil vapors into the Site building. The system was installed in accordance with the October 2006 NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York. The SSD system uses a roof-mounted vacuum blower to create a negative pressure field underneath the vapor barrier and the building thereby channeling soil vapor away from the building. Soil vapor is collected into sub-grade piping and vented from a roof-mounted stack. The SSD system will operate continuously.

5.3 Operation and Maintenance of the Sub-Slab Depressurization (SSD) System

The following sections provide a description of the operations and maintenance of the SSD system. Cut-sheets and as-built drawings for SSD system are provided in **Appendix F**.

5.3.1 System Start-Up and Testing

Prior to initial start-up of the SSD system, an inspection will be performed to confirm that all system components are in place. All equipment will then be started in accordance with the

manufacturer's recommendations (the blower OM&M plan is provided in **Appendix G**). System testing will be performed, as follows:

5.3.1.1 System Start-Up

- While the system operates, smoke tubes will be used to check for leaks through concrete cracks, floor joints, and at the suction points. Any leaks identified will be properly sealed.
- The warning device indicating blower malfunction will be tested to confirm proper operation.

5.3.2.1 System Testing

- After the approval of the SMP, indoor and outdoor air sampling will be performed during the heating season (November 1 – March 1). Samples will be analyzed for the constituents of concern (i.e., VOCs) via EPA Method TO-15 to confirm that concentrations are below background levels. The air samples will be collected and analyzed in accordance with the October 2006 NYSDOH Soil Vapor Guidance document.
- If the sampling results indicate elevated concentrations of VOCs, the source or cause (e.g., indoor or outdoor sources, improper operation of the SMD system, etc.) will be identified and corrected as necessary.

The system testing described above will be conducted if, in the course of the SSD system lifetime, the system goes down or significant changes are made to the system and the system must be restarted, except that the slab will not have to be drilled again to test for vacuum. For additional information regarding system start-up, maintenance, and testing, see **Appendix G - Operations and Maintenance Manual**.

5.3.2 Routine System Operation and Maintenance

The vacuum blower will operate continuously after initial startup. All equipment will be operated in accordance with manufacturer's recommendations (see **Appendix G**). During the course of operation for the active SSD system, especially immediately after start-up, technical difficulties may be encountered and/or the SSD system may not operate within design specifications. Any required maintenance, adjustments, or repairs to the blower system will be conducted as per the manufacturer's recommendations. The non-blower components of the system (i.e., riser, suction

pit, and underground piping) are passive; therefore, maintenance, adjustments, or repairs are not anticipated.

Routine equipment maintenance (e.g., replacing vent fans), repairs, and/or adjustments will be determined based on the life expectancy and warranty for the specific part as well as visual observations over time. The need for repairs and/or adjustments will be based on comparisons between the ongoing system performance and the performance when system operations were initiated. Routine maintenance activities and minimum schedules are provided in the SSD system manual (**Appendix G**). Routine maintenance of the accessible, non-mechanical SSD system components (i.e., riser) is not anticipated.

5.3.3 *Non-Routine Operation and Maintenance*

Non-routine maintenance may also be required during the operation of the SSD system, including the following situations:

- The building's owner or occupants report that the warning device indicates the system is not operating properly;
- The system becomes damaged; and/or
- The building undergoes renovations that may reduce the effectiveness of the system.

Activities conducted during non-routine maintenance visits will vary depending upon the reason for the visit. NYSDEC will be informed of any failure of the SSD System within 48-hours. Repairs or adjustments will be made to the system as appropriate and as per manufacturer guidelines within 15 days of the equipment failure, whenever possible (i.e., pending availability of parts). If necessary, the system will be redesigned and restarted.

5.3.4 *System Monitoring Devices and Alarms*

The SMD (SSD) system includes a warning device consisting of a red light alarm signal in the first floor maintenance office. The signal indicates when the system is not operating properly. In the event the warning device is activated, applicable maintenance and repairs will be conducted, as specified in the Operation and Maintenance Plan, and the SMD system will be restarted.

Operational problems will be noted in the Periodic Review Report to be prepared for that reporting period. A vacuum gauge is installed on the inlet side of the blower with a range of 0-30" H₂O.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

Increases in both the severity and frequency of storms/weather events, an increase in sea level elevations along with accompanying flooding impacts, shifting precipitation patterns and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to impact significantly the performance, effectiveness and protectiveness of a given site and associated remedial systems. Vulnerability assessments provide information so that the Site and associated remedial systems are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding.

This section provides a summary of vulnerability assessments that will be conducted for the Site during periodic assessments, and briefly summarizes the vulnerability of the Site and/or engineering controls to severe storms/weather events and associated flooding.

The Site is located in Brooklyn, NY at an elevation of 16 feet above the National Geodetic Vertical Datum (NGVD). According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), the Site is not located within a flood hazard area. The Site is served by the NYC Municipal sewer system and the completed building will meet all NYC building codes for drainage. Therefore, the Site is not considered to be vulnerable to storm events related to climate change.

6.2 Green Remediation Evaluation

NYSDEC's DER-31 Green Remediation requires green remediation concepts and techniques be considered during all stages of the remedial program including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. This section of the SMP provides a summary of any green remediation evaluations to be completed for the Site during site management, and as reported in the Periodic Review Report (PRR).

6.2.1 *Timing of Green Remediation Evaluations*

For major remedial system components, green remediation evaluations and corresponding modifications will be undertaken as part of a formal Remedial System Optimization (RSO), or at any time that the Project Manager feels appropriate, e.g. during significant maintenance events or in conjunction with storm recovery activities.

Modifications resulting from green remediation evaluations will be routinely implemented and scheduled to occur during planned/routine operation and maintenance activities. Reporting of these modifications will be presented in the PRR.

6.2.2 *Frequency of System Checks, Sampling and Other Periodic Activities*

Transportation to and from the Site and use of consumables in relation to visiting the Site in order to conduct system checks and or collect samples and shipping samples to a laboratory for analyses have direct and/or inherent energy costs. The schedule and/or means of these periodic activities have been prepared so these tasks can be accomplished in a manner that does not impact remedy protectiveness but reduces expenditure of energy or resources.

As part of this effort, consideration shall be given to:

- Reduced site visits and system checks;
- Coordination/consolidation of activities to maximize foreman/labor time; and
- Use of mass transit for site visits, where available.

6.2.3 *Metrics and Reporting*

As discussed in Section 7.0 information on energy usage, solid waste generation, transportation and shipping, water usage and land use and ecosystems will be recorded to facilitate and document consistent implementation of green remediation during site management and to identify corresponding benefits; a set of metrics has been developed.

7.0. REPORTING REQUIREMENTS

7.1 Site Management Reports

All site management inspection, maintenance and monitoring events will be recorded on the appropriate site management forms provided in **Appendix H**. These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including media sampling data and system maintenance reports, generated for the Site during the reporting period will be provided in electronic format to the NYSDEC in accordance with the requirements of **Table 6** and summarized in the Periodic Review Report.

Table 6. Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Site wide Inspection Report	Annually
Cover Inspection - Lot 1	Annually
Cover Inspection - Lot 52	Quarterly
SSD System Inspection	Quarterly
Periodic Review Report	Annually, or as otherwise determined by the Department

* The frequency of events will be conducted as specified until otherwise approved by the NYSDEC.

All interim monitoring/inspections reports will include, at a minimum:

- Date of event or reporting period;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
- Type of samples collected (e.g., sub-slab vapor, indoor air, outdoor air, etc);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;

- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether contaminant conditions have changed since the last reporting event.

Routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting maintenance activities;
- Description of maintenance activities performed;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

Non-routine maintenance event reporting forms will include, at a minimum:

- Date of event;
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Description of non-routine activities performed;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet); and
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

Data will be reported in digital format as determined by the NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQUIS™ database in accordance with the requirements found at this link <http://www.dec.ny.gov/chemical/62440.html>.

7.2 Periodic Review Report

A Periodic Review Report (PRR) will be submitted to the Department beginning sixteen (16) months after the Certificate of Completion (COC) is issued. After submittal of the initial Periodic Review Report, the next PRR shall be submitted every 1 year to the Department or at another frequency as may be required by the Department. In the event that the Site is subdivided into separate parcels with different ownership, a single Periodic Review Report will be prepared that addresses the Site described in **Appendix A** - Environmental Easement. The report will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the Periodic Review Report. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the Site.
- Results of the required quarterly and annual site inspections and severe condition inspections, if applicable.
- All applicable site management forms and other records generated for the Site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted.
- A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions.
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil vapor, etc.), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data as part of an evaluation of contaminant concentration trends.
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQUIS™ database in accordance with the requirements found at this link: <http://www.dec.ny.gov/chemical/62440.html>.
- A site evaluation, which includes the following:
 - The compliance of the remedy with the requirements of the site-specific RAWP or Decision Document;

- The operation and the effectiveness of all treatment units, etc., including identification of any needed repairs or modifications;
- Any new conclusions or observations regarding site contamination based on inspections or data generated by the Monitoring Plan for the media being monitored;
- Recommendations regarding any necessary changes to the remedy and/or Monitoring Plan;
- Trends in contaminant levels in the affected media will be evaluated to determine if the remedy continues to be effective in achieving remedial goals as specified by the Decision Document; and
- The overall performance and effectiveness of the remedy.

7.2.1 *Certification of Institutional and Engineering Controls*

Following the last inspection of the reporting period, a qualified environmental professional or Professional Engineer licensed to practice in New York State will prepare, and include in the Periodic Review Report, the following certification as per the requirements of NYSDEC DER-10:

“For each institutional or engineering control identified for the Site, I certify that all of the following statements are true:

- *The inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under my direction;*
- *The institutional control and/or engineering control employed at this site is unchanged from the date the control was put in place, or last approved by the Department;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any site management plan for this control;*
- *Access to the site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*

- *If a financial assurance mechanism is required under the oversight document for the site, the mechanism remains valid and sufficient for the intended purpose under the document;*
- *Use of the site is compliant with the environmental easement;*
- *The engineering control systems are performing as designed and are effective;*
- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program and generally accepted engineering practices; and*
- *The information presented in this report is accurate and complete.*
- *No new information has come to my attention, including groundwater monitoring data from wells located at the site boundary, if any, to indicate that these assumptions made in the qualitative exposure assessment of off-site contamination are no longer valid; and*
- *The assumptions made in the qualitative exposure assessment remain valid.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner/Remedial Party or Owner's/Remedial Party's Designated Site Representative] (and if the site consists of multiple properties): [I have been authorized and designated by all site owners/remedial parties to sign this certification] for the Site."

Every five years the following certification will be added:

- *The assumptions made in the qualitative exposure assessment remain valid.*

The signed certification will be included in the Periodic Review Report. The Periodic Review Report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the Site is located and the NYSDOH Bureau of Environmental Exposure Investigation. The Periodic Review Report may need to be submitted in hard-copy format, as requested by the NYSDEC project manager.

7.3 Corrective Measures Work Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a Corrective Measures Work Plan will be submitted to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the Corrective Measures Work Plan until it has been approved by the NYSDEC.

8.0 REFERENCES

6NYCRR Part 375, Environmental Remediation Programs. *December 14, 2006.*

AMC Engineering, PLLC, *Construction Completion Report Addendum, Former Pfizer Property, Site B – Operable Unit 2, February 2018.*

Langan Engineering, *Remedial Action Work Plan, Pfizer Site B & D, Operable Unit 2, August 22, 2011*

NYSDEC, Division of Environmental Remediation – *Decision Document Pfizer Sites B & D, Operable Unit 2, Remediation, May 3, 2010.*

NYSDEC, Division of Environmental Remediation / DER-10 – *Technical Guidance for Site Investigation and Remediation, May 3, 2010.*

NYSDEC, Division of Water, June 1998, Addendum April 2000, *Technical and Administrative Guidance Series (TOGS) 1.1.1, Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations.*

NYSDOH, Center for Environmental Health, October 2006, *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York.*

TABLES

Table 1: Notifications*

Name	Contact Information
Project Manager - Mandy Yau	man-tsz.yau@dec.ny.gov 718-482-4897
NYSDEC Regional Chief, Superfund and Brownfield Cleanup Section - Jane O'Connell	jane.oconnell@dec.ny.gov; (718) 482-4599
NYSDEC Site Control Chief - Kelly Lewandowski	kelly.Lewandowski@dec.ny.gov; (518) 402-9553

* Note: Notifications are subject to change and will be updated as necessary.

TABLE 2
ENDPOINT SAMPLE RESULTS
LOT 1

LOCATION SAMPLING DATE LAB SAMPLE ID	TRACK 1 SOIL CLEANUP OBJECTIVE	TRACK 4 SITE-SPECIFIC SOIL CLEANUP OBJECTIVE	AOC1-2G-SW-4' 16 NOV 2011 SB39456-01	AOC1-2G-EW-4' 16 NOV 2011 SB39456-033	AOC1-2C-NW-4' 16 NOV 2011 SB39456-06	AOC1-2C-SW-4' 16 NOV 2011 SB39456-08	AOC1-2F-NW-4' 16 NOV 2011 SB39456-02RE1	AOC1-NWT1-4' 16 NOV 2011 SB39456-04	SBB-08 2-24' Roux (1998-2005) SBB-08 2-24'	SBB-08 5-7' Roux (1998-2005) SBB-08 5-7'	
VOCs (ug/kg)											
Methylene chloride	50	100,000	NA	10 J	NA	9.4 O01, J	NA	NA	NA	NA	
SVOCs (ug/kg)											
1-Methylnaphthalene	-	-	NA	NA	1520 J	1090 U	NA	NA	NA	NA	
Acenaphthene	20000	-	NA	NA	6670 J	1720 J	NA	NA	NA	NA	
Acenaphthylene	100000	-	NA	NA	2110 J	950 U	NA	NA	NA	NA	
Anthracene	100000	-	NA	NA	14900	5530 J	NA	NA	NA	NA	
Benzo (a) anthracene	1000	-	NA	NA	29700	18200	NA	NA	NA	NA	
Benzo (a) pyrene	1000	-	NA	NA	27300	19500	NA	NA	NA	NA	
Benzo (b) fluoranthene	1000	-	NA	NA	22700	17900	NA	NA	NA	NA	
Benzo (g,h,i) perylene	100000	-	NA	NA	15500	12100	NA	NA	NA	NA	
Benzo (k) fluoranthene	800	-	NA	NA	22700	13200	NA	NA	NA	NA	
Chrysene	1000	-	NA	NA	25600	15600	NA	NA	NA	NA	
Dibenzo (a,h) anthracene	330	-	NA	NA	3520 J	2760 J	NA	NA	NA	NA	
Dibenzofuran	-	-	NA	NA	4210 J	1160 U	NA	NA	NA	NA	
Fluoranthene	100000	-	NA	NA	66800	31900	NA	NA	NA	NA	
Fluorene	30000	-	NA	NA	6670 J	1470 J	NA	NA	NA	NA	
Indeno (1,2,3-cd) pyrene	500	-	NA	NA	14600	11300	NA	NA	NA	NA	
Naphthalene	12000	-	NA	NA	1100 J	751 U	NA	NA	NA	NA	
Phenanthrene	100000	-	NA	NA	72700	21900	NA	NA	NA	NA	
Pyrene	100000	-	NA	NA	79900	43000	NA	NA	NA	NA	
Total SVOCs	-	500000	NA	NA	418200	216080	NA	NA	NA	NA	
Herbicides (ug/kg)											
	-	-	ND	ND	NA	ND	NA	NA	NA	NA	
PCBs (ug/kg)											
	-	-	ND	ND	NA	ND	NA	NA	NA	NA	
Pesticides (ug/kg)											
	-	-	ND	ND	NA	ND	NA	NA	NA	NA	
Total Metals (mg/kg)											
Mercury	0.18	5	NA	NA	NA	NA	NA	NA	NA	NA	
Arsenic	13	16	NA	NA	8.25	5.92	NA	NA	NA	NA	
Lead	63	1500	9470 GS1	404	689	695	1010	NA	657	1330	
Barium	350	1500	3220 GS1	2120	866	411	1850	156	539	1320	
TLCP Metals (mg/l)											
	-	-	NA	NA	NA	NA	NA	NA	NA	NA	

NOTES:

- Track 1 Soil Cleanup Objective (SCO) corresponds to the New York State Department of Environmental Conservation (NYSDEC) 6 NYCRR Part 375 Unrestricted Use SCO.
 - Track 4 Site-Specific Soil Cleanup Objectives SSSCOs are as follows: (1) Characteristic Lead Hazardous Soils (i.e., 5 mg/L TCLP), (2) Total SVOCs at 500000 ug/kg, and (3) Metals exceeding Part 375 Commercial Use SCO, with the exception of (a) 1,500 mg/kg for lead and barium, and (b) 5 mg/kg for mercury.
 - Only detected concentrations are presented. Track 1 SCO exceedances are shown in *italics* and Track 4 SSSCOs are bold and highlighted.
- U = analyte not detected at or above the level indicated
J = analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
- = this indicates that no regulatory limit has been established for this analyte
NA = Sample not analyzed for this parameter.
ND = Compound was not detected.
GS1 = Sample dilution required for high concentration of target analytes to be within instrument calibration range.
O01 = Compound has is a common labroatory contaminant.
SCO = Soil Cleanup Objective
SSSCO = Site-Specific Soil Cleanup Objective

TABLE 2
ENDPOINT SAMPLE RESULTS
LOT 1

LOCATION SAMPLING DATE LAB SAMPLE ID	TRACK 1 SOIL CLEANUP OBJECTIVE	TRACK 4 SITE- SPECIFIC SOIL CLEANUP OBJECTIVE	AOC2-3F-NW-4' 1 NOV2011 K2255-02A	AOC2-3F-EW-4' 1 NOV2011 K2255-03A	AOC2-3G-SW-4' 1 NOV2011 K2255-04A	AOC2-4F-WW-4' 1 NOV2011 K2255-05A	3F-B-3 1 NOV2011 K2255-10A	3G-SW-3 1 NOV2011 K2255-11A	AOC2D-SW-4' 16 NOV2011 SB39456-10
VOCs (ug/kg)									
Methylene chloride	50	100,000	NA	NA	NA	NA	NA	NA	7.9 O01, J
SVOCs (ug/kg)									
1,2,4-Trichlorobenzene	-	-	NA	NA	NA	NA	NA	NA	318 U
1-Methylnaphthalene	-	-	NA	NA	NA	NA	NA	NA	510 U
2,4-Dimethylphenol	-	-	45 U	280 J	44 U	210 U	41 U	39 U	337 U
2-Methylnaphthalene	-	-	52 U	5400 U	51 U	250 U	240 J	46 U	411 U
2-Methylphenol	-	-	47 U	190 J	47 U	230 U	43 U	41 U	486 U
3 & 4-Methylphenol	-	-	NA	NA	NA	NA	NA	NA	459 U
4-Methylphenol	-	-	44 U	560 J	220 J	210 U	40 U	38 U	407 J
Acenaphthene	20000	-	360 J	13000 E	680	550 J	690	440	398 U
Acenaphthylene	100000	-	1300	3300	20000 E	2100	550	150 J	1980 U
Aniline	-	-	NA	NA	NA	NA	NA	NA	955 J
Anthracene	100000	-	1500	17000 E	13000 E	910 J	1800	1300	368 U
Azobenzene/Diphenyldiazine	-	-	NA	NA	NA	NA	NA	NA	2700 U
Benzidine	-	-	NA	NA	NA	NA	NA	NA	2650 J
Benzo (a) anthracene	1000	-	6300	60000 E	73000 E	4800	5900	5100	2180 J
Benzo (a) pyrene	1000	-	6400	15000 E	19000 E	2400	5600	5200	2040 J
Benzo (b) fluoranthene	1000	-	9200 E	30000 E	62000 E	3100	7600 E	7100 E	969 J
Benzo (g,h,i) perylene	100000	-	4200	21000 E	55000 E	1600 J	4500	3900	2180 J
Benzo (k) fluoranthene	800	-	2500	7000 E	20000 E	1500 J	3000	2000	667 U
Benzoic acid	-	-	NA	NA	NA	NA	NA	NA	482 U
Benzyl alcohol	-	-	NA	NA	NA	NA	NA	NA	535 U
Bis(2-chloroisopropyl)ether	-	-	NA	NA	NA	NA	NA	NA	36200 U
Bis(2-ethylhexyl)phthalate	-	-	290 J	36 U	36 U	170 U	130 J	32 U	722 U
Carbazole	-	-	340 J	12000 E	4200	480 J	1000	220 J	2230 J
Chrysene	1000	-	6200	10000 E	34000 E	4700	6100 E	5200	480 U
Dibenzo (a,h) anthracene	330	-	1500	9300 E	23000 E	580 J	1600	1300	543 U
Dibenzofuran	-	-	250 J	8500 E	220 J	210 U	450	140 J	526 U
Di-n-butyl phthalate	-	-	180 J	140 J	130 J	170 U	110 J	95 J	653 U
Di-n-octyl phthalate	-	-	35 U	34 U	34 U	170 U	32 U	31 U	4310 U
Fluoranthene	100000	-	10000 E	44000 E	45000 E	5000	10000 E	8900 E	442 U
Fluorene	30000	-	370 J	11000 E	990	450 J	660	280 J	955 J
Indeno (1,2,3-cd) pyrene	500	-	3900	20000 E	51000 E	1400 J	4000	3400	352 U
Naphthalene	12000	-	110 J	16000 E	340 J	240 U	540	45 U	960 U
N-Nitrosodimethylamine	-	-	NA	NA	NA	NA	NA	NA	3410 U
Pentachloronitrobenzene	-	-	NA	NA	NA	NA	NA	NA	4010 U
Phenanthrene	100000	-	4500	48000 E	18000 E	3300	7300 E	5000	436 U
Phenol	33	-	46 U	350 J	130 J	220 U	42 U	81 U	5340 U
Pyrene	100000	-	9300 E	64000 E	100000 E	4200	9500 E	9100	823 U
Pyridine	-	-	NA	NA	NA	NA	NA	NA	64426 U
Total SVOCs	-	500000	68700	416260	539910	37070	71270	58825	
Herbicides (ug/kg)									
	-	-	ND	NA	NA	NA	NA	NA	ND
PCBs (ug/kg)									
Aroclor-1260	-	-	2.3 U	NA	NA	NA	NA	NA	8.78 J
Pesticides (ug/kg)									
4,4'-DDD (p,p')	3.3	13000	5.6	NA	NA	NA	NA	NA	2.49 U
4,4'-DDT (p,p')	3.3	7900	0.41 U	NA	NA	NA	NA	NA	5.81 J
alpha-Chlordane	-	4200	0.11 U	NA	NA	NA	NA	NA	2.48 P, J
Endrin aldehyde	-	-	5.2	NA	NA	NA	NA	NA	2.42 U
Endrin ketone	-	-	25	NA	NA	NA	NA	NA	2.5 U
gamma-Chlordane	-	-	0.26 U	NA	NA	NA	NA	NA	2.82 J
Total Metals (mg/kg)									
Mercury	0.18	5	NA	NA	NA	NA	1.5	0.76	NA
Arsenic	13	16	4.7	8.8	30	8.4	7.2	5.8	9.69
Lead	63	1500	830	4000	20000	690	510	230	98.7
Barium	350	1500	920	5700	4500	400	530 B	88 B	119
Cadmium	2.5	4.3	NA	NA	NA	NA	0.55	0.048 J	NA
Chromium	30	180	NA	NA	NA	NA	21	8.9	NA
Selenium	3.9	180	NA	NA	NA	NA	0.53 U	0.48 U	NA
Silver	2	180	NA	NA	NA	NA	0.053 U	0.073 BJ	NA
TLCP Metals (mg/l)									
	-	-	NA	NA	NA	NA	NA	NA	NA

NOTES:

- Track 1 Soil Cleanup Objective (SCO) corresponds to the New York State Department of Environmental Conservation (NYSDEC) 6 NYCRR Part 375 Unrestricted Use SCO.
 - Track 4 Site-Specific Soil Cleanup Objectives SSSCOs are as follows: (1) Characteristic Lead Hazardous Soils (i.e., 5 mg/L TCLP), (2) Total SVOCs at 500000 ug/kg, and (3) Metals exceeding Part 375 Commercial Use SCOs, with the exception of (a) 1,500 mg/kg for lead and barium, and (b) 5 mg/kg for mercury.
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TABLE 2
ENDPOINT SAMPLE RESULTS
LOT 1

LOCATION SAMPLING DATE LAB SAMPLE ID	TRACK 1 SOIL CLEANUP OBJECTIVE	TRACK 4 SITE-SPECIFIC SOIL CLEANUP OBJECTIVE	AOC3-3E-EW-6' 24 OCT 2011 SB38029-01	AOC3-4E-WW-6' 12 OCT 2011 SB37451-06	AOC3-3D-EB-11' 12 OCT 2011 SB37451-08	AOC3-4D-NW-6' 12 OCT 2011 SB37451-01	AOC3-3D-NW-6' 12 OCT 2011 SB37451-02	AOC3-3D-NW2-6' 11 NOV 2011 SB39456-11'	AOC3-3D-EW-6' 12 OCT 2011 SB37451-03
VOCs (ug/kg)									
Methylene chloride	50	100000	NA	16.3 O01, J	8.7 O01, J	NA	NA	NA	NA
SVOCs (ug/kg)									
Anthracene	20000	-	NA	NA	NA	NA	NA	NA	NA
Benzo (a) anthracene	1000	-	NA	NA	NA	NA	NA	NA	NA
Benzo (a) pyrene	1000	-	NA	NA	NA	NA	NA	NA	NA
Benzo (b) fluoranthene	1000	-	NA	NA	NA	NA	NA	NA	NA
Benzo (g,h,i) perylene	100000	-	NA	NA	NA	NA	NA	NA	NA
Benzo (k) fluoranthene	800	-	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	-	-	NA	NA	NA	NA	NA	NA	NA
Chrysene	1000	-	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	100000	-	NA	NA	NA	NA	NA	NA	NA
Indeno (1,2,3-cd) pyrene	500	-	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	100000	-	NA	NA	NA	NA	NA	NA	NA
Pyrene	100000	-	NA	NA	NA	NA	NA	NA	NA
Total SVOCs	-	500000	NA	NA	NA	NA	NA	NA	NA
Herbicides (ug/kg)									
	-	-	NA	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)									
	-	-	NA	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)									
4,4'-DDT (p,p')	3.3	7900	NA	6.49 J	2.36 U	NA	NA	NA	NA
Total Metals (mg/kg)									
Mercury	0.18	5	7.27 GS1	9.09 GS1	1.17 GS1	6.59 GS1	10.6 GS1	2.91 GS1	0.0127 J
Arsenic	13	16	38.4	11.7	1.5 J	7.28	11.8	5.11	8.89
Lead	63	1500	469	1110	61.6	247	593	379	614
Barium	350	400	NA	NA	NA	NA	NA	NA	NA
Cadmium	2.5	4.3	NA	NA	NA	NA	NA	NA	NA
Chromium	30	180	NA	NA	NA	NA	NA	NA	NA
Selenium	3.9	180	NA	NA	NA	NA	NA	NA	NA
Silver	2	180	NA	NA	NA	NA	NA	NA	NA
TLCP Metals (mg/l)									
Lead	-	5	0.72	0.79	0.0048 U	0.135	0.326	NA	0.343

NOTES:

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 - Only detected concentrations are presented. Track 1 SCO exceedances are shown in *italics* and Track 4 SSSCOs are bold and highlighted.
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LOCATION SAMPLING DATE LAB SAMPLE ID	TRACK 1 SOIL CLEANUP OBJECTIVE	TRACK 4 SITE-SPECIFIC SOIL CLEANUP OBJECTIVE	AOC3-3E-SW-6' 12 OCT 2011 SB37451-04	AOC3-4E-SW-6' 12 OCT 2011 SB37451-05	AOC3-4D-WW-6' 12 OCT 2011 SB37451-07	AOC3-4D-WB-11' 12 OCT 2011 SB37451-09	AOC3A-NW-6' 16 NOV 2011 SB39456-14	AOC3G-WW-6' 16 NOV 2011 SB39456-22	AOC3B-SW-6' 16 NOV 2011 SB39456-20	AOC3B-EW-6' 16 NOV 2011 SB39456-17					
VOCs (ug/kg)															
Methylene chloride	50	100000	NA	NA	NA	NA	NA	NA	NA	NA					
SVOCs (ug/kg)															
Anthracene	20000	-	NA	NA	NA	NA	NA	NA	NA	NA					
Benzo (a) anthracene	1000	-	NA	NA	NA	NA	NA	NA	NA	NA					
Benzo (a) pyrene	1000	-	NA	NA	NA	NA	NA	NA	NA	NA					
Benzo (b) fluoranthene	1000	-	NA	NA	NA	NA	NA	NA	NA	NA					
Benzo (g,h,i) perylene	100000	-	NA	NA	NA	NA	NA	NA	NA	NA					
Benzo (k) fluoranthene	800	-	NA	NA	NA	NA	NA	NA	NA	NA					
Bis(2-ethylhexyl)phthalate	-	-	NA	NA	NA	NA	NA	NA	NA	NA					
Chrysene	1000	-	NA	NA	NA	NA	NA	NA	NA	NA					
Fluoranthene	100000	-	NA	NA	NA	NA	NA	NA	NA	NA					
Indeno (1,2,3-cd) pyrene	500	-	NA	NA	NA	NA	NA	NA	NA	NA					
Phenanthrene	100000	-	NA	NA	NA	NA	NA	NA	NA	NA					
Pyrene	100000	-	NA	NA	NA	NA	NA	NA	NA	NA					
Total SVOCs	-	500000	NA	NA	NA	NA	NA	NA	NA	NA					
Herbicides (ug/kg)															
	-	-	NA	NA	NA	NA	NA	NA	NA	NA					
PCBs (ug/kg)															
	-	-	NA	NA	NA	NA	NA	NA	NA	NA					
Pesticides (ug/kg)															
4,4'-DDT (p,p')	3.3	7900	NA	NA	NA	NA	NA	NA	NA	NA					
Total Metals (mg/kg)															
Mercury	0.18	5	4.02	GS1	1.55	GS1	4.43	GS1	0.693	GS1	3.5	GS1	0.0799	2.68	GS1
Arsenic	13	16	6.05		6.81		8.99		1.44	J	7.44		10.4	2.48	7.56
Lead	63	1500	454		224		73.8		22.2	J	75.8		521	60.3	710
Barium	350	400	NA		NA		NA		NA		NA		347	237	1050
Cadmium	2.5	4.3	NA		NA		NA		NA		NA		NA	NA	NA
Chromium	30	180	NA		NA		NA		NA		NA		NA	NA	NA
Selenium	3.9	180	NA		NA		NA		NA		NA		NA	NA	NA
Silver	2	180	NA		NA		NA		NA		NA		NA	NA	NA
TLCP Metals (mg/l)															
Lead	-	5	0.404		0.115		0.0182		0.013	J	NA		NA	NA	NA

NOTES:

- Track 1 Soil Cleanup Objective (SCO) corresponds to the New York State Department of Enviro
 - Track 4 Site-Specific Soil Cleanup Objectives SSCO are as follows: (1) Characteristic Lead Haz Part 375 Commercial Use SCOs, with the exception of (a) 1,500 mg/kg for lead and barium, and (b)
 - Only detected concentrations are presented. Track 1 SCO exceedances are shown in *italics* and U = analyte not detected at or above the level indicated
- J = analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit)
 - = this indicates that no regulatory limit has been established for this analyte
 NA = Sample not analyzed for this parameter.
 ND = Compound was not detected.
 GS1 = Sample dilution required for high concentration of target analytes to be within instrument c
 O01 = Compound has is a common labroatory contaminant.
 SCO = Soil Cleanup Objective
 SSSCO = Site-Specific Soil Cleanup Objective

TABLE 2
ENDPOINT SAMPLE RESULTS
LOT 1

LOCATION SAMPLING DATE LAB SAMPLE ID	TRACK 1 SOIL CLEANUP OBJECTIVE	TRACK 4 SITE-SPECIFIC SOIL CLEANUP OBJECTIVE	3B-B-3.5' 40823 SB37050-03	3C-B-3.5' 40823 SB37050-04	4C-B-3.5' 40823 SB37050-05	DUP-1 12 OCT 2011 SB37451-10	Field Blank 12 OCT 2011 SB37451-11
VOCs (ug/kg)							
Methylene chloride	50	100000	NA	NA	NA	NA	0.7 U
SVOCs (ug/kg)							
Anthracene	20000	-	24.4 J	26.2 U	22.3 U	NA	NA
Benzo (a) anthracene	1000	-	83.6 J	44.6 J	29.1 J	NA	NA
Benzo (a) pyrene	1000	-	71 J	85.5 J	27.6 J	NA	NA
Benzo (b) fluoranthene	1000	-	66.2 J	68 J	26 J	NA	NA
Benzo (g,h,i) perylene	100000	-	30.8 U	51.8 J	29.1 U	NA	NA
Benzo (k) fluoranthene	800	-	87.7 J	70.7 J	33.5 U	NA	NA
Bis(2-ethylhexyl)phthalate	-	-	18 U	20 U	76.6 J	NA	NA
Chrysene	1000	-	79.6 J	47.3 J	26.4 J	NA	NA
Fluoranthene	100000	-	143 J	61.7 J	39.8 J	NA	NA
Indeno (1,2,3-cd) pyrene	500	-	37.1 U	43.2 J	35 U	NA	NA
Phenanthrene	100000	-	109 J	48.6 J	23.4 J	NA	NA
Pyrene	100000	-	156 J	77 J	52.1 J	NA	NA
Total SVOCs	-	500000	820.5	598.4	301	NA	NA
Herbicides (ug/kg)							
	-	-	NA	NA	NA	NA	ND
PCBs (ug/kg)							
	-	-	NA	NA	NA	NA	ND
Pesticides (ug/kg)							
4,4'-DDT (p,p')	3.3	7900	NA	NA	NA	NA	0.002 U
Total Metals (mg/kg)							
Mercury	0.18	5	4.45 GS1	4.29 GS1	1.12 GS1	3.96 GS1	NA
Arsenic	13	16	7.02	8.29	4.85	14.4	0.0032 U
Lead	63	1500	277	210	103	823	0.0045 U
Barium	350	400	163	163	94.1	NA	NA
Cadmium	2.5	4.3	0.524 J	0.644	0.465 J	NA	NA
Chromium	30	180	21	17	18.3	NA	NA
Selenium	3.9	180	0.493 J	0.677 J	0.272 J	NA	NA
Silver	2	180	0.271 U	0.292 U	0.251 U	NA	NA
TLCP Metals (mg/l)							
Lead	-	5	0.0812	0.116	0.0415	0.15	0.0048 U

NOTES:

- Track 1 Soil Cleanup Objective (SCO) corresponds to the New York State Department of Enviro
 - Track 4 Site-Specific Soil Cleanup Objectives SSSCOs are as follows: (1) Characteristic Lead Hazard Part 375 Commercial Use SCOs, with the exception of (a) 1,500 mg/kg for lead and barium, and (b)
 - Only detected concentrations are presented. Track 1 SCO exceedances are shown in *italics* and U = analyte not detected at or above the level indicated
- J = analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit)
 - = this indicates that no regulatory limit has been established for this analyte
 NA = Sample not analyzed for this parameter.
 ND = Compound was not detected.
 GS1 = Sample dilution required for high concentration of target analytes to be within instrument c:
 001 = Compound has is a common labroatory contaminant.
 SCO = Soil Cleanup Objective
 SSSCO = Site-Specific Soil Cleanup Objective

TABLE 2
ENDPOINT SAMPLE RESULTS
LOT 1

LOCATION SAMPLING DATE LAB SAMPLE ID	TRACK 1 SOIL CLEANUP OBJECTIVE	TRACK 4 SITE-SPECIFIC SOIL CLEANUP OBJECTIVE	AOC5-5F-NW-4' 1 NOV 2011 K2255-06	AOC5-5G-EW-4' 1 NOV 2011 K2255-07	AOC5-5G-WW-4' 1 NOV 2011 K2255-09	5G-WW-3' 1 NOV 2011 K2255-14	4F-B-3' 1 NOV 2011 K2255-12	AOC5-5G-SW-4' 1 NOV 2011 K2255-08	AOC5E-EW-4' 16 NOV 2011 SB39456-26	AOC5E-EWT1-4' 16 NOV 2011 SB39456-27			
VOCs (ug/kg)													
Methylene chloride	50	100000	NA	NA	NA	NA	NA	NA	39.7	J	NA		
Tetrachloroethene	1300	19000	NA	NA	NA	NA	NA	NA	192		NA		
SVOCs (ug/kg)													
4-Methylphenol	-	-	NA	NA	NA	120	J	40	U	NA	NA		
Acenaphthylene	100000	-	NA	NA	NA	76	J	160	J	NA	NA		
Anthracene	100000	-	NA	NA	NA	30	U	170	J	NA	NA		
Benzo(a)anthracene	1000	-	NA	NA	NA	130	J	600		NA	NA		
Benzo(a)pyrene	1000	-	NA	NA	NA	120	J	600		NA	NA		
Benzo(b)fluoranthene	1000	-	NA	NA	NA	240	J	850		NA	NA		
Benzo(g,h,i)perylene	1000000	-	NA	NA	NA	87	J	410		NA	NA		
Benzo(k)fluoranthene	800	-	NA	NA	NA	110	J	330	J	NA	NA		
Bis(2-ethylhexyl)phthalate	-	-	NA	NA	NA	8000	E	33	U	NA	NA		
Carbazole	-	-	NA	NA	NA	31	U	100	J	NA	NA		
Chrysene	10000	-	NA	NA	NA	190	J	630		NA	NA		
Di-n-butylphthalate	-	-	NA	NA	NA	130	J	98	J	NA	NA		
Dibenzo(a,h)anthracene	330	-	NA	NA	NA	39	U	130	J	NA	NA		
Diethylphthalate	-	-	NA	NA	NA	160	J	27	U	NA	NA		
Fluoranthene	100000	-	NA	NA	NA	340	J	1200		NA	NA		
Fluorene	30000	-	NA	NA	NA	37	U	77	J	NA	NA		
Indeno(1,2,3-cd)pyrene	500	-	NA	NA	NA	83	J	360	J	NA	NA		
Phenanthrene	100000	-	NA	NA	NA	190	J	790		NA	NA		
Pyrene	100000	-	NA	NA	NA	300	J	1100		NA	NA		
Total SVOCs	-	500000	NA	NA	NA	10276		7605		NA	NA		
Herbicides (ug/kg)													
	-	-	NA	NA	NA	NA		NA		ND	NA		
PCBs (ug/kg)													
Aroclor-1254	-	-	NA	NA	NA	ND		200		NA	8.26	U	NA
Pesticides (ug/kg)													
4,4'-DDD (p,p')	3.3	13000	NA	NA	NA	0.25	U	5.3		NA	2.71	U	NA
4,4'-DDE (p,p')	3.3	8900	NA	NA	NA	4.7		0.29	U	NA	2.16	U	NA
4,4'-DDT (p,p')	3.3	7900	NA	NA	NA	17		14		NA	3.34	U	NA
Alachlor	-	-	NA	NA	NA					NA	3.33	U	NA
Chlordane	94	4200	NA	NA	NA					NA	19.9	U	NA
delta-BHC	36	100000	NA	NA	NA	0.13	U	0.14	U	NA	2.62	U	NA
Endrin aldehyde	-	-	NA	NA	NA	5.7		0.27	U	NA	2.63	U	NA
Endrin ketone	-	-	NA	NA	NA	0.13	U	16		NA	2.72	U	NA
Total Metals (mg/kg)													
Mercury	0.18	5	NA	NA	NA	1.8		0.71		NA	NA		NA
Arsenic	13	16	NA	NA	NA	15		4.8		NA	NA		NA
Lead	63	1500	200	2300	530	570		310		280	3510		3620
Barium	350	1500	450	<i>1100</i>	620	400	B	670	B	200	2760	GS1	1510
Cadmium	2.5	4.3	NA	NA	NA	2.2		0.57		NA	NA		NA
Chromium	30	180	NA	NA	NA	22		19		NA	NA		NA
Selenium	3.9	180	NA	NA	NA	0.46	U	0.65	U	NA	NA		NA
Silver	2	180	NA	NA	NA	0.37		0.065	U	NA	NA		NA
TLCP Metals (mg/l)													
	-	-	NA	NA	NA	NA		NA		NA	NA		NA

NOTES:

- Track 1 Soil Cleanup Objective (SCO) corresponds to the New York State Department of Environmental Conservation (NYSDEC) 6 NYCRR Part 375 Unrestricted Use SCO.
 - Track 4 Site-Specific Soil Cleanup Objectives SSSCOs are as follows: (1) Characteristic Lead Hazardous Soils (i.e., 5 mg/L TCLP), (2) Total SVOCs at 500000 ug/kg, and (3) Metals exceeding Part 375 Commercial Use SCOs, with the exception of (a) 1,500 mg/kg for lead and barium, and (b) 5 mg/kg for mercury.
 - Only detected concentrations are presented. Track 1 SCO exceedances are shown in *italics* and Track 4 SSSCOs are bold and highlighted.
- U = analyte not detected at or above the level indicated
J = analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
- = this indicates that no regulatory limit has been established for this analyte
NA = Sample not analyzed for this parameter.
ND = Compound was not detected.
GS1 = Sample dilution required for high concentration of target analytes to be within instrument calibration range.
O01 = Compound has is a common laboratory contaminant.
SCO = Soil Cleanup Objective
SSSCO = Site-Specific Soil Cleanup Objective

TABLE 2
ENDPOINT SAMPLE RESULTS
LOT 1

LOCATION SAMPLING DATE LAB SAMPLE ID	TRACK 1 SOIL CLEANUP OBJECTIVE	TRACK 4 SITE-SPECIFIC SOIL CLEANUP OBJECTIVE	AOC6-5D-B-8' 16 NOV 2011 SB39456-28	AOC6-5D-WW-4' 16 NOV 2011 SB39456-29	AOC6-4D-EW-4' 16 NOV 2011 SB39456-30	DUP-A' 16 NOV 2011 SB39456-42	AOC6-4D-T1-4' 16 NOV 2011 SB39456-31	AOC6-5D-NW-4' 16 NOV 2011 SB39456-32	AOC6-5D-T1-4' 16 NOV 2011 SB39456-33
VOCS (ug/kg)									
Methylene chloride	50	100000	6.3 U	001, J	NA	NA	NA	NA	NA
SVOCs (ug/kg)									
1-Methylnaphthalene	-	-	27.4 U	559 U	31.8 U	3550 J	NA	2310 J	NA
2-Methylnaphthalene	-	-	22.1 U	450 U	25.6 U	2880 J	NA	1290 J	NA
Acenaphthene	20000	-	21.1 U	429 U	24.4 U	7890 J	NA	3010 J	NA
Acenaphthylene	100000	-	21.4 U	436 U	24.8 U	1570 J	NA	1060 J	NA
Anthracene	100000	-	22 U	639 J	25.5 U	12600	NA	5990	NA
Benzo (a) anthracene	1000	-	21.8 U	1680 J	85.4 J	29700	NA	15500	NA
Benzo (a) pyrene	1000	-	24.7 U	1320 J	64.8 J	24400	NA	11500	NA
Benzo (b) fluoranthene	1000	-	22.6 U	1190 J	57 J	22500	NA	10800	NA
Benzo (g,h,i) perylene	100000	-	28.7 U	724 J	33.3 U	11700	NA	5530	NA
Benzo (k) fluoranthene	800	-	33.1 U	1200 J	60 J	24300	NA	10600	NA
Chrysene	10000	-	22.3 U	1550 J	76.2 J	27400	NA	15500	NA
Dibenzo (a,h) anthracene	330	-	25.9 U	526 U	30 U	3720 J	NA	1760 J	NA
Dibenzofuran	-	-	29.3 U	596 U	33.9 U	3630 J	NA	1400 J	NA
Fluoranthene	100000	-	34.2 U	2540 J	127 J	56900	NA	30500	NA
Fluorene	30000	-	23.8 U	485 U	27.6 U	7560 J	NA	3250 J	NA
Indeno (1,2,3-cd) pyrene	500	-	34.6 U	704 U	40.1 U	11500	NA	5400	NA
Naphthalene	12000	-	18.9 U	386 U	22 U	7220 J	NA	1640 J	NA
Phenanthrene	100000	-	21.1 U	2780 J	123 J	69200	NA	40600	NA
Pyrene	100000	-	37.6 U	3870	183 J	67200	NA	38800	NA
Total SVOCs	-	500000	ND	17493	776	395420	NA	206440	NA
Herbicides (ug/kg)									
	-	-	ND	NA	NA	NA	NA	NA	NA
PCBs (ug/kg)									
	-	-	ND	NA	NA	NA	NA	NA	NA
Pesticides (ug/kg)									
	-	-	ND	NA	NA	NA	NA	NA	NA
Total Metals (mg/kg)									
Mercury	0.18	5	0.0431	16.8 GS1	3.9 GS1	11.2 GS1	9.44 GS1	7.57 GS1	0.798 GS1
Arsenic	13	16	NA	NA	NA	NA	NA	NA	NA
Lead	63	1500	19.4	676	212	1460	NA	3860	409
Barium	350	1500	41.9	375	245	853	NA	3060 GS1	367
TLCP Metals (mg/l)									
Lead	-	-	NA	NA	NA	NA	NA	NA	NA

NOTES:

- Track 1 Soil Cleanup Objective (SCO) corresponds to the New York State Department of Environmental Conservation (NYSDEC) 6 NYCRR Part 375 Unrestricted Use SCO.
 - Track 4 Site-Specific Soil Cleanup Objectives SSSCOs are as follows: (1) Characteristic Lead Hazardous Soils (i.e., 5 mg/L TCLP), (2) Total SVOCs at 500000 ug/kg, and (3) Metals exceeding Part 375 Commercial Use SCOs, with the exception of (a) 1,500 mg/kg for lead and barium, and (b) 5 mg/kg for mercury.
 - Only detected concentrations are presented. Track 1 SCO exceedances are shown in *italics* and Track 4 SSSCOs are bold and highlighted.
- U = analyte not detected at or above the level indicated
J = analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit) - data is estimated
- = this indicates that no regulatory limit has been established for this analyte
NA = Sample not analyzed for this parameter.
ND = Compound was not detected.
GS1 = Sample dilution required for high concentration of target analytes to be within instrument calibration range.
001 = Compound has is a common laboratory contaminant.
SCO = Soil Cleanup Objective
SSSCO = Site-Specific Soil Cleanup Objective

TABLE 2
ENDPOINT SAMPLE RESULTS
LOT 1

Client ID Lab Sample ID Date Sampled	TRACK 1 SOIL CLEANUP OBJECTIVE	TRACK 4 SITE SPECIFIC SOIL CLEANUP OBJECTIVE	3B-B-3.5' SB37050-03 7-Oct-11	3C-B-3.5' SB37050-04 7-Oct-11	4C-B-3.5' SB37050-05 7-Oct-11	AOC3A-NW-6' SB39456-14 7-Oct-11	AOC111 SB39456-35 16-Nov-11	AOC11-1B-B2-9' SB38029-02 24-Oct-11	AOC11-1B-B-6' SB37050-01 7-Oct-11	AOC11-1B-WW-3' SB37050-02 7-Oct-11
Metals (mg/kg)										
Arsenic	13	16	7.02	8.29	4.85	7.44	NA	NA	NA	NA
Barium	350	1,500	163	163	94.1	NA	NA	NA	NA	NA
Mercury	0.18	5	4.45	4.29	1.12	0.638	NA	NA	NA	NA
Lead	63	1,500	277	210	103	75.8	NA	2.28	1,110	134
SVOCs (µg/kg)										
1-Methylnaphthalene	-	-	29.5 U	32.7 U	27.8 U	NA	302 J	29.3 U	340 J	267 U
2-Methylnaphthalene	-	-	23.7 U	26.3 U	22.4 U	NA	NA	23.6 U	240 J	215 U
Acenaphthene	20,000	-	22.6 U	25.1 U	21.4 U	NA	1,190 J	22.5 U	841 J	402 J
Acenaphthylene	100,000	-	23 U	25.5 U	21.7 U	NA	616 J	22.9 U	392 J	295 J
Anthracene	100,000	-	24.4 J	26.2 U	22.3 U	NA	2,980	23.5 U	2,230	888 J
Benzo (a) anthracene	1,000	-	83.6 J	44.6 J	29.1 J	NA	12,100	23.3 U	6,270	2,740
Benzo (a) pyrene	1,000	-	71 J	85.5 J	27.6 J	NA	10,500	26.4 U	4,840	2,240
Benzo (b) fluoranthene	1,000	-	66.2 J	68 J	26 J	NA	11,600	35.4 U	3,940	1,800 J
Benzo (g,h,i) perylene	100,000	-	30.8 U	51.8 J	29.1 U	NA	4,670	30.6 U	1,680 J	1,000 J
Benzo (k) fluoranthene	800	-	87.7 J	70.7 J	33.5 U	NA	6,770	35.4 U	5,770	2,400
Bis(2-ethylhexyl)phthalate	-	-	18 U	20 U	76.6 J	NA	177 U	18.9 U	178 U	164 U
Chrysene	1,000	-	79.6 J	47.3 J	26.4 J	NA	11,700	23.9 U	6,050	2,490
Dibenzo (a,h) anthracene	330	-	27.8 U	30.8 U	26.2 U	NA	1,410 J	27.6 U	484 J	313 J
Dibenzofuran	-	-	31.4 U	34.8 U	29.6 U	NA	442 J	31.2 U	468 J	285 U
Fluoranthene	100,000	-	143 J	61.7 J	39.8 J	NA	20,600	36.6 U	10,600	4,280
Fluorene	30,000	-	25.6 U	28.4 U	24.1 U	NA	1,020 J	25.4 U	821 J	376 J
Indeno (1,2,3-cd) pyrene	500	-	37.1 U	43.2 J	35 U	NA	4,650	36.9 U	1,620 J	906 J
Naphthalene	12,000	-	20.3 U	22.6 U	19.2 U	NA	189 U	20.2 U	404 J	185 U
Phenanthrene	100,000	-	109 J	48.6 J	23.4 J	NA	16,000	22.5 U	9,740	3,220
Pyrene	100,000	-	156 J	77 J	52.1 J	NA	27,700	40.2 U	12,600	5,000
Total SVOCs	-	500,000	820.5 J	598.4 J	301 J	NA	134,250	ND	69330 J	28350 J

Notes:

- Track 1 Soil Cleanup Objective (SCO) corresponds to the New York State Department of Environmental Conservation (NYSDEC) 6 NYCRR Part 375 Unrestricted Use SCO.
- Track 4 Site-Specific Soil Cleanup Objectives SSCO are as follows: (1) Total SVOCs at 500000 µg/kg, and (2) Metals exceeding Part 375 Commercial Use SCOs, with the exception of (a) 1,500 mg/kg for lead and barium, and (b) 5 mg/kg for mercury.
- Only detected concentrations are presented. Track 1 SCO exceedances are shown in italics and Track 4 SSSCOs are bold and highlighted.
- TCLP = Toxicity Characteristic Leaching Procedure
- mg/kg = milligrams per kilogram
- µg/kg = micrograms per kilogram
- mg/l = milligrams per liter
- “-” = no criteria
- NA = Not Analyzed
- ND = Not Detected
- SCO = Soil Cleanup Objective
- SSSCO = Site-Specific Soil Cleanup Objective

Qualifiers:

- J = analyte detected at or above the MDL (method detection limit) but below the RL (Reporting Limit). Result is an estimated concentration
U = analyte not detected at or above the level indicated
GS1 = Sample dilution required for high concentration of target analytes to be within instrument calibration range.

Table 3
Former Pfizer Property
Site B Operable Unit 2
Block 2266 Lot 52
Remaining Parameters in Soil Above Soil Cleanup Objectives

COMPOUND	NYSDEC Part 375.6 Unrestricted Use Soil Cleanup Objectives*	NYSDEC Part 375.6 Restricted Residential Soil Cleanup Objectives*	Range in Exceedances	Frequency of Detection	SBB-04	SBB-04	SBB-29	SBB-29	SBB-29	SBB-30	SBB-30	SBB-30
					3/12/1996	4/21/1997	3/29/2004	3/29/2004	3/29/2004	3/29/2004	3/29/2004	3/29/2004
					(6-8')	(0-2')	(0-2")	(2-24")	(60-84")	(0-2")	(2-24")	(60-84")
<i>SVOC: Sample Results in µg/kg</i>												
Benzo(a)anthracene	1,000	1,000	1,700 - 75,000	4	-	-	75,000	3,000	1,700	-	3,200	-
Benzo(a)pyrene	1,000	1,000	1,500 - 54,000	4	-	-	54,000 A	3,400	1,500	-	3,000 A	-
Benzo(b)fluoranthene	1,000	1,000	1,000 - 69,000	4	-	-	69,000 A	5,100	1,000 M	-	2,500 M	-
Benzo(k)fluoranthene	800	3,900	2,800	1	-	-	-	-	-	-	2,800	-
Chrysene	1,000	3,900	1,700 - 71,000	4	-	-	71,000 A	4,800	1,700	-	4,200 A	-
Dibenzo(a,h)anthracene	330	330	330 - 25,000	4	-	-	25,000 H	1,300 M	330 J	-	510	-
Dibenzofuran	7,000	59,000	8,600	1	-	-	8,600 J	-	-	-	-	-
Flouranthene	100,000	100,000	120,000	1	-	-	120,000 A	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	500	500	43,000	1	-	-	43,000	-	-	-	-	-
Phenanthrene	100,000	100,000	130,000	1	-	-	130,000 A	-	-	-	-	-
Pyrene	100,000	100,000	170,000	1	-	-	170,000	-	-	-	-	-
<i>Metals: Sample Results in mg/Kg</i>												
Arsenic	13	16	49.7 - 307	2	-	-	307	49.7	-	-	-	-
Barium	350	350	868 - 1250	3	-	-	1250	868	-	1200	-	-
Lead	63	400	631 - 1770	3	-	-	1770 *	1530 *	631 *	-	-	-
Mercury	0.18	0.81	0.47 - 3.5	6	1.3	9.2	1.9	2	3.5	0.47	1.8	3.3
Selenium	3.9	36	4.7	1	-	-	-	4.7 B	-	-	-	-

Notes:

RL - Laboratory Reporting Limit

Bold/highlighted- Indicated exceedance of the NYSDEC UUSCO Guidance Value

Bold/highlighted- Indicated exceedance of the NYSDEC RRSCO Guidance Value

A - Concentration exceeds the instrument calibration range or below the reporting limit

B - Compound detected in laboratory blank

J - Estimated Value

H - Alternate peak selection upon analytical review

M - Manually integrated compound

* - Duplicate analysis not within control limits

Table 4
 Former Pfizer Property Site B - Operable Unit 2
 177 Harrison Avenue, Brooklyn, New York
 Block 2266 Lot 52 Sample Parameters in Groundwater Above Groundwater Quality Standards

COMPOUND	NYSDEC Ambient Water Quality Standards (AWQS)	MW-7 DL	MW-7	MW15	MW15
		2/18/2004	4/12/2004	9/2014	8/2015
<i>VOCs: Sample Results in µg/kg</i>					
Benzene	1	4	52	-	-
cis-1,2-Dichloroethene	5	6	1100 A	-	42
Tetrachloroethene	5	-	10	-	-
Trichloroethene	5	7	39 J	-	-
Vinyl Chloride	2	8 J	11	2.4	2.4

Notes:

* - 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives

RL - Laboratory Reporting Limit

Bold/highlighted- Indicated exceedance of the NYSDEC Groundwater Standard

A - Concentration exceeds the instrument calibration range or below the reporting limit

J - Estimated Value

Table 5A – Composite Cover Remedial System Monitoring Requirements and Schedule

Cover Component	Monitoring Parameter	Monitoring Schedule
Lot 1 - 10-inch-thick concrete building slab	Inspect for penetrations, holes, cracks, etc. & determine if repair/replacement is required	Annual
Lot 1 - 2 inch asphalt and 4 inch concrete walkways	Inspect for damage, and determine if repair/replacement is required.	Annual
Asphalt Pavement (2 inches thick)	Inspect for damage, and determine if repair/replacement is required.	Quarterly

Table 5B – SSDS Remedial System Monitoring Requirements and Schedule

Remedial System Component	Monitoring Parameter	Operating Range	Monitoring Schedule
Vacuum Fan	On or Off		Annually
Magnehelic Meter	Vacuum at Riser	>0.1”W.C.	Annually
Alarm	Alarm trips when fan shut off		Annually

Table 6. Schedule of Interim Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Site wide Inspection Report	Annually
Cover Inspection - Lot 1	Annually
Cover Inspection - Lot 52	Quarterly
SSD System Inspection	Annually
Periodic Review Report	Annually, or as otherwise determined by the Department

* The frequency of events will be conducted as specified until otherwise approved by the NYSDEC.

FIGURES

73°58.000' W

73°57.000' W

73°56.000' W

WGS84 73°55.000' W

40°43.000' N

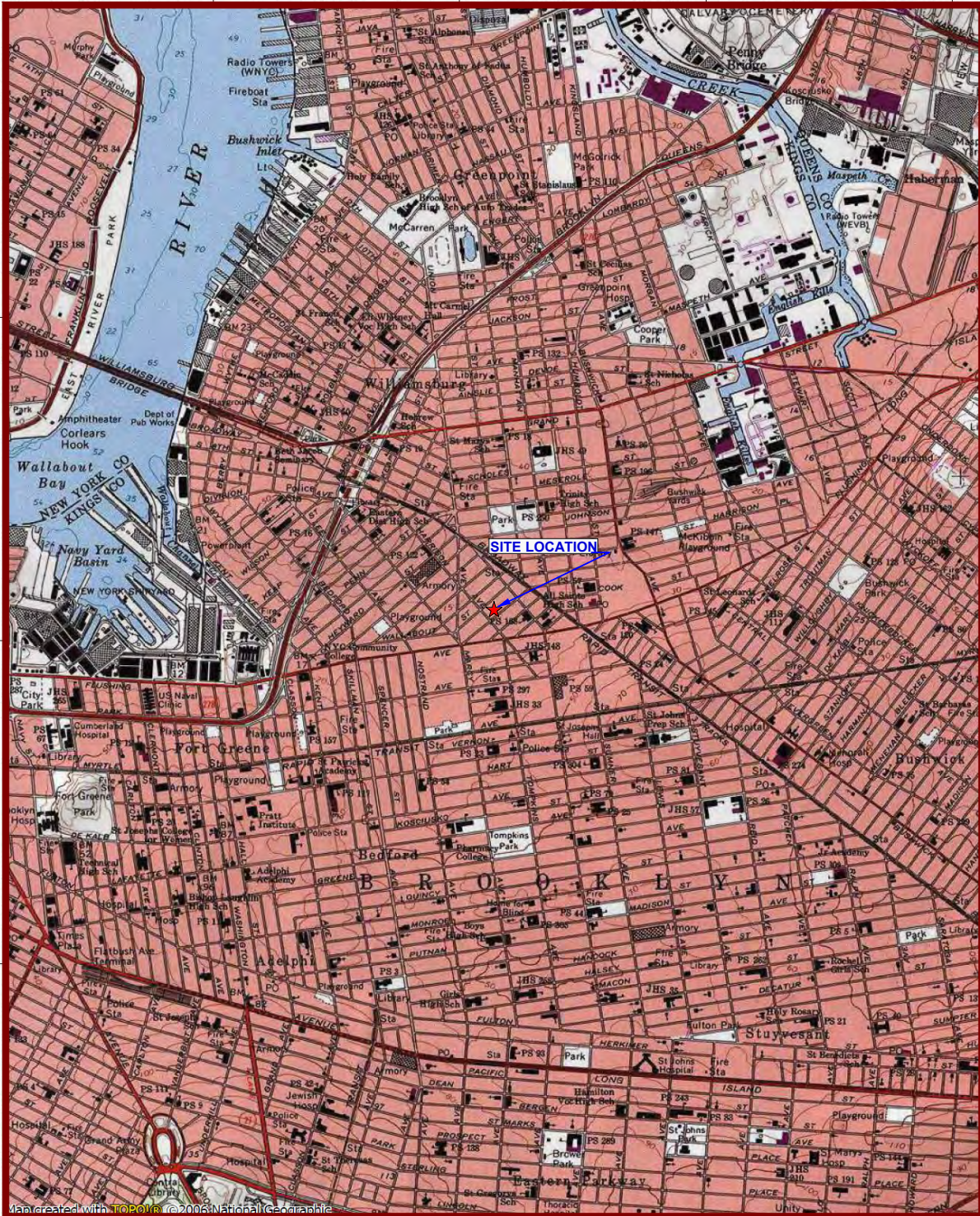
40°43.000' N

40°42.000' N

40°42.000' N

40°41.000' N

40°41.000' N



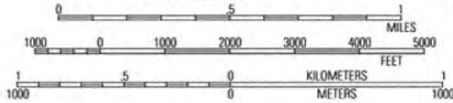
73°58.000' W

73°57.000' W

73°56.000' W

WGS84 73°55.000' W

Map created with TOPOLOGIC © 2006 National Geographic



MN * TN
13°
02/06/18

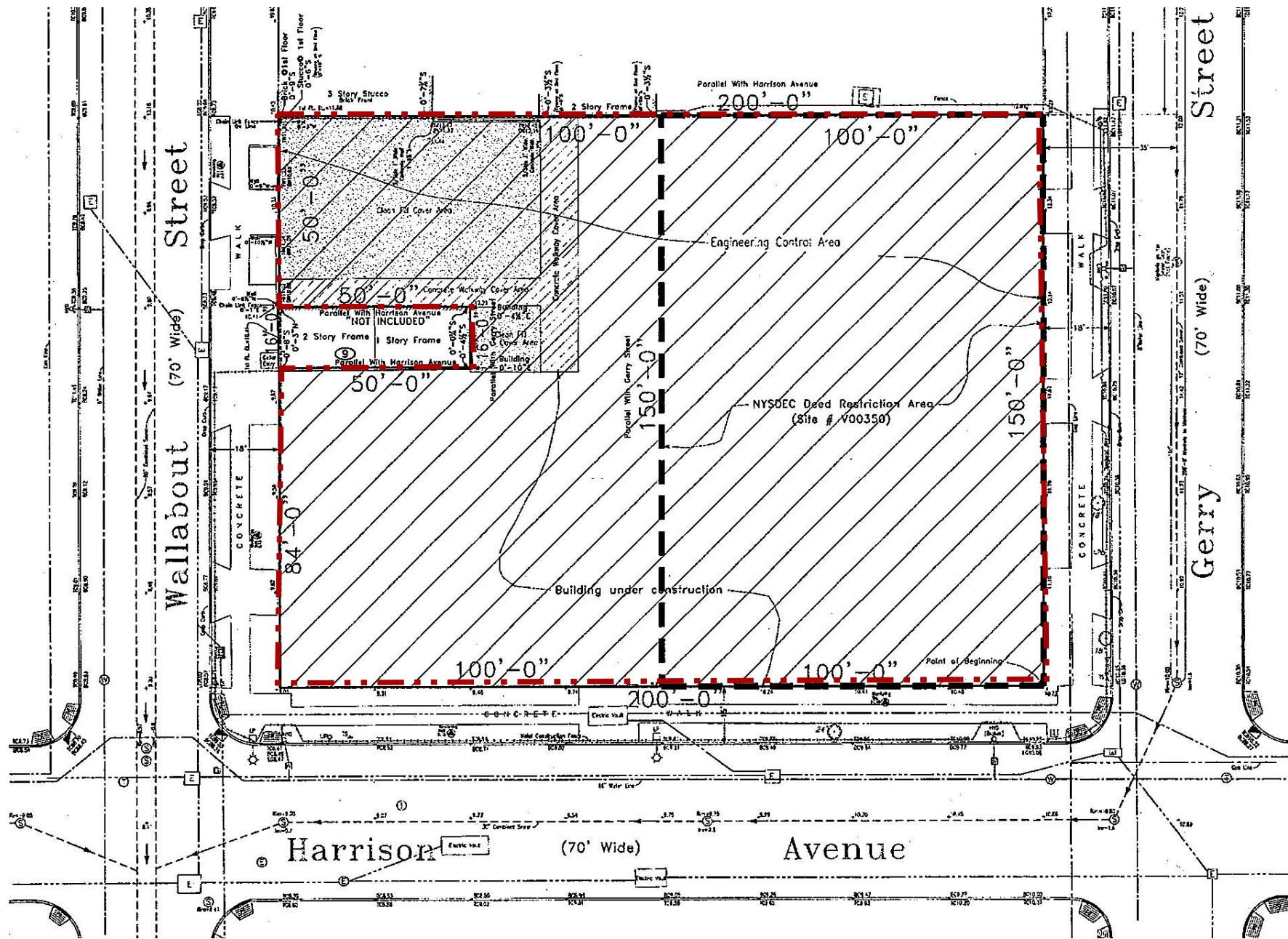
USGS Brooklyn Quadrangle 1995, Contour Interval = 10 feet

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS

Phone 631.504.6000
Fax 631.924.2870

FORMER PFIZER PROPERTY SITE B - OPERABLE UNIT 2
BLOCK 2260 LOT 52, 177 HARRISON AVENUE, BROOKLYN, NY

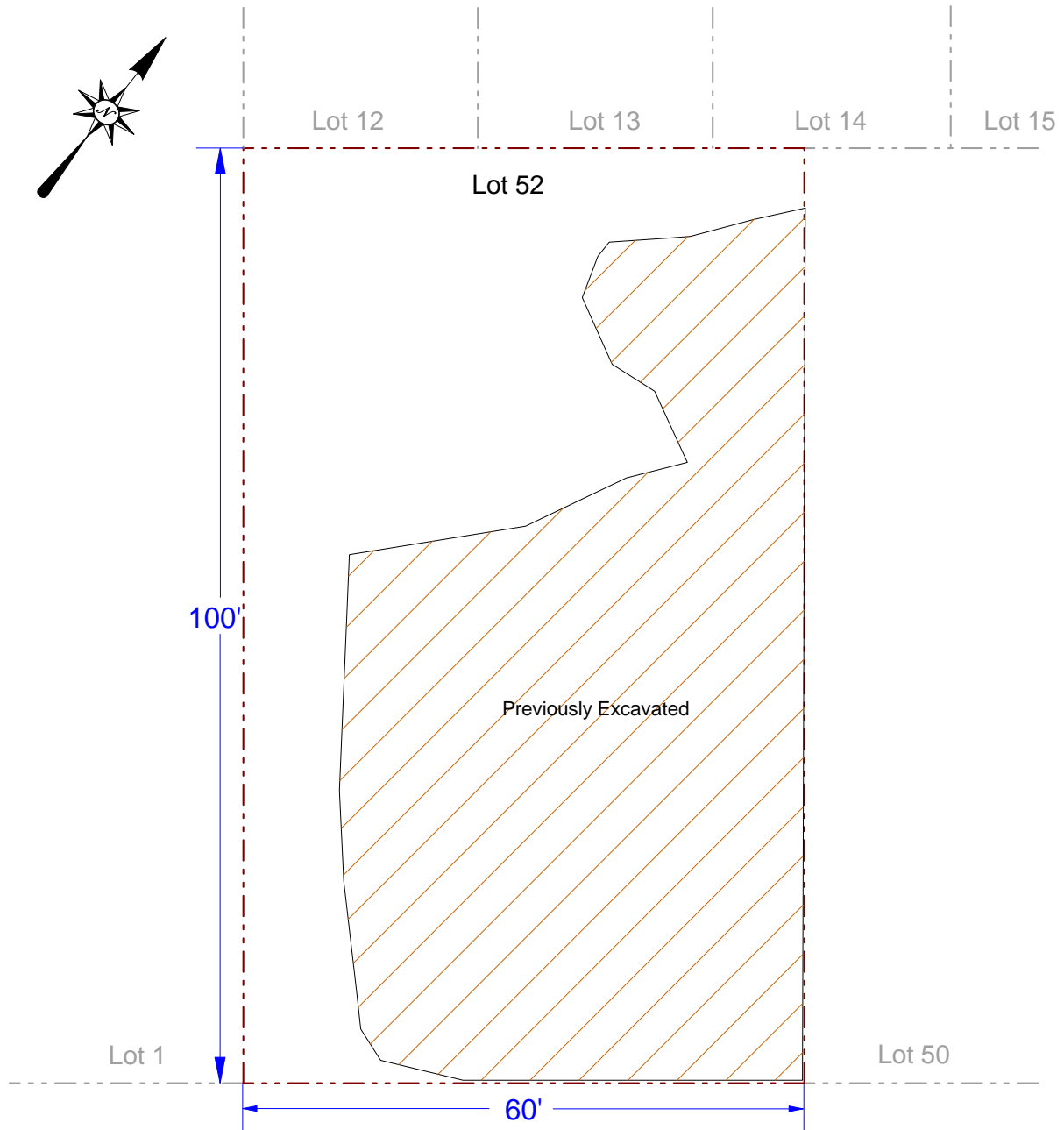
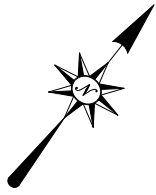
FIGURE 1 SITE LOCATION MAP



AMC Engineering
 1836 42nd Street
 Astoria, NY 11105

Figure No.
2A

Site Name: **FORMER PFIZER PROPERTY - SITE B**
 Site Address: **177 HARRISON AVENUE, BROOKLYN, NY**
 Drawing Title: **SITE PLAN - LOT 1**



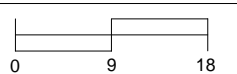
SIDEWALK

GERRY STREET

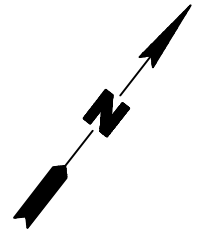
Key

 Property Boundary

Scale

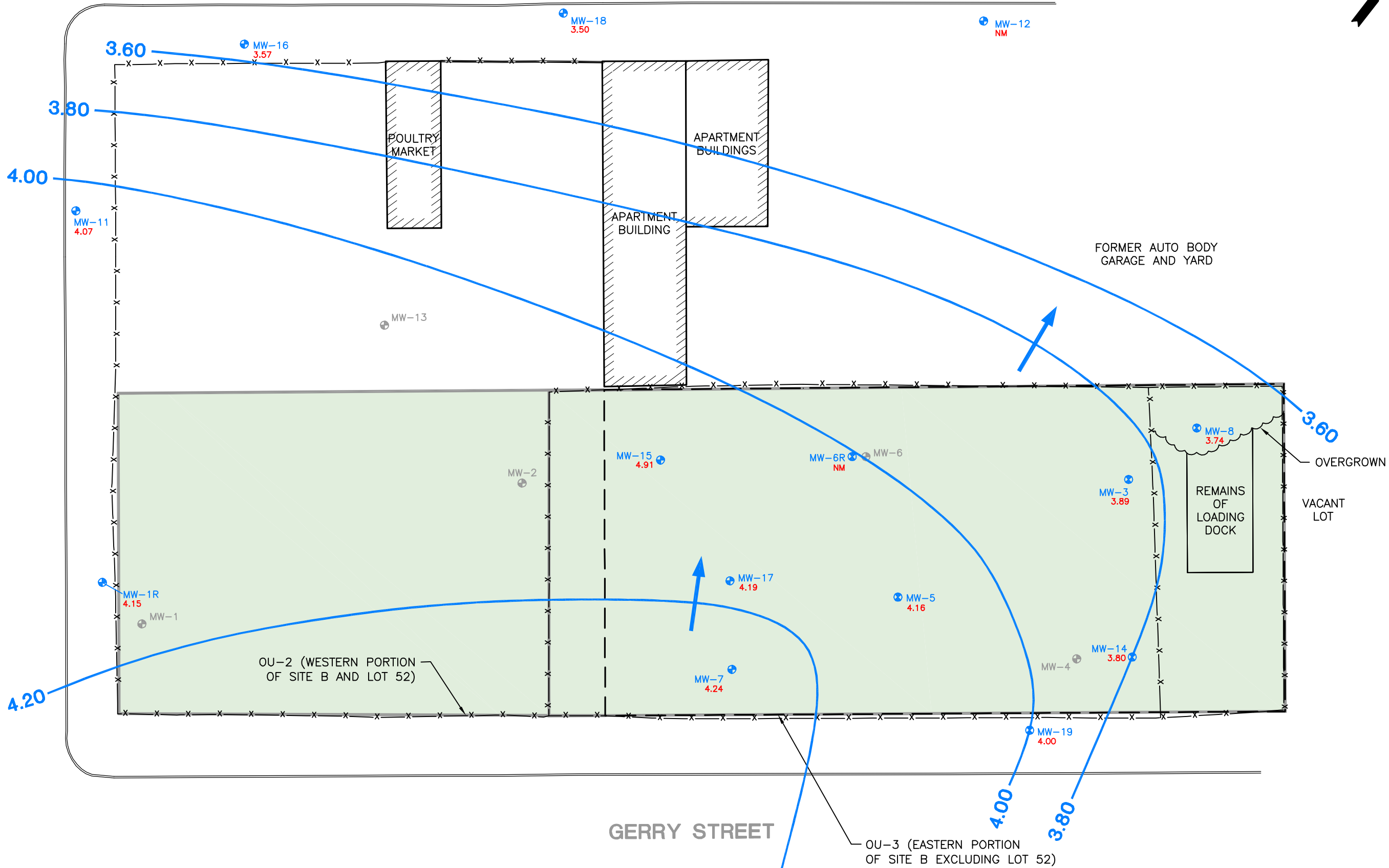


Scale: 1 inch = 18 feet

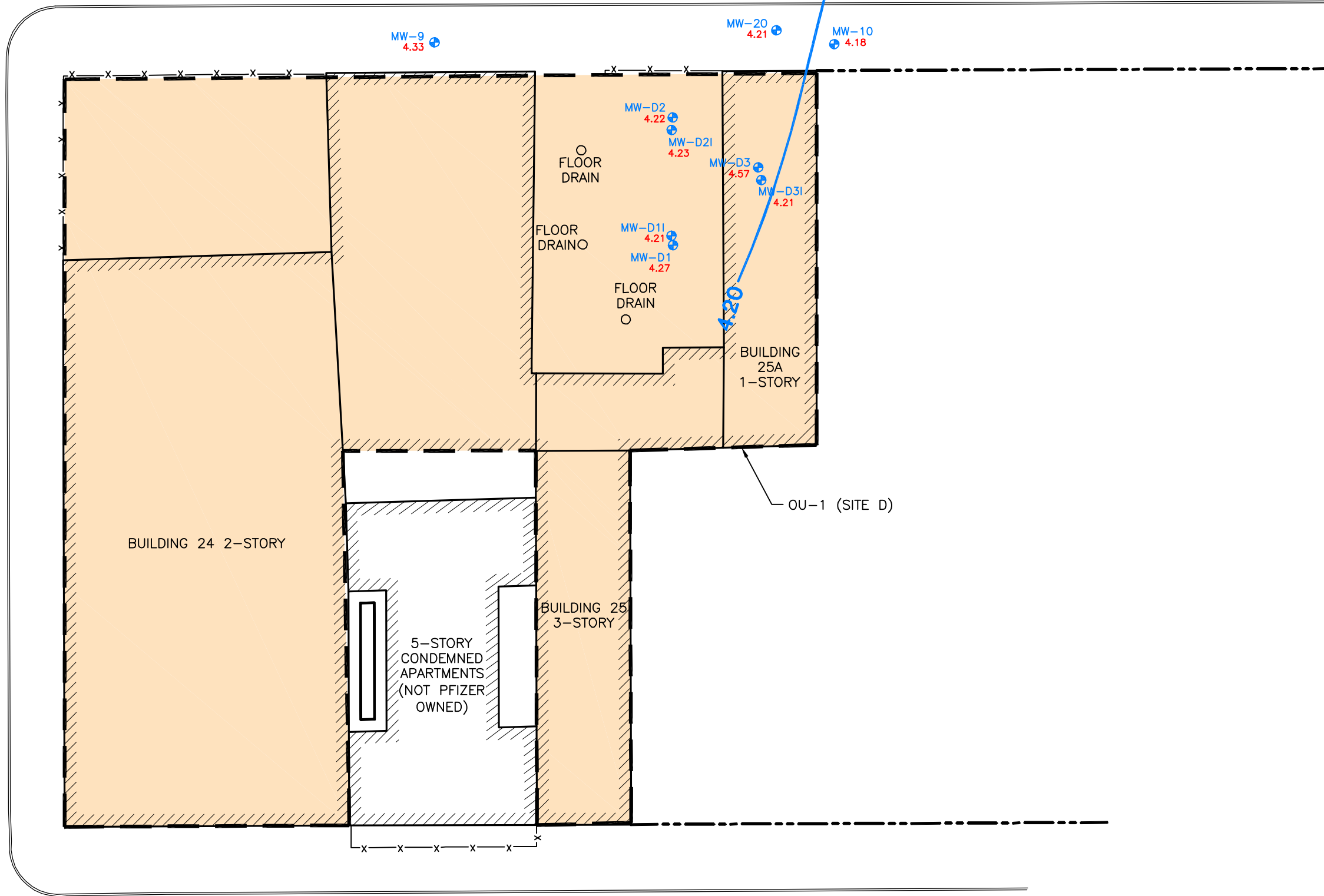


WALLABOUT STREET

HARRISON AVENUE



GERRY STREET



BARTLETT STREET

LEGEND

- EXISTING BUILDINGS OR STRUCTURES
- MW-1R LOCATION AND DESIGNATION OF EXISTING MONITORING WELL
- MW-4 LOCATION AND DESIGNATION OF DESTROYED MONITORING WELL
- SITE D (FORMER ARLINGTON PRESS)
- SITE B
- FORMER PFIZER PROPERTY LINE
- FENCE
- 4.16 WATER-LEVEL ELEVATION IN FEET RELATIVE TO BOROUGH OF BROOKLYN HIGHWAY DATUM
- NM NOT MEASURED
- 3.80 LINE OF EQUAL WATER-LEVEL ELEVATION IN FEET RELATIVE TO BOROUGH OF BROOKLYN HIGHWAY DATUM
- ESTIMATED GROUNDWATER FLOW DIRECTION

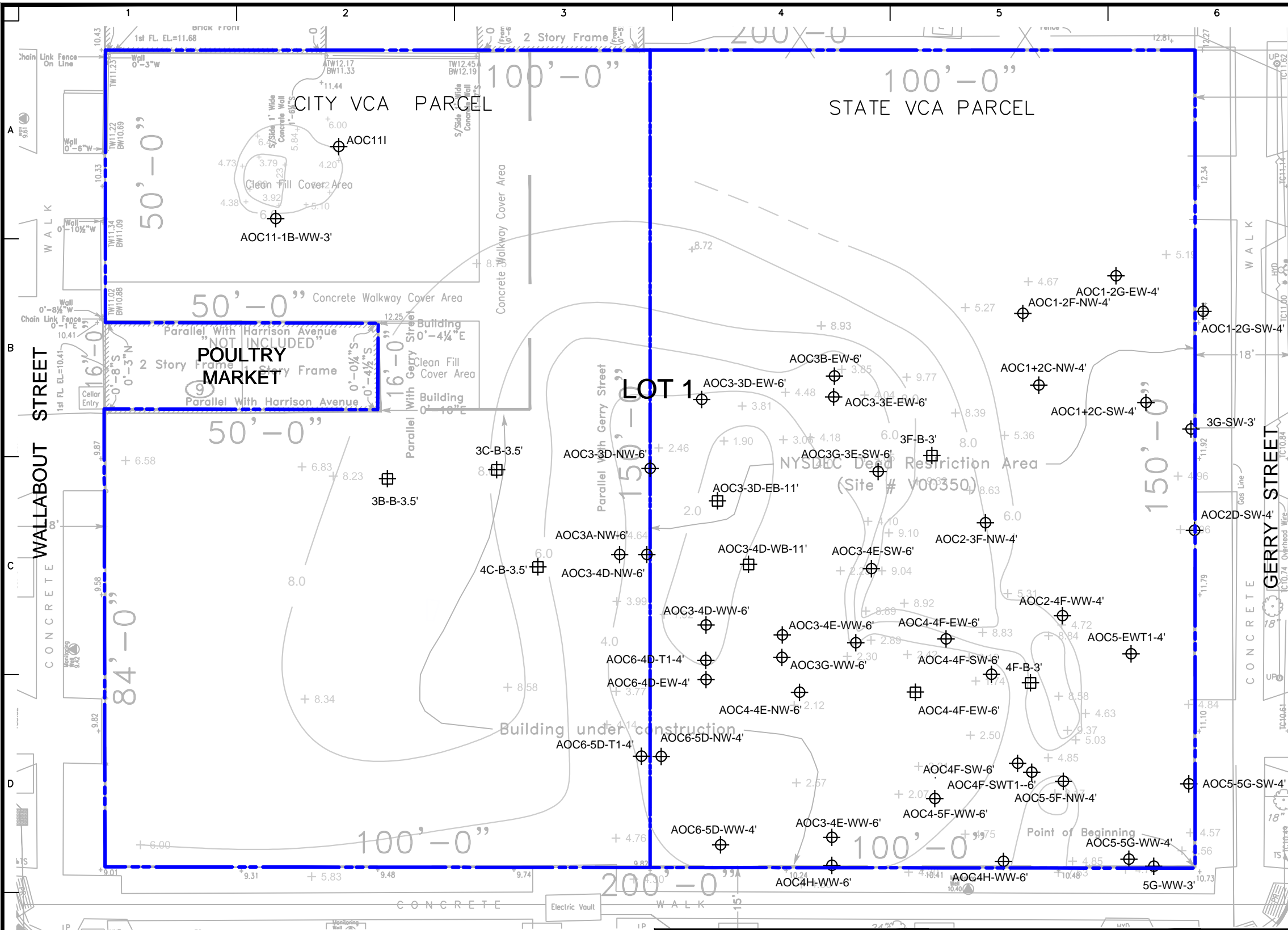
NOTE

WATER-LEVEL ELEVATION AT MW-15 WAS LIKELY AN ERRONEOUS MEASUREMENT, AND MW-D3 IS LIKELY AFFECTED BY PERCHED GROUNDWATER. BOTH WERE EXCLUDED FROM DATA USED TO DETERMINE GROUNDWATER ELEVATION CONTOURS.



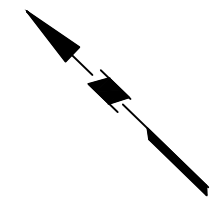
Title: GROUNDWATER FLOW DIRECTION MARCH 17, 2014			
GROUNDWATER REMEDIATION PROGRESS REPORT NO. 46			
Prepared For:		PFIZER INC BROOKLYN, NEW YORK	
	Compiled by: W.K.	Date: 02JUN14	
ROUX ASSOCIATES, INC. <i>Environmental Consulting and Management</i>	Prepared by: J.A.D.	Scale: AS SHOWN	
	Project Mgr: W.K.	Project: 0047.0044Y040	
	File: 0047.0044Y610.01.DWG		

FIGURE 3



- LEGEND:**
- SITE BOUNDARY
 - ⊕ SIDEWALL ENDPOINT SAMPLE EXCEEDING TRACK 1 SCOs
 - ⊞ BOTTOM ENDPOINT SAMPLE EXCEEDING TRACK 1 SCOs
 - SURVEYED POST-EXCAVATION AREAS AND ELEVATIONS (DECEMBER 2011)

- NOTES:**
1. BASE PLAN OBTAINED FROM SURVEY BY ERLANDSEN-CROWELL & SHAW, DATED MAY 1, 2014.
 2. SAMPLES WITH TRACK 1 EXCEEDANCES ARE SHOWN ON FIGURE.
 3. AOC = AREA OF CONCERN
 4. SCO = SOIL CLEANUP OBJECTIVES
 5. VCA = VOLUNTARY CLEANUP AGREEMENT

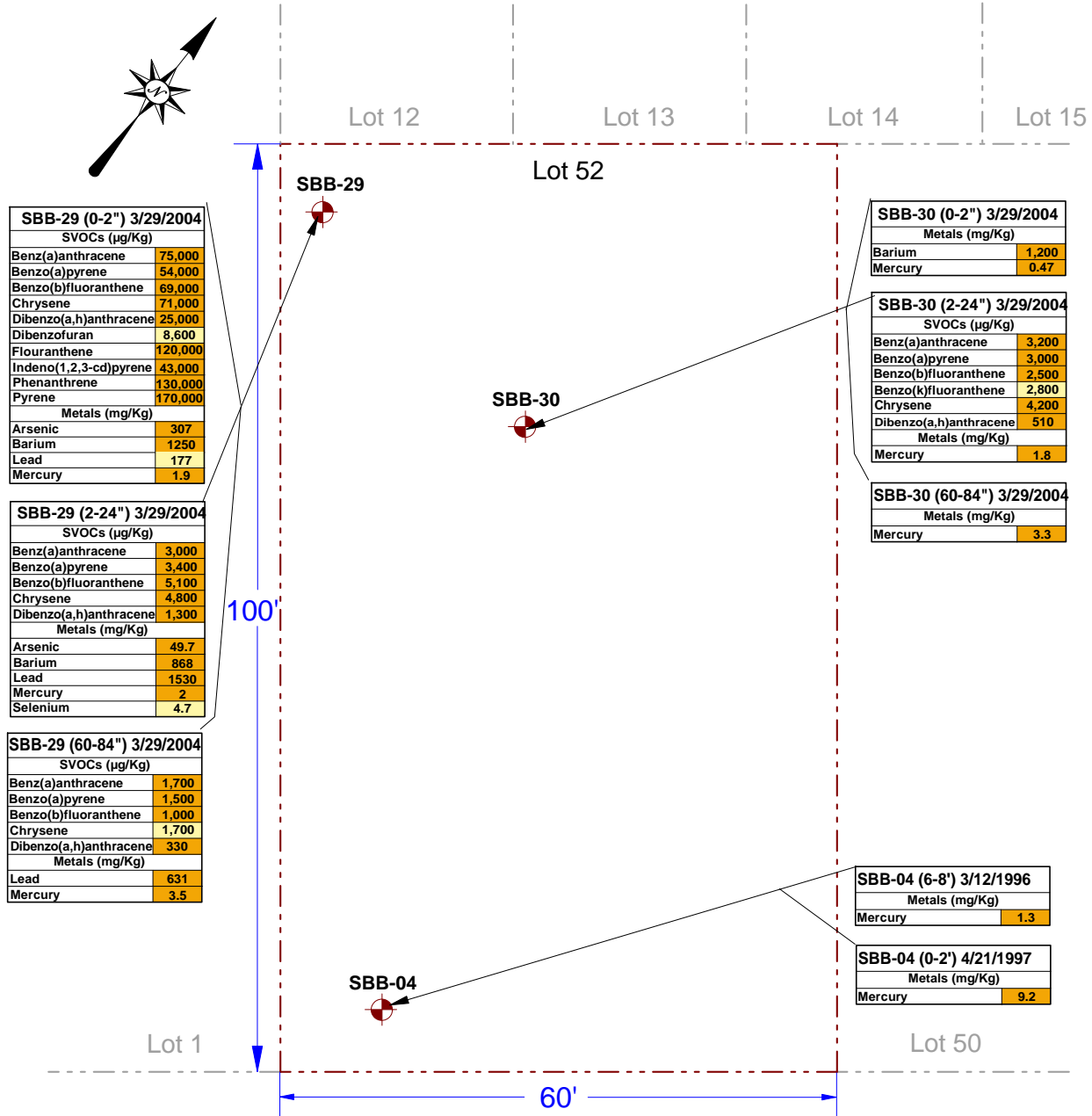
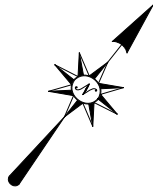


LANGAN
 21 Penn Plaza, 360 West 31st Street, 8th Floor
 New York, NY 10001
 T: 212.479.5400 F: 212.479.5444 www.langan.com
 Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
 Langan Engineering and Environmental Services, Inc.
 Langan CT, Inc.
 Langan International LLC
 Collectively known as Langan

Project
177 HARRISON AVENUE
 BLOCK No. 2266, LOT No. 1
 BROOKLYN NEW YORK

Figure Title
ENDPOINT SAMPLES EXCEEDING TRACK 1 SCOs

Project No. 170091701	Figure No.
Date 07/29/2014	4
Scale 1"=20'	
Drawn By JPA	Checked By SK
Submission Date	
Sheet 7 of 7	

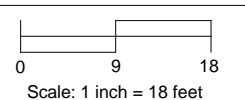


SIDEWALK
GERRY STREET

Key

Property Boundary

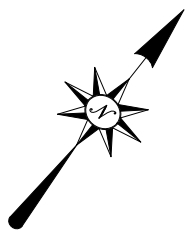
Scale



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Figure No.
5

Site Name: **FORMER PFIZER PROPERTY SITE B - OPERABLE UNIT 2**
 Site Address: **BLOCK 2266 LOT 52 177 HARRISON AVENUE, BROOKLYN, NY**
 Drawing Title: **REMAINING SOIL EXCEEDENCE MAP**



Lot 12

Lot 13

Lot 14

Lot 15

Lot 52

MW-15

MW-15 9/2014	
VOCs (µg/L)	
Vinyl Chloride	2.4
MW-15 8/2015	
VOCs (µg/L)	
cis-1,2-Dichloroethene	42
Vinyl Chloride	2.4

100'

MW-7

MW-7 2/18/2004	
VOCs (µg/L)	
Benzene	4
cis-1,2-Dichloroethene	6
Trichloroethene	39
Vinyl Chloride	11
MW-7 4/12/2004	
VOCs (µg/L)	
Benzene	52
cis-1,2-Dichloroethene	1100
Tetrachloroethene	10
Trichloroethene	39
Vinyl Chloride	11
MW-7 2/2012	
VOCs (µg/L)	
cis-1,2-Dichloroethene	66
Tetrachloroethene	5
Trichloroethene	6.7
Vinyl Chloride	2.7
MW-7 9/2012	
VOCs (µg/L)	
cis-1,2-Dichloroethene	515
Tetrachloroethene	17.5
Trichloroethene	29.5
Vinyl Chloride	18.1

60'

Lot 1

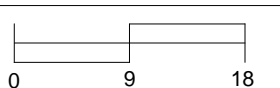
DEWALK

ERRY STREET

Key

Property Boundary

Scale



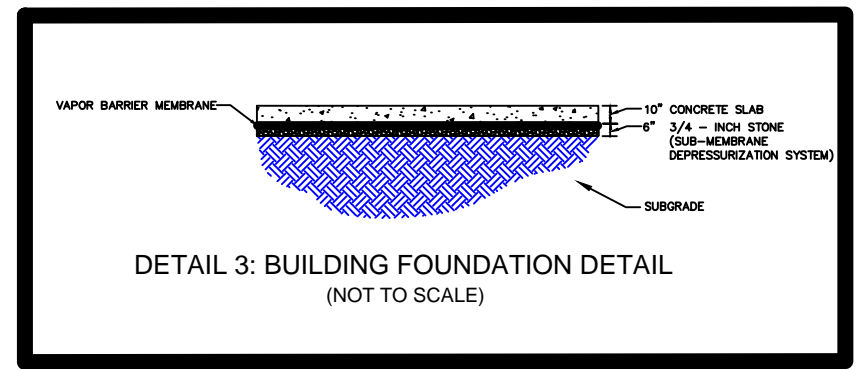
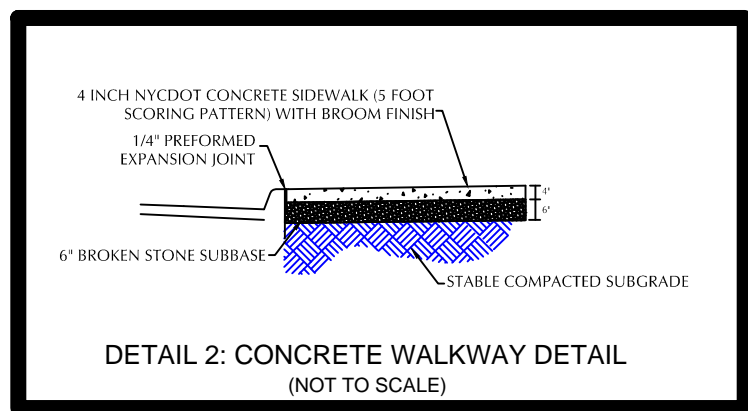
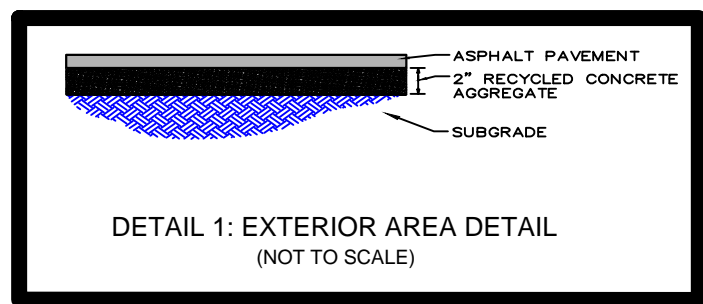
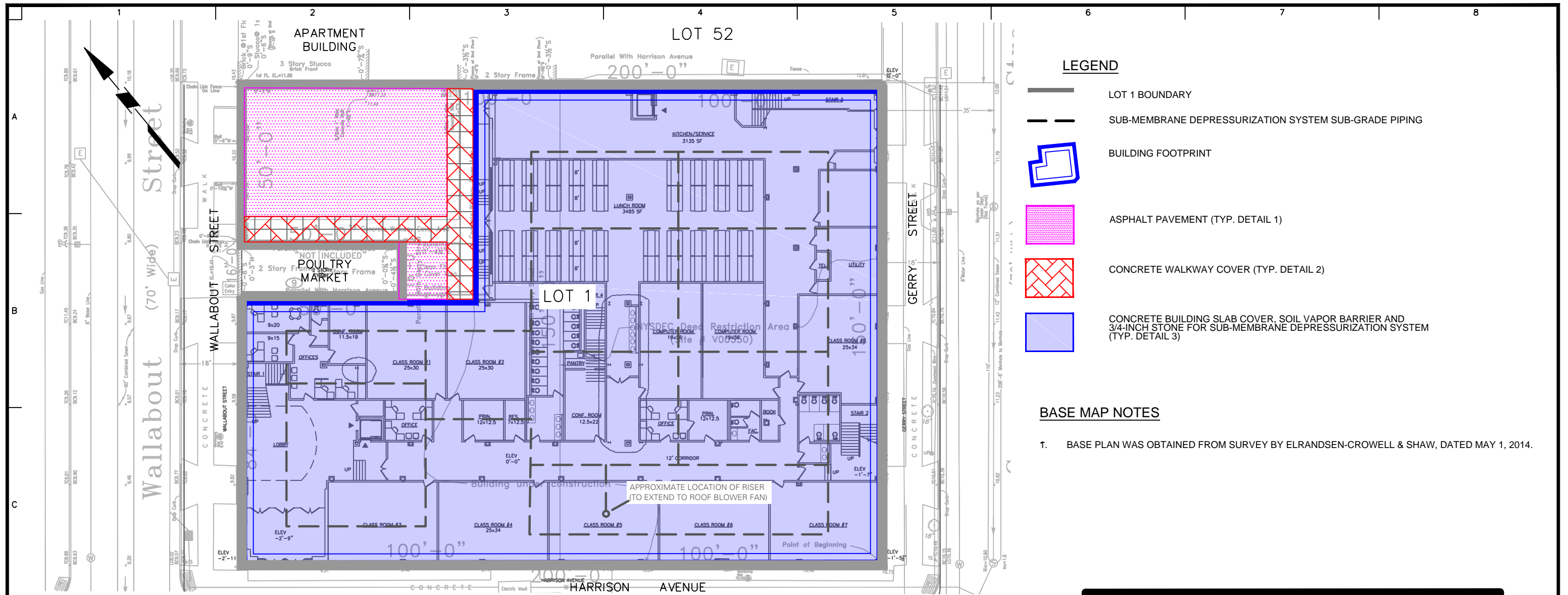
Scale: 1 inch = 18 feet



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Astoria, NY 11105

Figure No.
6

Site Name: **FORMER PFIZER PROPERTY SITE B - OPERABLE UNIT 2**
Site Address: **BLOCK 2266 LOT 52 177 HARRISON AVENUE, BROOKLYN, NY**
Drawing Title: **REMAINING GROUNDWATER EXCEEDENCE MAP**

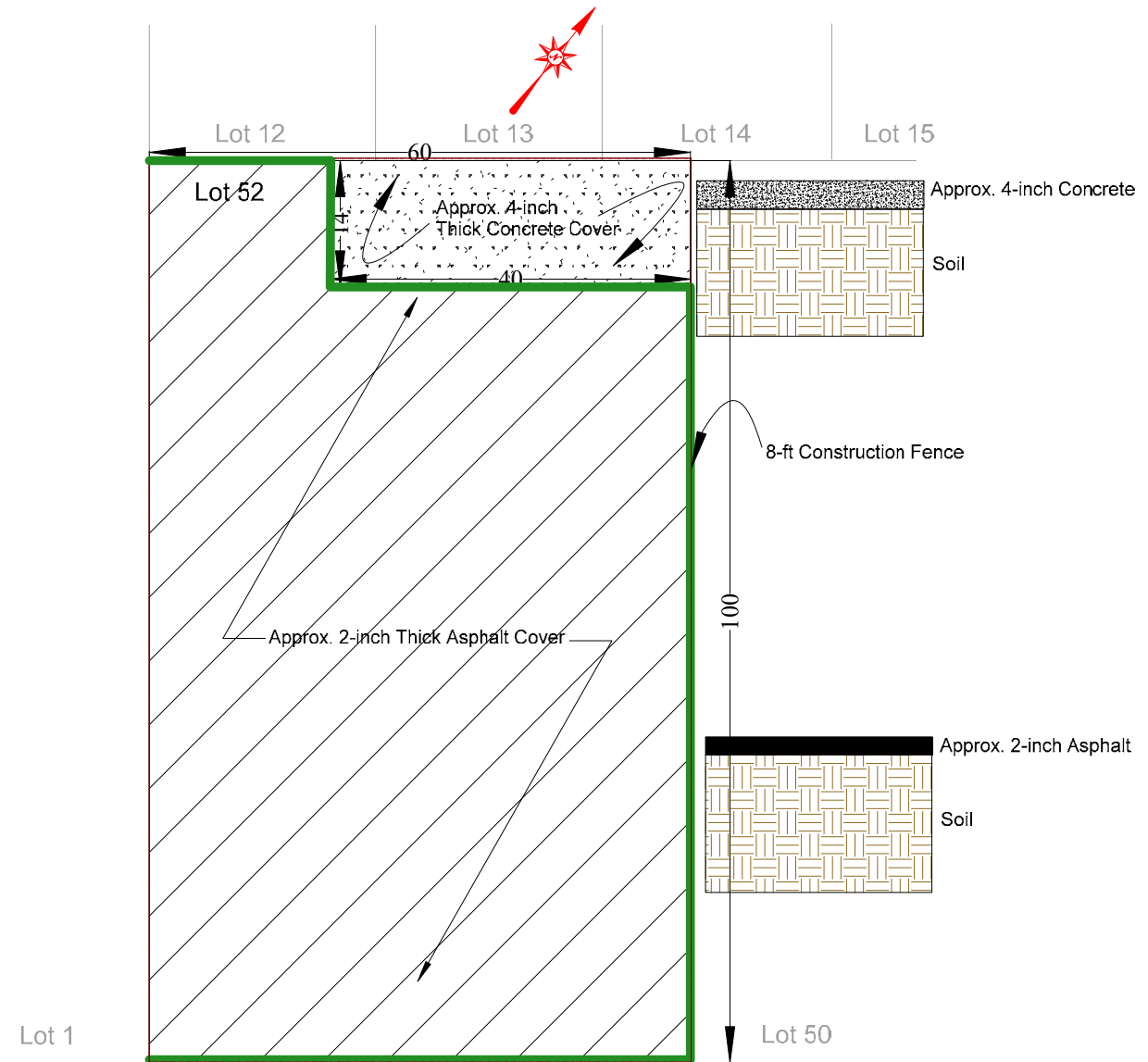


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 Langan CT, Inc.
 Langan International LLC
 Collectively known as Langan

Project
177 HARRISON AVENUE
 BLOCK No. 2266, LOT No. 1
 BROOKLYN NEW YORK

Figure Title
SITE-WIDE COVER SYSTEM PLAN



Project No. 170091701	Figure No.
Date 01/23/2015	7
Scale 1" = 30'	
Drawn By JPA	Checked By SK
Submission Date -	Sheet 6 of 8



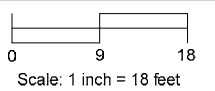
SIDEWALK

GERRY STREET

Key

-  Property Boundary
-  8-ft fence

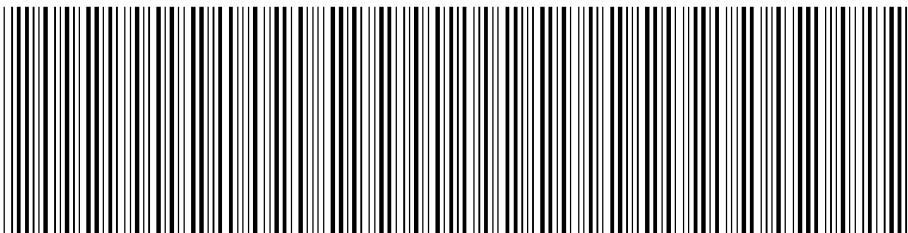
Scale



APPENDIX A
Environmental Easement

**NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER**

This page is part of the instrument. The City Register will rely on the information provided by you on this page for purposes of indexing this instrument. The information on this page will control for indexing purposes in the event of any conflict with the rest of the document.



2014062501142001001EFB3A

RECORDING AND ENDORSEMENT COVER PAGE

PAGE 1 OF 7

Document ID: 2014062501142001

Document Date: 06-11-2014

Preparation Date: 06-25-2014

Document Type: SUNDRY AGREEMENT

Document Page Count: 6

PRESENTER:

FRONTIER RECORDINGS
30 WEST BROAD STREET
SUITE 100
ROCHESTER, NY 14614
585-955-6111
RECORDINGS@FRONTIERABSTRACT.COM

RETURN TO:

FRONTIER RECORDINGS
30 WEST BROAD STREET
SUITE 100
ROCHESTER, NY 14614
585-955-6111
RECORDINGS@FRONTIERABSTRACT.COM

PROPERTY DATA

Borough	Block	Lot	Unit	Address
BROOKLYN	2266	1	Partial Lot	N/A HARRISON AVENUE
Property Type: COMMERCIAL REAL ESTATE				

CROSS REFERENCE DATA

CRFN: 2013000243646

PARTIES

PARTY 1:

BAIS RUCHEL HIGH SCHOOL INC
174 RODNEY STREET
BROOKLYN, NY 11211

FEES AND TAXES

Mortgage :

Mortgage Amount: \$ 0.00

Taxable Mortgage Amount: \$ 0.00

Exemption:

TAXES: County (Basic): \$ 0.00

City (Additional): \$ 0.00

Spec (Additional): \$ 0.00

TASF: \$ 0.00

MTA: \$ 0.00

NYCTA: \$ 0.00

Additional MRT: \$ 0.00

TOTAL: \$ 0.00

Recording Fee: \$ 67.00

Affidavit Fee: \$ 0.00

Filing Fee:

\$ 0.00

NYC Real Property Transfer Tax:

\$ 0.00

NYS Real Estate Transfer Tax:

\$ 0.00

RECORDED OR FILED IN THE OFFICE

OF THE CITY REGISTER OF THE

CITY OF NEW YORK

Recorded/Filed 06-30-2014 11:10

City Register File No.(CRFN):

2014000220216



Guanette McHill

City Register Official Signature

DECLARATION of COVENANTS and RESTRICTIONS

THIS COVENANT is made the 11 day of JUNE 2014, by Bais Ruchel High School, Inc., a corporation organized and existing under the laws of the State of New York and having an office for the transaction of business at 174 Rodney Street, Brooklyn, NY 11211.

WHEREAS, "Pfizer Sites B and D" (Site #V00350) is the subject of a Voluntary Cleanup Agreement executed by Pfizer, Inc. (to which Oholei Shloma and YGS, Inc. f/k/a Congregation YGS were added as Volunteers by amendment dated September 19, 2012, VCA Index #D2-0010-0703, Amendment #2) as part of the New York State Department of Environmental Conservation's (the "Department's") Voluntary Cleanup Program, namely that parcel of real property located at the address of 177 Harrison Avenue in the City of New York, County of Kings, State of New York, being the same as (or part of) that property conveyed to Bais Ruchel High School, Inc. by YGS, Inc. f/k/a/ Congregation YGS by deed(s) dated January 17, 2013 and recorded on June 20, 2013 in the City Register of the City of New York in Instrument No. 2013000243646, and being more particularly described in Schedule "A," attached to this declaration and made a part hereof, and hereinafter referred to as "the Property"; and

WHEREAS, the Department approved a remedy to eliminate or mitigate all significant threats to the environment presented by the contamination disposed at the Property and such remedy requires that the Property be subject to restrictive covenants.

NOW, THEREFORE, Bais Ruchel High School, Inc., for itself and its successors and/or assigns, covenants that:

First, the Property subject to this Declaration of Covenants and Restrictions is as shown on a map attached to this declaration as Schedule "B" and made a part hereof.

Second, unless prior written approval by the Department or, if the Department shall no longer exist, any New York State agency or agencies subsequently created to protect the environment of the State and the health of the State's citizens, hereinafter referred to as "the Relevant Agency," is first obtained, where contamination remains at the Property subject to the provisions of the Site Management Plan ("SMP"), there shall be no construction, use or occupancy of the Property that results in the disturbance or excavation of the Property which threatens the integrity of the engineering controls or which results in unacceptable human exposure to contaminated soils. The SMP may be obtained from the New York State Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY 12233.

Third, the owner of the Property shall not disturb, remove, or otherwise interfere with the installation, use, operation, and maintenance of engineering controls required for the Remedy, which are described in the SMP, unless in each instance the owner first obtains a written waiver of such prohibition from the Department or Relevant Agency.

Fourth, the owner of the Property shall prohibit the Property from ever being used for purposes other than for **Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(ii), Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)** without the express written waiver of such prohibition by the Department or Relevant Agency.

Fifth, the use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department.

Sixth, the owner of the Property shall provide a periodic certification, prepared and submitted by a professional engineer or environmental professional acceptable to the Department or Relevant Agency, which will certify that the institutional and engineering controls put in place are unchanged from the previous certification, comply with the SMP, and have not been impaired.

Seventh, the owner of the Property shall continue in full force and effect any institutional and engineering controls required for the Remedy and maintain such controls, unless the owner first obtains permission to discontinue such controls from the Department or Relevant Agency, in compliance with the approved SMP, which is incorporated and made enforceable hereto, subject to modifications as approved by the Department or Relevant Agency.

Eighth, this Declaration is and shall be deemed a covenant that shall run with the land and shall be binding upon all future owners of the Property, and shall provide that the owner and its successors and assigns consent to enforcement by the Department or Relevant Agency of the prohibitions and restrictions that the Voluntary Cleanup Agreement requires to be recorded, and hereby covenant not to contest the authority of the Department or Relevant Agency to seek enforcement.

Ninth, any deed of conveyance of the Property, or any portion thereof, shall recite, unless the Department or Relevant Agency has consented to the termination of such covenants and restrictions, that said conveyance is subject to this Declaration of Covenants and Restrictions.

IN WITNESS WHEREOF, the undersigned has executed this instrument the day written below.

By: Leopold Teitelbaum

Print Name: Leopold Teitelbaum

Title: President Date: 6/11/14

Grantor's Acknowledgment

STATE OF NEW YORK)
) s.s.:
COUNTY OF Kings)

On the 11TH day of JUNE, in the year 2014, before me, the undersigned, personally appeared LEOPOLD TEITELBAUM, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

ARON MANDEL

Notary Public State of New York

ARON MANDEL
NOTARY PUBLIC, State of New York
No. 01MA8289662
Qualified in Kings County
Commission Expires October 01, 2016

Date 6-11-14

SCHEDULE "A"

ALL that certain plot, piece or parcel of land, situate, lying and being in the Borough of Brooklyn, County of Kings, City and State of New York, bounded and described as follows:

BEGINNING at the corner formed by the northerly side of Harrison Avenue and the westerly side of Gerry Street;

RUNNING THENCE westerly along the northerly side of Harrison Avenue, 100 feet;

Thence northerly parallel with Gerry Street, 150 feet;

Thence easterly parallel with Harrison Avenue, 100 feet, to the westerly side of Gerry Street;

Thence southerly along the westerly side of Gerry Street 150 feet to the point or place of BEGINNING.

SCHEDULE "B"

(See Map Attached)

DESCRIPTION: Brocton Tax Block 2266 Lot 1 (Area = 0.67 Acres)

ALL the certain lots, pieces or parcels of land, situate, lying and being in the Borough of Brocton, County of Kings, City and State of New York, bounded and described as follows:

BEGINNING at the corner formed by the westerly side of Harrison Avenue and the westerly side of Gerry Street;

RUNNING THENCE westerly along the westerly side of Harrison Avenue, 200 feet to the westerly side of Wallabout Street;

Thence northerly along the easterly side of Wallabout Street, 84 feet;

Thence easterly parallel with Harrison Avenue, 50 feet;

Thence westerly parallel with Wallabout Street, 10 feet;

Thence westerly parallel with Harrison Avenue, 50 feet to the easterly side of Wallabout Street;

Thence northerly along the easterly side of Wallabout Street, 50 feet;

Thence easterly parallel with Harrison Avenue, 200 feet to the westerly side of Gerry Street;

BEGINNING at the corner formed by the westerly side of Gerry Street, 150 feet to the point or place of BEGINNING.

DESCRIPTION: NYSDEC Dred Reclamation Area (Area = 0.34 Acres)

ALL the certain lots, pieces or parcels of land, situate, lying and being in the Borough of Brocton, County of Kings, City and State of New York, bounded and described as follows:

BEGINNING at the corner formed by the northerly side of Harrison Avenue and the westerly side of Gerry Street;

RUNNING THENCE westerly along the westerly side of Harrison Avenue, 100 feet;

Thence northerly parallel with Gerry Street, 150 feet;

Thence westerly parallel with Harrison Avenue, 100 feet, to the westerly side of Gerry Street;

Thence northerly along the westerly side of Gerry Street, 150 feet to the point or place of BEGINNING.

Engineering Control Area (Area = 0.67 Acres)

ALL the certain lots, pieces or parcels of land, situate, lying and being in the Borough of Brocton, County of Kings, City and State of New York, bounded and described as follows:

BEGINNING at the corner formed by the northerly side of Harrison Avenue and the westerly side of Gerry Street;

RUNNING THENCE westerly along the westerly side of Harrison Avenue, 200 feet to the easterly side of Wallabout Street;

Thence northerly along the easterly side of Wallabout Street, 84 feet;

Thence easterly parallel with Harrison Avenue, 50 feet;

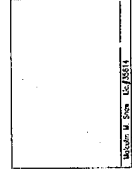
Thence northerly parallel with Wallabout Street, 16 feet;

Thence westerly parallel with Harrison Avenue, 50 feet to the easterly side of Wallabout Street;

Thence northerly parallel with Harrison Avenue, 200 feet to the westerly side of Gerry Street;

Thence southerly along the westerly side of Gerry Street, 150 feet to the point or place of BEGINNING.

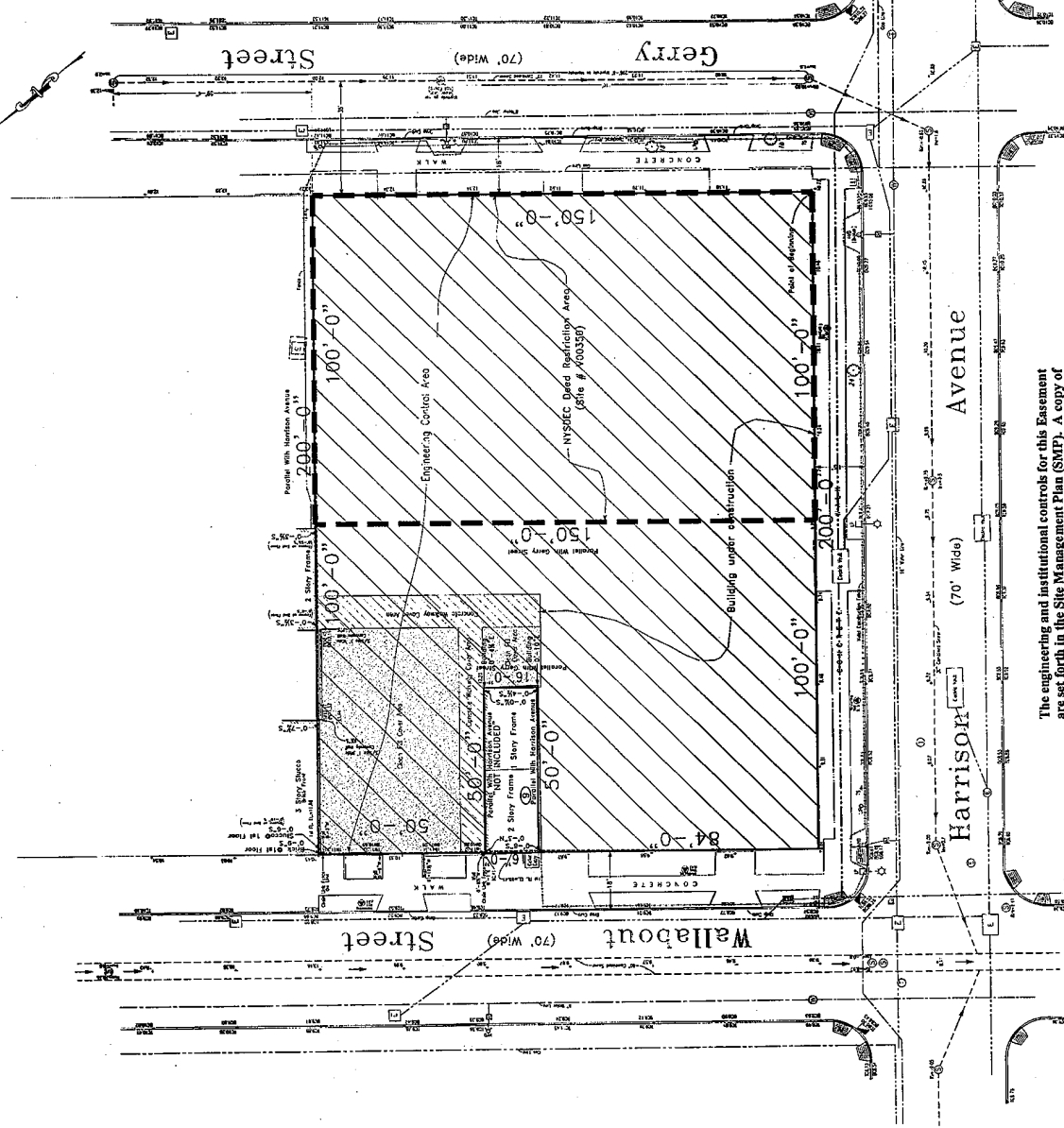
CERTIFIED TO:
1) BROOKLYN HIGH SCHOOL, INC.
2) NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION



ERL ANDERSON-CROWELL & SHAW
Civil Engineers & City Surveyors
241 BRIDGE PIKE NEW WIDE PARK, NY 11690
Tel: 516-338-6399
Fax: 516-338-6399

Date: December 5, 2013
Revised: April 10, 2014
Revised: May 1, 2014
Scale: 1"=40'

67911



The engineering and institutional controls for this Easement are set forth in the Site Management Plan (SMP). A copy of the SMP must be obtained by any party with an interest in the property. The SMP can be obtained from NYS Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY, 12233 or at derve@dec.state.ny.us

TAX BLOCK 2266 Lot 1
BOROUGH OF BROCKTON, CITY OF NEW YORK

LEGEND

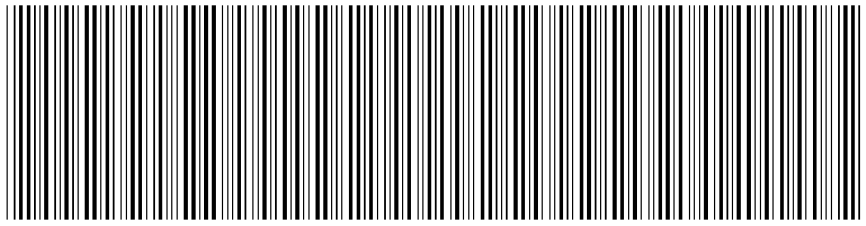
⊙	Sewer Manhole
⊚	Water Manhole
⊛	Electric Manhole
⊜	Monitoring Well & Rim Elevation
⊝	Tree & Copter
⊞	Catch Basin
⊟	Water Valve
⊠	Gas Valve
⊡	Fire Hydrant
⊢	Light Pole
⊣	Manhole/Well Sign
⊤	Traffic Sign
⊥	Precast Ramp
⊦	Tax Lot Number
⊧	Top Curb Elevation
⊨	Bottom Curb Elevation
⊩	Legal Grade
⊪	Rim Elevation
⊫	Invert Elevation
⊬	Top of Manhole Extension
⊭	Spot Elevation
⊮	Top of Wall Elevation
⊯	Base of Wall Elevation
⊰	Chain Link Fence
⊱	Concrete or Stone Curb
⊲	Drop Curb
⊳	Water Line
⊴	Gas Line
⊵	Electric Line
⊶	Clear FH Cover Area
⊷	Concrete Manhole Cover Area
⊸	Engineering Control Area

NOTES:

- 1) ALL ELEVATIONS SHOWN HEREIN REFER TO THE BROOKLYN HEIGHTS DATUM UNLESS OTHERWISE NOTED.
- 2) ALL DIMENSIONS UNLESS SPECIFICALLY NOTED ARE TO CENTERLINE UNLESS OTHERWISE NOTED.
- 3) ALL DIMENSIONS UNLESS SPECIFICALLY NOTED ARE TO CENTERLINE UNLESS OTHERWISE NOTED.
- 4) UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE NOTED.
- 5) UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE NOTED.
- 6) UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE TO CENTERLINE UNLESS OTHERWISE NOTED.

**NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER**

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2018031400129001001E9655

RECORDING AND ENDORSEMENT COVER PAGE

PAGE 1 OF 8

Document ID: 2018031400129001

Document Date: 02-20-2018

Preparation Date: 03-14-2018

Document Type: SUNDRY AGREEMENT

Document Page Count: 7

PRESENTER:

JOSE ALMANZAR
PERICONI, LLC
260 MADISON AVENUE, 15TH FL.
NEW YORK, NY 10016
212-213-5500
JALMANZAR@PERICONI.COM

RETURN TO:

JOSE ALMANZAR
PERICONI, LLC
260 MADISON AVENUE, 15TH FL.
NEW YORK, NY 10016
212-213-5500
JALMANZAR@PERICONI.COM

PROPERTY DATA

Borough	Block	Lot	Unit	Address
BROOKLYN	2266	52	Entire Lot	N/A GERRY STREET
Property Type: NON-RESIDENTIAL VACANT LAND				

CROSS REFERENCE DATA

CRFN _____ or DocumentID _____ or Year _____ Reel _____ Page _____ or File Number _____

PARTIES

PARTY 1:

BAIS RUCHEL HIGH SCHOOL, INC.
174 RODNEY STREET
BROOKLYN, NY 11211

FEES AND TAXES

Mortgage :

Mortgage Amount:	\$	0.00
Taxable Mortgage Amount:	\$	0.00
Exemption:		
TAXES: County (Basic):	\$	0.00
City (Additional):	\$	0.00
Spec (Additional):	\$	0.00
TASF:	\$	0.00
MTA:	\$	0.00
NYCTA:	\$	0.00
Additional MRT:	\$	0.00
TOTAL:	\$	0.00

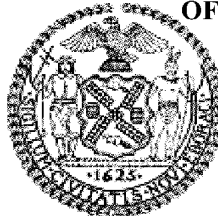
Filing Fee:

Filing Fee:	\$	0.00
NYC Real Property Transfer Tax:	\$	0.00
NYS Real Estate Transfer Tax:	\$	0.00

**RECORDED OR FILED IN THE OFFICE
OF THE CITY REGISTER OF THE**

CITY OF NEW YORK

Recorded/Filed 03-14-2018 15:28
City Register File No.(CRFN):
2018000088966



Annette McMill

City Register Official Signature

Recording Fee:	\$	EXEMPT
Affidavit Fee:	\$	0.00

DECLARATION of COVENANTS and RESTRICTIONS

THIS COVENANT is made the 20th day of FEBRUARY 2018, by Bais Ruchel High School, Inc., a corporation organized and existing under the laws of the State of New York and having an office for the transaction of business at 174 Rodney Street, Brooklyn, New York 11211.

WHEREAS, Operable Unit #3 of Pfizer Sites B and D (Site #V00350) is the subject of a Voluntary Cleanup Agreement executed by Pfizer Inc. (to which Oholei Shloma and YGS, Inc. f/k/a Congregation YGS were added as Volunteers by amendment dated September 19, 2012, VCA Index #D2-0010-0703, Amendment #2) as part of the New York State Department of Environmental Conservation's (the "Department's") Voluntary Cleanup Program, including that parcel of real property known as Brooklyn Block 2266, Lot 1 ("Lot 1") in the City of New York, County of Kings, State of New York, being the same as (or part of) that property conveyed to Bais Ruchel High School, Inc. by YGS, Inc. f/k/a Congregation YGS by deed(s) dated January 17, 2013 and recorded on June 20, 2013 in the City Register of the City of New York in Instrument No. 2013000243646; and

WHEREAS, Oholei Shloma obtained a portion of Site #V00350, namely that parcel of real property located on Gerry Street, City of New York, County of Kings, and State of New York and identified as Brooklyn Block 2266, Lot 52 confirmed by a deed dated October 2, 2013, and recorded on December 6, 2013 in the City Register of the City of New York in Instrument No. 2013000501811, being more particularly described in Schedule "A," attached to this declaration and made a part hereof, and hereinafter referred to as "the Property"; and

WHEREAS, Bais Ruchel High School, Inc. and Oholei Shloma declared that Lot 1 and the Property are to be treated as one zoning lot, as confirmed by a Declaration of Zoning Lot Restrictions dated October 22, 2014, and recorded on November 5, 2014 in the City Register of the City of New York in Instrument No. 2014000366441; and

WHEREAS, Declarations of Covenants and Restrictions were recorded on October 20, 2016 as to those portions of Site #V000350 identified as Brooklyn Block 2266, Lots 46, 47, 48, 49 and 50 (see recording information below) in the City of New York, County of Kings, State of New York, recording engineering controls on all Site #V00350 Lots excepting Lot 45 and the Property; and

WHEREAS, a Declaration of Covenants and Restrictions was recorded on October 20, 2016 in the City Register of the City of New York in Instrument No. 2016000368537 as to those portions of Site #V000350 identified Brooklyn Block 2266, Lots 46, 47 and 48 in the City of New York, County of Kings, State of New York, recording engineering controls on those portions of Site #V00350; and

WHEREAS, a Declaration of Covenants and Restrictions was recorded on October 20, 2016 in the City Register of the City of New York in Instrument No. 2016000368538 as to those portions of Site #V000350 identified Brooklyn Block 2266, Lots 49 and 50 in the City of New York, County of Kings, State of New York, recording engineering controls on those portions of Site #V00350; and

WHEREAS, a Declaration of Covenants and Restrictions was recorded on November 29, 2017 in the City Register of the City of New York in Instrument No. 2017000436670 as to those portions of Site #V000350 identified Brooklyn Block 2266, Lot 45 in the City of New York, County of Kings, State of New York, recording engineering controls on that portion of Site #V00350; and

WHEREAS, the Department approved a remedy to eliminate or mitigate all significant threats to the environment presented by the contamination disposed at the Property as to all lots comprising Site #V00350 and such remedy requires that the Property be subject to restrictive covenants.

NOW, THEREFORE, Bais Ruchel High School, Inc., for itself and its successors and/or assigns, covenants that:

First, the Property subject to this Declaration of Covenants and Restrictions is as shown on a map attached to this declaration as Schedule "B" and made a part hereof.

Second, unless prior written approval by the Department or, if the Department shall no longer exist, any New York State agency or agencies subsequently created to protect the environment of the State and the health of the State's citizens, hereinafter referred to as "the Relevant Agency," is first obtained, where contamination remains at the Property subject to the provisions of the approved Site Management Plan ("SMP") for OU3 of Site #V00350, which is incorporated and made enforceable hereto, as referenced above, there shall be no construction, use or occupancy of the Property that results in the disturbance or excavation of the Property which threatens the integrity of the engineering controls or which results in unacceptable human exposure to contaminated soils. The referenced SMP may be obtained from the New York State Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY 12233.

Third, the owner of the Property shall not disturb, remove, or otherwise interfere with the installation, use, operation, and maintenance of engineering controls required for the Remedy, which are described in the referenced SMP, unless in each instance the owner first obtains a written waiver of such prohibition from the Department or Relevant Agency.

Fourth, the owner of the Property shall prohibit the Property from ever being used for purposes other than for **Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(ii), Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)** without the express written waiver of such prohibition by the Department or Relevant Agency.

Fifth, the use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the New York City Department of Health and Mental Hygiene to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department.

Sixth, the owner of the Property shall provide a periodic certification, prepared and submitted by a professional engineer or environmental professional acceptable to the Department or Relevant Agency, which will certify that the institutional and engineering controls put in place are unchanged from the previous certification, comply with the referenced SMP, and have not been impaired.

Seventh, the owner of the Property shall continue in full force and effect any institutional and engineering controls required for the Remedy and maintain such controls, unless the owner first obtains permission to discontinue such controls from the Department or Relevant Agency, in compliance with the approved SMP, subject to modifications as approved by the Department or Relevant Agency.

Eighth, this Declaration is and shall be deemed a covenant that shall run with the land and shall be binding upon all future owners of the Property, and shall provide that the owner and its successors and assigns consent to enforcement by the Department or Relevant Agency of the prohibitions and restrictions that the Voluntary Cleanup Agreement requires to be recorded, and hereby covenant not to contest the authority of the Department or Relevant Agency to seek enforcement.

Ninth, any deed of conveyance of the Property, or any portion thereof, shall recite, unless the Department or Relevant Agency has consented to the termination of such covenants and restrictions, that said conveyance is subject to this Declaration of Covenants and Restrictions.

IN WITNESS WHEREOF, the undersigned has executed this instrument the day written below.

By: [Signature]

Print Name: SOL MOSKOVITS

Title: VP Date: 2/22/18

Grantor's Acknowledgment

STATE OF NEW YORK)

) s.s.:

COUNTY OF Kings)

On the 22 day of Feb, in the year 2018, before me, the undersigned, personally appeared Sol Moskowitz, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Notary Public State of New York

MENDEL KLEIN
NOTARY PUBLIC STATE OF NEW YORK
No. 01FL6200703
Qualified in Kings County
My Commission Expires February 09, 2021.

SCHEDULE "A"

ALL that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the Borough of Brooklyn, County of Kings, City and State of New York, bounded and described as follows:

BEGINNING at a point on the northwesterly side of Gerry Street distant 150 feet northeasterly from the corner formed by the intersection of the northwesterly side of Gerry Street with the northeasterly side of Harrison Avenue;

RUNNING THENCE northwesterly approximately parallel with Harrison Avenue, 100 feet;

THENCE northeasterly approximately parallel with Gerry Street, 60 feet;

THENCE southeasterly approximately parallel with Harrison Avenue, 100 feet;

THENCE southwesterly, along the northwesterly side of Gerry Street, 60 feet to the point or place of BEGINNING.

Note: Address, Block & Lot shown for informational purposes only

Designated as Block 2266, Lot 52.

Street Address: 75 Gerry Street, Brooklyn, NY 11206

SCHEDULE "B"

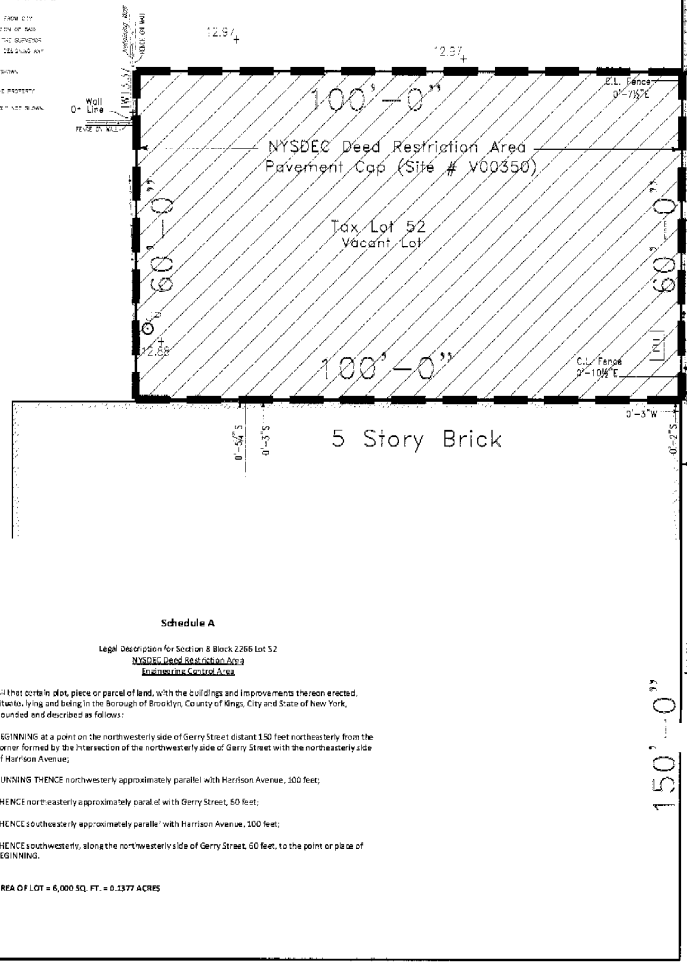
LEGEND

Survey Station	Symbol
Water Line	Symbol
Electric Service	Symbol
Manhole	Symbol
Fire Hydrant	Symbol
Gas Line	Symbol
Water Valve	Symbol
Gas Valve	Symbol
Fire Hydrant	Symbol
Manhole	Symbol
Water Main	Symbol
Gas Main	Symbol
Electric Main	Symbol
Telephone Main	Symbol
Fire Alarm	Symbol
Telephone Hand	Symbol
Fire Alarm Hand	Symbol
Fire Alarm Control	Symbol
Water Control	Symbol
Gas Control	Symbol
Electric Control	Symbol
Telephone Control	Symbol
Fire Alarm Control	Symbol
Water Control	Symbol
Gas Control	Symbol
Electric Control	Symbol
Telephone Control	Symbol
Fire Alarm Control	Symbol

THE ENGINEERING INSTITUTIONAL CONTROLS
 Institutional restrictions are set forth hereinafter in the Site Management Plan (SMP). A copy of the SMP must be obtained by any party with an interest in the property. The SMP may be obtained from the New York State Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 605 Broadway, Albany, NY 12242 or at ecsa@dec.state.ny.us



- NOTES:**
- 1) ALL ELEVATIONS SHOWN HEREON REFER TO THE BENCHMARK - SPARK 26.14 WITH A STATIONING POINT OF 100.00. ALL ELEVATIONS ARE ESTABLISHED BY THE U.S. SURVEY & MAPPING SYSTEM.
 - 2) ALL SUBSURFACE UTILITIES SHOWN HEREON WERE OBTAINED FROM CITY RECORDS & FIELD SURVEY DATA. THE DEPTH OF ALL UTILITIES IS APPROXIMATE AND IS NOT GUARANTEED BY THE SURVEYOR. ANY DISCREPANCY BETWEEN THE SHOWN DEPTH AND THE ACTUAL DEPTH SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
 - 3) ALL ELEVATIONS REFERRED TO IN THIS PLAN ARE TO THE TOP OF CURB UNLESS OTHERWISE SPECIFIED.
 - 4) THE LOT IS BOUND BY INTERESTS OF THE PROPERTY OF BRONX COUNTY.
 - 5) ALL DIMENSIONS TO CENTER UNLESS OTHERWISE SPECIFIED.



Schedule A
 Legal Description for Section 8 Block 2266 Lot 52
 NYSDEC Deed Restriction Area
 East of Gerry Street

All that certain lot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the Borough of Brooklyn, County of Kings, City and State of New York, bounded and described as follows:

BEGINNING at a point on the northwesterly side of Gerry Street distant 150 feet northerly from the corner formed by the intersection of the northwesterly side of Gerry Street with the northeasterly side of Harrison Avenue;

RUNNING THENCE northwesterly approximately parallel with Harrison Avenue, 300 feet;

THENCE northeasterly approximately parallel with Gerry Street, 60 feet;

THENCE southeasterly approximately parallel with Harrison Avenue, 100 feet;

THENCE southwesterly, along the northwesterly side of Gerry Street, 60 feet, to the point of place of **BEGINNING**.

AREA OF LOT = 6,000 SQ. FT. = 0.1377 ACRES

Harrison Avenue (70' Wide)

CERTIFIED ONLY TO: NYSDEC
 NYSDEC SITE No. V0950-2
 N/A GERRY STREET
 EASTERN PORTION OF PRIOR SITE #
 PART OF 0V2



ERLANDSEN-CROWELL & SHAW
 100 WEST 140th STREET
 C/O ENGINEERS & CITY SURVEYORS
 241 JEROME PARK NEW YORK, NY 10040
 212-246-2111
 212-246-2112

SECTION 8, BLOCK 2266, LOT 52
 BOROUGH OF BROOKLYN, CITY OF NEW YORK



DATE: DECEMBER 4, 2017

68563
 E.C. & S.C.

APPENDIX B
Excavation Work Plan

EXCAVATION WORK PLAN

1 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the site owner or their representative will notify the NYSDEC. Table 1 below includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in **Attachment A**.

Table 1: Notifications*

Name	Contact Information
Mandy Yau	718-482-4897, man-tsz.yau@dec.ny.gov
Jane O'Connell	718-482-4599, Jane.Oconnell@dec.ny.gov
Kelly Lewandowski	518-402-9581, Kelly.Lewandowski@dec.ny.gov

* Note: Notifications are subject to change and will be updated as necessary.

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent, plans for site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated and any work that may impact an engineering control,
 - A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
 - A schedule for the work, detailing the start and completion of all intrusive work,
 - A summary of the applicable components of this EWP,
 - A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120,
 - A copy of the contractor's health and safety plan, in electronic format, if it differs from the HASP provided in Appendix D of this document,
 - Identification of disposal facilities for potential waste streams,
 - Identification of sources of any anticipated backfill, along with all required chemical testing results.
-

2 SOIL SCREENING METHODS

Visual, olfactory and instrument-based soil screening will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after issuance of the COC.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal, material that requires testing, material that can be returned to the subsurface, and material that can be used as cover soil.

Further discussion of off-Site disposal of materials and on-site reuse is provided in Section E-5 of this Attachment.

3 STOCKPILE METHODS

Soil stockpiles will be continuously encircled with a berm and/or silt fence. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC.

4 MATERIALS EXCAVATION AND LOAD OUT

A qualified environmental professional or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The owner of the property and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the site will be investigated by the qualified environmental professional. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the site.

Loaded vehicles leaving the site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

The qualified environmental professional will be responsible for ensuring that all outbound trucks will be cleaned as needed before leaving the site until the activities performed under this section are complete. Locations where vehicles enter or exit the site shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

5 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Material transported by trucks exiting the site will be secured with covers. If loads contain wet material capable of producing free liquid, truck liners will be used. All trucks will be inspected prior to leaving the site. Trucks will be dry brushed when possible to remove collected soil.

Truck transport routes are as follows (see **Figure E1**):

- **ENTERING SITE** - from the Brooklyn-Queens Expressway (I-278) take the Wythe Avenue / Kent Avenue exit (31) and head south on Kent Avenue to Flushing Avenue. Turn left, heading east on Flushing Avenue to intersection with Gerry Street. Turn left on Gerry Street to Site on the left.
-

- **EXITING SITE** – head west on Gerry Street to merge with Flushing Avenue. Bare right on flushing Avenue heading west to Kent Avenue. Turn right heading north on Kent Avenue to Williamsburg Street E. Turn right on Williamsburg Street heading northeast and take the exit ramp left onto the Brooklyn Queens Expressway (I-278)..

All trucks loaded with site materials will exit the vicinity of the Site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting 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.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project site.

Egress points for truck and equipment transport from the site will be kept clean of dirt and other materials during site remediation and development.

Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

6 MATERIALS DISPOSAL OFF-SITE

All soil/fill/solid waste excavated and removed from the site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Periodic Review Report. This documentation will include:

waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

7 MATERIALS REUSE ON-SITE

Chemical criteria for on-site reuse of material is the Restricted Residential Use soil cleanup objectives. The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines. This soil will undergo a testing program to confirm that it meets unrestricted SCOs prior to unregulated disposal or reuse on-site. Confirmation testing of clean soils will be in accordance with DER-10 as follows:

Contaminant	VOCs		SVOCs, Inorganics & PCBs/Pesticides	
	Soil Quantity (cubic yards)	Discrete Samples	Composite	Discrete Samples/Composite
0-50	1	1	Each composite sample for analysis is created from 3-5 discrete samples from representative locations in the fill.	
50-100	2	1		
100-200	3	1		
200-300	4	1		
300-400	4	2		
400-500	5	2		
500-800	6	2		
800-1000	7	2		
1000	Add an additional 2 VOC and 1 composite for each additional 1000 Cubic yards or consult with DER			

The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated

on-site material, including historic fill and contaminated soil, that is acceptable for re-use on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

The qualified environmental professional will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain onsite. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the site will not be reused on-site.

8 FLUIDS MANAGEMENT

All liquids to be removed from the site, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the site, but will be managed off-site unless approval is obtained from NYSDEC.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a SPDES permit.

9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the RAWP. A demarcation layer, consisting of orange snow fencing material or equivalent material will be replaced in any areas where a soil cover is replaced, to provide a visual reference to the top of the 'Remaining Contamination Zone', the zone that requires adherence to special conditions for disturbance of remaining contaminated soils defined in this Site Management Plan. If the type of cover system changes from that which exists prior to the excavation (i.e., asphalt paved area is replaced with soil cover), as shown on

Figures 7 and 8 in the SMP, this will constitute a modification of the cover element of the remedy and the upper surface of the ‘Remaining Contamination. A figure showing the modified surface will be included in the subsequent Periodic Review Report and in any updates to the Site Management Plan.

E-10 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the site. Request to Import/Reuse Fill or Soil form, which can be found at:

<http://www.dec.ny.gov/regulations/67386.html>

will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the site.

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Based on an evaluation of the land use, protection of groundwater and protection of ecological resources criteria, soil will need to meet restricted residential soil cleanup objectives. Soils that meet ‘exempt’ fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this site, will not be imported onto the site without prior approval by NYSDEC. Solid waste will not be imported onto the site.

Fill and stone materials which can be certified as virgin mined material from a permitted mine or quarry will not require testing assuming adequate documentation is obtained and submitted to the NYSDEC for approval. Under no circumstances will fill materials be imported to the site without prior approval from the NYSDEC Project Manager. If sufficient documentation is not obtained, fill materials will be tested in accordance with the sampling frequency outlined in DER-10 table 5.4(e)10. Sample analysis will include TCL VOCs, TCL SVOCs, PCBs, Pesticides and TAL metals. Soils that meet ‘exempt’ fill requirements under 6 NYCRR Part 360, but do not meet

backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC.

Trucks entering the site with imported soils will be securely covered with covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

11 STORMWATER POLLUTION PREVENTION

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SMP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters

Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

12 CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for full a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL

pesticides and PCBs), unless the site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the periodic reports prepared pursuant to Section 5 of the SMP.

13 COMMUNITY AIR MONITORING PLAN

The CAMP provides measures for protection for the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the remedial work) from potential airborne contaminant releases resulting from remedial activities at construction sites.

The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that the remedial work did not spread contamination off-site through the air. The primary concerns for this site are nuisance odors and dust particulates.

Exceedances observed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers and included in the Daily Report. The complete CAMP developed for this site is included in **Attachment F** of the project SMP.

14 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-site and on-site. If nuisance odors are identified at the site boundary, or if odor complaints are received, 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. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt

of work, is the responsibility of the property owner's Remediation Engineer, and any measures that are implemented will be discussed in the Periodic Review Report.

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

If nuisance odors develop during intrusive work that cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

15 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

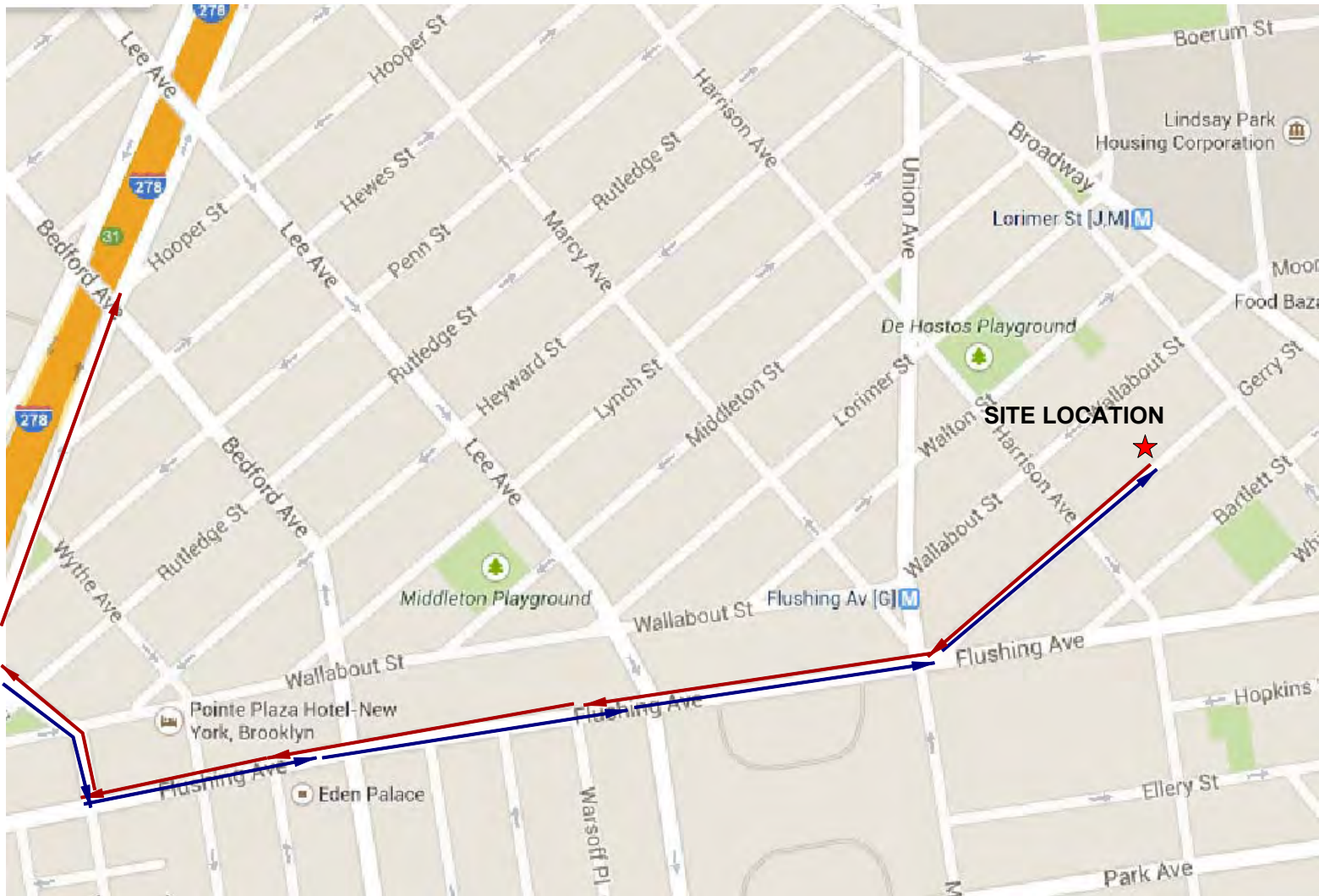
- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

16 OTHER NUISANCES



A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all excavation work.


A plan will be developed and utilized by the contractor for all excavation work to ensure compliance with local noise control ordinances.





Key

-  Truck Route to the Site
-  Truck Route from the Site

 <p>Phone 631.504.6000 Fax 631.924.2870</p>	<p>Figure No. E1</p>	<p>Site Name: FORMER PFIZER PROPERTY - DU3</p>
		<p>Site Address: 81, 83, AND 85 GERRY STREET, BROOKLYN, NY</p>
		<p>Drawing Title: TRUCK ROUTE MAP</p>

APPENDIX C
Health and Safety Plan

FORMER PFIZER PROPERTY SITE B - OPERABLE UNIT 2

**177 HARRISON AVENUE and GERRY STREET
BROOKLYN NEW YORK
Block 2266 Lots 1 and 52**

HEALTH AND SAFETY PLAN

MAY 2018

Prepared By:

EBC

ENVIRONMENTAL BUSINESS CONSULTANTS

1808 Middle Country Road
Ridge, NY 11961

HEALTH AND SAFETY PLAN

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STATEMENT OF COMMITMENT

This Health and Safety Plan (HASP) has been prepared for use during activities that disturb the asphalt cover to ensure that workers are not exposed to risks from hazardous materials.

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

1.0 INTRODUCTION AND SITE ENTRY REQUIREMENTS

This document describes the health and safety guidelines developed by Environmental Business Consultants (EBC) to ensure that workers are not exposed to risks from hazardous materials during activities that disturb the asphalt cover, concrete paver or concrete building slab at the Site. In accordance with the Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.120 Hazardous Waste Operations and Emergency Response Final rule, this HASP, including the attachments, addresses safety and health hazards related to subsurface sample collection activities and is based on the best information available. The HASP may be revised by EBC at the request of the client and/or a regulatory agency upon receipt of new information regarding site conditions. Changes will be documented by written amendments signed by EBC's project manager, site safety officer and/or the EBC health and safety consultant.

1.1 Training Requirements

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

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

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

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

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

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

1.2 Site Safety Plan Acceptance, Acknowledgment and Amendments

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

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

1.3 Key Personnel - Roles and Responsibilities

Personnel responsible for implementing this Health and Safety Plan are:

Name	Title	Address	Contact Numbers
Mr. Pat Recio	EBC Project Manager	1808 Middle Country Road Ridge, NY 11961	(631) 504-6000
Mr. Kevin Waters	Site Safety Officer	1808 Middle Country Road Ridge, NY 11961	(631) 504-6000 (516) 287-9023

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

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

1. Educating personnel about information in this HASP and other safety requirements to be observed during site operations, including, but not limited to, decontamination procedures, designation of work zones and levels of protection, air monitoring, fit testing, and emergency procedures dealing with fire and first aid.
2. Coordinating site safety decisions with the project manager.
3. Designating exclusion, decontamination and support zones on a daily basis.
4. Monitoring the condition and status of known on-site hazards and maintaining and implementing the air quality monitoring program specified in this HASP.
5. Maintaining the work zone entry/exit log and site entry/exit log.

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

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

2.0 SITE BACKGROUND AND SCOPE OF WORK

This HASP has been prepared for the property located in Gerry Street in Brooklyn, NY and identified as Block 2266 Lots 1 and 52. The property is part of Pfizer Site B Operable Unit #2 (OU-2), which is subject to a Voluntary Cleanup Agreement (VCA Index No. D2-0010-0703, Site No. V-00350-2) entered into between Pfizer Inc. (former lessee of the Site) and the New York State Department of Environmental Conservation (NYSDEC) on August 18, 2003.

Historic fill containing SVOCs and metals at concentrations above the Part 375 Unrestricted Use SCOs remains throughout the Site. The historic fill is overlain by RCA of varying thickness. The RCA is overlain by imported stone for the SMD system within the building footprint and for the site cap in the Northern Play Area and pedestrian walkways on the northern portion of the Site. All soil containing exceedances of the Track 4 SSSCOs was removed, with the exception of the following two localized areas:

- Endpoint sample AOC4-4E-EB-11 collected from AOC 4 at 11 feet bgs contained mercury at a concentration of 27.30 mg/kg, which exceeds the SSSCO of 5 mg/kg.
- Endpoint sample AOC4-4E-EW-6 along the eastern sidewall of AOC 4 at 6 feet bgs contained a total SVOC concentration of 642 mg/kg, which exceeds the SSSCO of 500 mg/kg.

Approximately 60 percent of the eastern portion of Lot 52 was excavated to a depth of 10 ft and backfilled with certified clean fill under an Interim Remedial Measure completed in 2002. Remaining contaminants in soil within the unexcavated area are defined by samples collected from soil borings advanced during area subsurface investigations performed by Pfizer in 1996 and 2004. Historic fill soil remains on the west and northwestern portions of Lot 52. Soil results from a boring in 1996 indicate that elevated levels (above restricted residential use SCOs) of mercury likely remain in the upper eight feet of soil in southwestern portion of the lot. Soil samples collected in 2005 indicate that the historic fill layer contains SVOCs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenz(a,h)anthracene, flouranthene, phenanthrene, pyrene and indeno(1,2,3-cd-pyrene) and metals (arsenic, barium, mercury and lead) above Restricted Residential Use SCOs.

Previous investigations conducted by Pfizer Inc. identified VOCs in groundwater and soil vapor samples at concentrations above the NYSDEC TOGS 1.1.1 Class GA Ambient Water Quality Standards (TOGS AWQS) and New York State Department of Health (NYSDOH) Air Guideline Values (AGVs), respectively. It has been determined that the contaminated groundwater identified on OU-2 is coming from the other Operable Units (OU-1 and OU-3) of Pfizer Sites B and D. The Volunteers are addressing potential groundwater impacts on OU-1 and OU-3 and will perform site-wide groundwater monitoring in accordance with the August 2003 VCA and approved Remedial Action Work Plans for those OUs. Groundwater remediation was not a component of the Remedial Action Work Plan for OU-2. Post-remedial soil vapor sampling has not been conducted; however, a subslab depressurization system and soil vapor barrier are specified in the Site Management Plan for any new construction with a foundation above the water table to prevent infiltration of contaminated soil vapor from contaminated groundwater into the occupied spaces of the new structure.

3.0 SITE HAZARD EVALUATION

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

This HASP has been developed for work performed at the site in association with any future excavation work on the Site. The primary hazards to the field crew will be physical hazards related to excavation procedures and equipment, and chemical exposures from exposure to contaminants remaining at the site.

3.1 Physical Hazards

3.1.1 Tripping Hazards

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

3.1.2 Cuts and Lacerations

Field activities that involve excavation equipment may result in cuts or lacerations from machinery and tools. A first aid kit approved by the American Red Cross will be available during all subsurface activities.

3.1.3 Lifting Hazards

Improper lifting by workers is one of the leading causes of industrial injuries. Excavation workers may be required to lift heavy objects such as equipment, supplies, materials, etc. Therefore, all members of the field crew should be trained in the proper methods of lifting heavy objects. All workers should be cautioned against lifting objects too heavy for one person.

3.1.4 Utility Hazards

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

3.1.5 Traffic Hazards

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

3.2 Work in Extreme Temperatures

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

3.2.1 Heat Stress

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

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

1. Prevention

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

2. Recognition and Treatment

a. Heat Rash (or prickly heat):

Cause: Continuous exposure to hot and humid air, aggravated by chafing clothing.

Symptoms: Eruption of red pimples around sweat ducts accompanied by intense itching and tingling.

Treatment: Remove source or irritation and cool skin with water or wet cloths.

b. Heat Cramps (or heat prostration)

Cause: Profuse perspiration accompanied by inadequate replenishment of body water and electrolytes.

Symptoms: Muscular weakness, staggering gait, nausea, dizziness, shallow breathing, pale and clammy skin, approximately normal body temperature.

Treatment: Perform the following while making arrangement for transport to a medical facility. Remove the worker to a contamination reduction zone. Remove protective clothing. Lie worker down on back in a cool place and raise feet 6 to 12 inches. Keep warm, but loosen all clothing. If conscious, provide sips of salt-water solution, using one teaspoon of salt in 12 ounces of water. Transport to a medical facility.

c. Heat Stroke

Cause: Same as heat exhaustion. This is also an extremely serious condition.

Symptoms: Dry and hot skin, dry mouth, dizziness, nausea, headache and rapid pulse.

Treatment: Cool worker immediately by immersing or spraying with cool water or sponge bare skin after removing protective clothing. Transport to hospital.

3.2.2 Cold Exposure

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

3.3 Chemical Hazards

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

The primary routes of exposure to these contaminants are inhalation, ingestion and absorption. **Appendix C** includes information sheets for suspected chemicals that may be encountered at the site.

Respirable Dust

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

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

Dust Control and Monitoring During Earthwork

Dust generated during excavation activities or other earthwork may contain contaminants identified in soils at the site. Dust will be controlled by wetting the working surface with water. Calcium chloride may be used if the problem cannot be controlled with water. Air monitoring and dust control techniques are specified in a site specific Dust Control Plan (if applicable). Site workers will not be required to wear APR's unless dust concentrations are consistently over 150 µg/m³ over site-specific background in the breathing zone as measured by a dust monitor unless the site safety officer directs workers to wear APRs. The site safety officer will use visible dust as an indicator to implement the dust control plan.

Organic Vapors

Considering the past and present use of the properties, VOCs may be encountered at the site in groundwater. Therefore, the release of organic vapors to the atmosphere may occur during groundwater sampling. The site safety officer will periodically monitor organic vapors with a Photoionization Detector (PID) during groundwater sampling to determine whether organic vapor concentrations exceed action levels shown below.

PID Response	Action
Sustained readings of 5 ppm or greater	Shut down equipment and allow area to vent. Resume when readings return to background
Sustained readings of 5 ppm or greater that do not subside after venting	Implement Vapor Release Plan (Section 6.8). Re-evaluate respiratory protection as upgrade may be required.

4.0 PERSONAL PROTECTIVE EQUIPMENT

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

4.1 Level D

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

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

4.2 Level C

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

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

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

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

4.3 Activity-Specific Levels of Personal Protection

The required level of PPE is activity-specific and is based properties of identified or expected contaminants. **It is expected that groundwater sampling and chemical oxidant injections will be performed in Level D.** If air monitoring results indicate the necessity to upgrade (sustained VOCs above 5 ppm in the breathing zone) the level of protection engineering controls (i.e. Facing equipment away from the wind and placing site personnel upwind of excavations, active venting, etc.) will be implemented before requiring the use of respiratory protection.

5.0 SITE CONTROL

5.1 Work Zones

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

Tasks requiring OSHA 40-hour Hazardous Waste Operations and Emergency Response Operations training are carried out in the exclusion zone. The exclusion zone is defined by the site safety officer but will typically be a 50-foot area around work activities. Gross decontamination (as determined by the site Health and Safety Officer) is conducted in the exclusion zone; all other decontamination is performed in the decontamination zone or trailer.

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

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

6.0 CONTINGENCY PLAN/EMERGENCY RESPONSE PLAN

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

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

6.1 Emergency Equipment On-site

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

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

6.2 Emergency Telephone Numbers

General Emergencies	911
New York City Police	911
Woodhull Medical Center (hospital)	(718) 963-8000
NYSDEC Spills Division	1-800-457-7362
NYSDEC Division of Env. Remediation	1-718-482-4900
NYCDEP	1-718-699-9811
NYC Department of Health	1-212-788-4711
NYC Fire Department	911
National Response Center	1-800-424-8802
Poison Control	1-800-222-1222
Site Safety Officer	1-631-504-6000
Alternate Site Safety Officer	1-631-504-6000

6.3 Personnel Responsibilities During an Emergency

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

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

- Ensure that appropriate federal, state, and local agencies are informed and emergency response plans are coordinated. In the event of fire or explosion, the local fire department should be summoned immediately. If toxic materials are released to the air, the local authorities should be informed in order to assess the need for evacuation;
- Ensure appropriate decontamination, treatment, or testing for exposed or injured personnel;
- Determine the cause of incidents and make recommendations to prevent recurrence; and,
- Ensure that all required reports have been prepared.

The following key personnel are planned for this project:

- Project Manager Mr. Pat Recio (631) 504-6000
- Site Safety Officer Mr. Kevin Waters (631) 504-6000
- Alternate Mr. Charles Sosik (631) 504-6000

6.4 Medical Emergencies

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

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

6.5 Fire or Explosion

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

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

6.6 Evacuation Routes

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

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

- Keep upwind of smoke, vapors, or spill location.
- Exit through the decontamination corridor if possible.
- If evacuation through the decontamination corridor is not possible, personnel should remove contaminated clothing once they are in a safe location and leave it near the exclusion zone or in a safe place.
- The site safety officer will conduct a head count to ensure that all personnel have been evacuated safely. The head count will be correlated to the site and/or exclusion zone entry/exit log.
- If emergency site evacuation is necessary, all personnel are to escape the emergency situation and decontaminate to the maximum extent practical.

6.7 Spill Control Procedures

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

6.8 Vapor Release Plan

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

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

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

APPENDIX A
SITE SAFETY ACKNOWLEDGEMENT FORM

DAILY BRIEFING SIGN-IN SHEET

Date: _____ Person Conducting Briefing: _____

Project Name and Location: _____

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

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

3. ATTENDEES (Print Name):

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

APPENDIX B
SITE SAFETY PLAN AMENDMENTS

SITE SAFETY PLAN AMENDMENT FORM

Site Safety Plan Amendment #: _____

Site Name: _____

Reason for Amendment: _____

Alternative Procedures: _____

Required Changes in PPE: _____

Project Superintendent (signature)

Date

Health and Safety Consultant (signature)

Date

Site Safety Officer (signature)

Date

APPENDIX C

CHEMICAL HAZARDS

CHEMICAL HAZARDS

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

International Chemical Safety Cards

BENZ(a)ANTHRACENE

ICSC: 0385



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

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



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

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

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0385

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


International Chemical Safety Cards

ICSC: 0385

BENZ(a)ANTHRACENE

I M P O R T A N T D A T A	<p>PHYSICAL STATE; APPEARANCE: COLOURLESS TO YELLOW BROWN FLUORESCENT FLAKES OR POWDER.</p> <p>PHYSICAL DANGERS: Dust explosion possible if in powder or granular form, mixed with air.</p> <p>CHEMICAL DANGERS:</p> <p>OCCUPATIONAL EXPOSURE LIMITS: TLV: A2 (suspected human carcinogen); (ACGIH 2004). MAK: Carcinogen category: 2 (as pyrolysis product of organic materials) (DFG 2005).</p>	<p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation, through the skin and by ingestion.</p> <p>INHALATION RISK: Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.</p> <p>EFFECTS OF SHORT-TERM EXPOSURE:</p> <p>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: This substance is probably carcinogenic to humans.</p>
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PHYSICAL PROPERTIES	Sublimation point: 435°C Melting point: 162°C Relative density (water = 1): 1.274 Solubility in water: none	Vapour pressure, Pa at 20°C: 292 Octanol/water partition coefficient as log Pow: 5.61
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ENVIRONMENTAL DATA	Bioaccumulation of this chemical may occur in seafood.	
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NOTES

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

ADDITIONAL INFORMATION

ICSC: 0385	BENZ(a)ANTHRACENE
(C) IPCS, CEC, 1994	

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

BENZO(a)PYRENE

ICSC: 0104



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

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



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

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

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0104

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


International Chemical Safety Cards

BENZO(a)PYRENE

ICSC: 0104

I M P O R T A N T A D V I S I O N	<p>PHYSICAL STATE; APPEARANCE: PALE-YELLOW CRYSTALS</p> <p>PHYSICAL DANGERS:</p> <p>CHEMICAL DANGERS: Reacts with strong oxidants causing fire and explosion hazard.</p> <p>OCCUPATIONAL EXPOSURE LIMITS: TLV: Exposure by all routes should be carefully controlled to levels as low as possible A2 (suspected human carcinogen); (ACGIH 2005). MAK: Carcinogen category: 2; Germ cell mutagen group: 2; (DFG 2005).</p>	<p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation of its aerosol, through the skin and by ingestion.</p> <p>INHALATION RISK: Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.</p> <p>EFFECTS OF SHORT-TERM EXPOSURE:</p> <p>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: This substance is carcinogenic to humans. May cause heritable genetic damage to human germ cells. Animal tests show that this substance possibly causes toxicity to human reproduction or development.</p>
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PHYSICAL PROPERTIES	Boiling point: 496°C Melting point: 178.1°C Density: 1.4 g/cm ³	Solubility in water: none (<0.1 g/100 ml) Vapour pressure : negligible Octanol/water partition coefficient as log Pow: 6.04
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ENVIRONMENTAL DATA	The substance is very toxic to aquatic organisms. Bioaccumulation of this chemical may occur in fish, in plants and in molluscs. The substance may cause long-term effects in the aquatic environment.	
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NOTES

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

ADDITIONAL INFORMATION

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ICSC: 0104

BENZO(a)PYRENE

(C) IPCS, CEC, 1994

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

BENZO(b)FLUORANTHENE

ICSC: 0720



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

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



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

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

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0720

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

International Chemical Safety Cards

BENZO(b)FLUORANTHENE

ICSC: 0720

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

CHEMICAL DANGERS:

Upon heating, toxic fumes are formed.

OCCUPATIONAL EXPOSURE LIMITS:

TLV: A2 (suspected human carcinogen); (ACGIH 2004).

MAK:

Carcinogen category: 2;
(DFG 2004).

of its aerosol and through the skin.

INHALATION RISK:

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

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:

This substance is possibly carcinogenic to humans. May cause genetic damage in humans.

PHYSICAL PROPERTIES

Boiling point: 481°C
Melting point: 168°C
Solubility in water:
none

Octanol/water partition coefficient as log Pow: 6.12

ENVIRONMENTAL DATA

This substance may be hazardous to the environment; special attention should be given to air quality and water quality.



NOTES

Benzo(b)fluoranthene is present as a component of polycyclic aromatic hydrocarbons (PAH) content in the environment usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco. ACGIH recommends environment containing benzo(b)fluoranthene should be evaluated in terms of the TLV-TWA for coal tar pitch volatile, as benzene soluble 0.2 mg/m³. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken.

ADDITIONAL INFORMATION

ICSC: 0720

BENZO(b)FLUORANTHENE

(C) IPCS, CEC, 1994

IMPORTANT LEGAL NOTICE:

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International Chemical Safety Cards

BENZO(g,h,i)FLUORANTHENE

ICSC: 0527



2,13-Benzofluoranthene
Benzo(mno)fluoranthene
 $C_{18}H_{10}$
Molecular mass: 226.3

ICSC # 0527
CAS # 203-12-3
RTECS # [DF6140000](#)
March 25, 1998 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray, powder.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST!	
• INHALATION		Local exhaust or breathing protection.	
• SKIN	MAY BE ABSORBED!	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention. Wear protective gloves when administering first aid.
• EYES		Safety goggles, face shield, or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION		Do not eat, drink, or smoke during work.	

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

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0527

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

International Chemical Safety Cards

BENZO(g,h,i)FLUORANTHENE

ICSC: 0527

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

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INHALATION RISK:

CHEMICAL DANGERS:

The substance decomposes on heating producing toxic fumes.

EFFECTS OF SHORT-TERM EXPOSURE:

OCCUPATIONAL EXPOSURE LIMITS:

TLV not established.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:

See Notes.

PHYSICAL PROPERTIES

Melting point: 149°C
Solubility in water: none
Vapour pressure, Pa at 20°C: <10

Relative vapour density (air = 1): 7.8
Relative density of the vapour/air-mixture at 20°C (air = 1): 1.0
Octanol/water partition coefficient as log Pow: 7.23

ENVIRONMENTAL DATA

This substance may be hazardous to the environment; special attention should be given to the total environment. In the food chain important to humans, bioaccumulation takes place, specifically in oils and fats.



NOTES

Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken. Also consult ICSC #0720 and 0721.

ADDITIONAL INFORMATION

ICSC: 0527

BENZO(g,h,i)FLUORANTHENE

(C) IPCS, CEC, 1994

IMPORTANT LEGAL NOTICE:

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International Chemical Safety Cards

BENZO(k)FLUORANTHENE

ICSC: 0721



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

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



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

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

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0721

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

International Chemical Safety Cards

BENZO(k)FLUORANTHENE

ICSC: 0721

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

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PHYSICAL DANGERS:

CHEMICAL DANGERS:

Upon heating, toxic fumes are formed.

OCCUPATIONAL EXPOSURE LIMITS:

TLV not established.

MAK:

Carcinogen category: 2;
(DFG 2004).

INHALATION RISK:

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

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:

This substance is possibly carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 480°C
Melting point: 217°C
Solubility in water:
none

Octanol/water partition coefficient as log Pow: 6.84

ENVIRONMENTAL DATA

This substance may be hazardous to the environment; special attention should be given to air quality and water quality. Bioaccumulation of this chemical may occur in crustacea and in fish.



NOTES

Benzo(k)fluoranthene is present as a component of polycyclic aromatic hydrocarbons (PAH) content in the environment usually resulting from the incomplete combustion or pyrolysis of organic matters, especially fossil fuels and tobacco. ACGIH recommends environment containing benzo(k)fluoranthene should be evaluated in terms of the TLV-TWA for coal tar pitch volatile, as benzene soluble 0.2 mg/m³. Insufficient data are available on the effect of this substance on human health, therefore utmost care must be taken.

ADDITIONAL INFORMATION

ICSC: 0721

BENZO(k)FLUORANTHENE

(C) IPCS, CEC, 1994

IMPORTANT LEGAL NOTICE:

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

International Chemical Safety Cards

CHRYSENE

ICSC: 1672



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

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



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

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

SEE IMPORTANT INFORMATION ON BACK


International Chemical Safety Cards

CHRYSENE

ICSC: 1672

<p>I M P O R T A N T D A T A</p>	<p>PHYSICAL STATE; APPEARANCE: COLOURLESS TO BEIGE CRYSTALS OR POWDER</p> <p>PHYSICAL DANGERS: Dust explosion possible if in powder or granular form, mixed with air.</p> <p>CHEMICAL DANGERS: The substance decomposes on burning producing toxic fumes Reacts violently with strong oxidants</p> <p>OCCUPATIONAL EXPOSURE LIMITS: TLV: A3 (confirmed animal carcinogen with unknown relevance to humans); (ACGIH 2006). MAK not established.</p>	<p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation of its aerosol, through the skin and by ingestion.</p> <p>INHALATION RISK: A harmful concentration of airborne particles can be reached quickly when dispersed</p> <p>EFFECTS OF SHORT-TERM EXPOSURE:</p> <p>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: This substance is possibly carcinogenic to humans.</p>
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<p>PHYSICAL PROPERTIES</p>	<p>Boiling point: 448°C Melting point: 254 - 256°C Density: 1.3 g/cm³</p>	<p>Solubility in water: very poor Octanol/water partition coefficient as log Pow: 5.9</p>
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<p>ENVIRONMENTAL DATA</p>	<p>The substance is very toxic to aquatic organisms. Bioaccumulation of this chemical may occur in seafood. It is strongly advised that this substance does not enter the environment.</p>	
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NOTES

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

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

ADDITIONAL INFORMATION

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ICSC: 1672

CHRYSENE

(C) IPCS, CEC, 1994

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

DIBENZO(a,h)ANTHRACENE

ICSC: 0431



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

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



TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Combustible.	NO open flames.	Water spray, powder.
EXPLOSION			
EXPOSURE		AVOID ALL CONTACT!	
• INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
• SKIN	Redness. Swelling. Itching.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
• EYES	Redness.	Face shield or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION		Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth.
SPILLAGE DISPOSAL		STORAGE	PACKAGING & LABELLING
Sweep spilled substance into sealable containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Personal protection: P3 filter respirator for toxic particles.		Well closed.	T symbol N symbol R: 45-50/53 S: 53-45-60-61
SEE IMPORTANT INFORMATION ON BACK			
ICSC: 0431		Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.	

International Chemical Safety Cards

DIBENZO(a,h)ANTHRACENE

ICSC: 0431

I M P O	<p>PHYSICAL STATE; APPEARANCE: COLOURLESS CRYSTALLINE POWDER.</p> <p>PHYSICAL DANGERS:</p>	<p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation, through the skin and by ingestion.</p> <p>INHALATION RISK: Evaporation at 20°C is negligible; a harmful concentration</p>
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CHEMICAL DANGERS:

of airborne particles can, however, be reached quickly.

OCCUPATIONAL EXPOSURE LIMITS:

TLV not established.

EFFECTS OF SHORT-TERM EXPOSURE:

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:

The substance may have effects on the skin, resulting in photosensitization. This substance is probably carcinogenic to humans.

PHYSICAL PROPERTIES

Boiling point: 524°C
Melting point: 267°C
Relative density (water = 1): 1.28

Solubility in water:
none
Octanol/water partition coefficient as log Pow: 6.5

ENVIRONMENTAL DATA

Bioaccumulation of this chemical may occur in seafood.



NOTES

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

ADDITIONAL INFORMATION

ICSC: 0431

DIBENZO(a,h)ANTHRACENE

(C) IPCS, CEC, 1994

IMPORTANT LEGAL NOTICE:

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1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Phenanthrene

Product Number : 695114
Brand : Aldrich

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052
Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards

Harmful by ingestion., Irritant

Other hazards which do not result in classification

Photosensitizer.

GHS Label elements, including precautionary statements

Pictogram



Signal word

Warning

Hazard statement(s)

H302	Harmful if swallowed.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H400	Very toxic to aquatic life.
H413	May cause long lasting harmful effects to aquatic life.

Precautionary statement(s)

P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P273	Avoid release to the environment.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

HMIS Classification

Health hazard:	2
Flammability:	0
Physical hazards:	0

NFPA Rating

Health hazard:	2
Fire:	0
Reactivity Hazard:	0

Potential Health Effects

Inhalation	May be harmful if inhaled. Causes respiratory tract irritation.
Skin	May be harmful if absorbed through skin. Causes skin irritation.

Eyes
Ingestion

Causes eye irritation.
Harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Formula : C₁₄H₁₀
Molecular Weight : 178.23 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
Phenanthrene			
85-01-8	201-581-5	-	-

4. FIRST AID MEASURES

General advice

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

If inhaled

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

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

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

If swallowed

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

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

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

Special protective equipment for fire-fighters

Wear self contained breathing apparatus for fire fighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

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

Environmental precautions

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

Methods and materials for containment and cleaning up

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

7. HANDLING AND STORAGE

Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols.

Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.

Conditions for safe storage

Keep container tightly closed in a dry and well-ventilated place.

Handle and store under inert gas.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value	Control	Update	Basis
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			parameters		
Phenanthrene	85-01-8	TWA	0.2 mg/m ³	1993-06-30	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.2 mg/m ³	1989-03-01	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

Personal protective equipment

Respiratory protection

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

Hand protection

Handle with gloves.

Eye protection

Safety glasses with side-shields conforming to EN166

Skin and body protection

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

Hygiene measures

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form solid

Safety data

pH no data available
Melting point 98 - 100 °C (208 - 212 °F)
Boiling point 340 °C (644 °F)
Flash point no data available
Ignition temperature no data available
Lower explosion limit no data available
Upper explosion limit no data available
Density 1.063 g/mL at 25 °C (77 °F)
Water solubility no data available
Partition coefficient: log Pow: 4.57
n-octanol/water

10. STABILITY AND REACTIVITY

Chemical stability

Stable under recommended storage conditions.

Conditions to avoid

no data available

Materials to avoid

Oxidizing agents

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

11. TOXICOLOGICAL INFORMATION

Acute toxicity

LD50 Oral - mouse - 700.0 mg/kg

Skin corrosion/irritation

no data available

Serious eye damage/eye irritation

no data available

Respiratory or skin sensitization

Causes photosensitivity. Exposure to light can result in allergic reactions resulting in dermatologic lesions, which can vary from sunburnlike responses to edematous, vesiculated lesions, or bullae

Germ cell mutagenicity

no data available

Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

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

IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (Phenanthrene)

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

no data available

Specific target organ toxicity - single exposure (Globally Harmonized System)

Inhalation - May cause respiratory irritation.

Specific target organ toxicity - repeated exposure (Globally Harmonized System)

no data available

Aspiration hazard

no data available

Potential health effects

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

Signs and Symptoms of Exposure

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

Additional Information

12. ECOLOGICAL INFORMATION**Toxicity**

Toxicity to fish	LC50 - Oncorhynchus mykiss (rainbow trout) - 3.2 mg/l - 96.0 h LC100 - other fish - 1.5 mg/l - 1.0 h
Toxicity to daphnia	EC50 - Daphnia magna (Water flea) - 0.86 mg/l - 24 h

and other aquatic invertebrates.

EC50 - Daphnia magna (Water flea) - 0.38 mg/l - 48 h

Toxicity to algae EC50 - Chlorella vulgaris (Fresh water algae) - 1.20 mg/l - 3 h

Persistence and degradability

Biodegradability Result: 55 - 95 % - Partially biodegradable.

Bioaccumulative potential

Bioaccumulation Pimephales promelas (fathead minnow) - 28 d
Bioconcentration factor (BCF): 5,100

Mobility in soil

no data available

PBT and vPvB assessment

no data available

Other adverse effects

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

Very toxic to aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Product

Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN-Number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (Phenanthrene)
Reportable Quantity (RQ): 5000 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG

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

IATA

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

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

OSHA Hazards

Harmful by ingestion., Irritant

DSL Status

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

SARA 302 Components

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

SARA 313 Components

	CAS-No.	Revision Date
Phenanthrene	85-01-8	2007-07-01

SARA 311/312 Hazards

Acute Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Phenanthrene	85-01-8	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Phenanthrene	85-01-8	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Phenanthrene	85-01-8	2007-07-01

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. Phenanthrene	85-01-8	1990-01-01

16. OTHER INFORMATION**Further information**

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

International Chemical Safety Cards

PYRENE

ICSC: 1474



Benzo (d,e,f) phenanthrene
beta-Pyrene
 $C_{16}H_{10}$
Molecular mass: 202.26

ICSC # 1474
CAS # 129-00-0
RTECS # [UR2450000](#)
November 27, 2003 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames, NO sparks, and NO smoking.	Water spray, carbon dioxide, dry powder, alcohol-resistant foam, foam.
EXPLOSION			
EXPOSURE			
• INHALATION		Avoid inhalation of dust	Fresh air, rest.
• SKIN	Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
• EYES	Redness.	Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION		Do not eat, drink, or smoke during work.	Do NOT induce vomiting. Give plenty of water to drink. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder Do NOT let this chemical enter the environment. (Extra personal protection: P2 filter respirator for harmful particles.)	Separated from strong oxidants. Keep in a well-ventilated room.	Do not transport with food and feedstuffs. R: S:

SEE IMPORTANT INFORMATION ON BACK

ICSC: 1474

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

International Chemical Safety Cards

PYRENE

ICSC: 1474

I	PHYSICAL STATE; APPEARANCE: YELLOW COLOURLESS SOLID IN VARIOUS FORMS	ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation through the skin and by ingestion
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PHYSICAL DANGERS:

CHEMICAL DANGERS:

The substance decomposes on heating producing irritating fumes

OCCUPATIONAL EXPOSURE LIMITS:

TLV not established.
MAK not established.

INHALATION RISK:

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

EFFECTS OF SHORT-TERM EXPOSURE:

Exposure to sun may provoke an irritating effect of pyrene on skin and lead to chronic skin discoloration.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:

PHYSICAL PROPERTIES

Boiling point: 404°C
Melting point: 151°C
Density: 1.27 g/cm³

Solubility in water: 0.135 mg/l at 25°C
Vapour pressure, Pa at °C: 0.08
Octanol/water partition coefficient as log Pow: 4.88

ENVIRONMENTAL DATA

Bioaccumulation of this chemical may occur in crustacea, in fish, in milk, in algae and in molluscs. It is strongly advised that this substance does not enter the environment.



NOTES

Pyrene is one of many polycyclic aromatic hydrocarbons - standards are usually established for them as mixtures, e.g., coal tar pitch volatiles. However, pyrene may be encountered as a laboratory chemical in its pure form. Health effects of exposure to the substance have not been investigated adequately. See ICSC 1415 Coal-tar pitch.

ADDITIONAL INFORMATION

ICSC: 1474

PYRENE

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International Chemical Safety Cards

ARSENIC

ICSC: 0013



Grey arsenic
As
Atomic mass: 74.9

ICSC # 0013
CAS # 7440-38-2
RTECS # [CG0525000](#)
UN # 1558
EC # 033-001-00-X

October 18, 1999 Peer reviewed



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

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

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0013

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International Chemical Safety Cards

ARSENIC

ICSC: 0013

<p>I M P O R T A N T D A T A</p>	<p>PHYSICAL STATE; APPEARANCE: ODOURLESS, BRITTLE, GREY, METALLIC-LOOKING CRYSTALS.</p> <p>PHYSICAL DANGERS:</p> <p>CHEMICAL DANGERS: Upon heating, toxic fumes are formed. Reacts violently with strong oxidants and halogens, causing fire and explosion hazard. Reacts with acids to produce</p> <p>OCCUPATIONAL EXPOSURE LIMITS: TLV: 0.01 mg/m³ as TWA A1 (confirmed human carcinogen); BEI issued (ACGIH 2004). MAK: Carcinogen category: 1; Germ cell mutagen group: 3A; (DFG 2004). OSHA PEL: 1910.1018 TWA 0.010 mg/m³ NIOSH REL: Ca C 0.002 mg/m³ 15-minute See Appendix A NIOSH IDLH: Ca 5 mg/m³ (as As) See: 7440382</p>	<p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.</p> <p>INHALATION RISK: Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly, when dispersed.</p> <p>EFFECTS OF SHORT-TERM EXPOSURE: The substance is irritating to the eyes the skin and the respiratory tract. The substance may cause effects on the gastrointestinal tract cardiovascular system central nervous system kidneys , resulting in severe gastroenteritis, loss of fluid, and electrolytes, cardiac disorders shock convulsions and kidney impairment Exposure above the OEL may result in death. The effects may be delayed. Medical observation is indicated.</p> <p>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the mucous membranes, skin, peripheral nervous system liver bone marrow , resulting in pigmentation disorders, hyperkeratosis, perforation of nasal septum, neuropathy, liver impairment anaemia This substance is carcinogenic to humans. Animal tests show that this substance possibly causes toxicity to human reproduction or development.</p>
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<p>PHYSICAL PROPERTIES</p>	<p>Sublimation point: 613°C Density: 5.7 g/cm³</p>	<p>Solubility in water: none</p>
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<p>ENVIRONMENTAL DATA</p>	<p>The substance is toxic to aquatic organisms. It is strongly advised that this substance does not enter the environment.</p>	
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NOTES

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

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

ADDITIONAL INFORMATION

ICSC: 0013 **ARSENIC**

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International Chemical Safety Cards

BARIUM SULFATE

ICSC: 0827



Barium sulphate
Blanc fixe
Artificial barite
BaSO₄

Molecular mass: 233.43

ICSC # 0827

CAS # 7727-43-7

RTECS # [CR0600000](#)

October 20, 1999 Peer reviewed

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
FIRE	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
EXPLOSION			
EXPOSURE		PREVENT DISPERSION OF DUST!	
• INHALATION		Local exhaust or breathing protection.	Fresh air, rest.
• SKIN		Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
• EYES		Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• INGESTION		Do not eat, drink, or smoke during work.	Rinse mouth.
SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING	
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Personal protection: P1 filter respirator for inert particles.		R: S:	
SEE IMPORTANT INFORMATION ON BACK			
ICSC: 0827	Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1994. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.		

International Chemical Safety Cards

BARIUM SULFATE

ICSC: 0827

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

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

ADDITIONAL INFORMATION

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ICSC: 0827	BARIUM SULFATE
(C) IPCS, CEC, 1994	

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

CHROMIUM

ICSC: 0029



Chrome
Cr
Atomic mass: 52.0
(powder)

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

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

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

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0029

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

International Chemical Safety Cards

CHROMIUM

ICSC: 0029

I	PHYSICAL STATE; APPEARANCE: GREY POWDER	ROUTES OF EXPOSURE:
M	PHYSICAL DANGERS: Dust explosion possible if in powder or granular form, mixed with air.	INHALATION RISK: A harmful concentration of airborne particles can be reached quickly when dispersed.
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CHEMICAL DANGERS:

Chromium is a catalytic substance and may cause reaction in contact with many organic and inorganic substances , causing fire and explosion hazard.

EFFECTS OF SHORT-TERM EXPOSURE:

May cause mechanical irritation to the eyes and the respiratory tract.

OCCUPATIONAL EXPOSURE LIMITS:

TLV: (as Cr metal, Cr(III) compounds) 0.5 mg/m³ as TWA A4 (ACGIH 2004).
MAK not established.

EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:

OSHA PEL*: TWA 1 mg/m³ [See Appendix C](#) *Note: The PEL also applies to insoluble chromium salts.

NIOSH REL: TWA 0.5 mg/m³ [See Appendix C](#)

NIOSH IDLH: 250 mg/m³ (as Cr) See: [7440473](#)

PHYSICAL PROPERTIES

Boiling point: 2642°C
Melting point: 1900°C
Density: 7.15 g/cm³

Solubility in water:
none

ENVIRONMENTAL DATA

NOTES

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

ADDITIONAL INFORMATION

ICSC: 0029

CHROMIUM

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International Chemical Safety Cards

LEAD

ICSC: 0052



Lead metal
Plumbum
Pb
Atomic mass: 207.2
(powder)

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

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

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

SEE IMPORTANT INFORMATION ON BACK


ICSC: 0052

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

International Chemical Safety Cards

<p>I M P O R T A N T D A T A</p>	<p>PHYSICAL STATE; APPEARANCE: BLUISH-WHITE OR SILVERY-GREY SOLID IN VARIOUS FORMS. TURNS TARNISHED ON EXPOSURE TO AIR.</p> <p>PHYSICAL DANGERS: Dust explosion possible if in powder or granular form, mixed with air.</p> <p>CHEMICAL DANGERS: On heating, toxic fumes are formed. Reacts with oxidants. Reacts with hot concentrated nitric acid, boiling concentrated hydrochloric acid and sulfuric acid. Attacked by pure water and by weak organic acids in the presence of oxygen.</p> <p>OCCUPATIONAL EXPOSURE LIMITS: TLV: 0.05 mg/m³ A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued (ACGIH 2004). MAK: Carcinogen category: 3B; Germ cell mutagen group: 3A; (DFG 2004). EU OEL: as TWA 0.15 mg/m³ (EU 2002). OSHA PEL*: 1910.1025 TWA 0.050 mg/m³ See Appendix C *Note: The PEL also applies to other lead compounds (as Pb) -- see Appendix C. NIOSH REL*: TWA 0.050 mg/m³ See Appendix C *Note: The REL also applies to other lead compounds (as Pb) -- see Appendix C. NIOSH IDLH: 100 mg/m³ (as Pb) See: 7439921</p>	<p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation and by ingestion.</p> <p>INHALATION RISK: A harmful concentration of airborne particles can be reached quickly when dispersed, especially if powdered.</p> <p>EFFECTS OF SHORT-TERM EXPOSURE:</p> <p>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: The substance may have effects on the blood bone marrow central nervous system peripheral nervous system kidneys , resulting in anaemia, encephalopathy (e.g., convulsions), peripheral nerve disease, abdominal cramps and kidney impairment. Causes toxicity to human reproduction or development.</p>
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PHYSICAL PROPERTIES	Boiling point: 1740°C Melting point: 327.5°C	Density: 11.34 g/cm ³ Solubility in water: none
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ENVIRONMENTAL DATA	Bioaccumulation of this chemical may occur in plants and in mammals. It is strongly advised that this substance does not enter the environment.	
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NOTES

Depending on the degree of exposure, periodic medical examination is suggested. Do NOT take working clothes home.
 Transport Emergency Card: TEC (R)-51S1872

ADDITIONAL INFORMATION

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ICSC: 0052	LEAD
(C) IPCS, CEC, 1994	

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International Chemical Safety Cards

MERCURY

ICSC: 0056



Quicksilver
Liquid silver
Hg
Atomic mass: 200.6

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



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

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

SEE IMPORTANT INFORMATION ON BACK

ICSC: 0056

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


International Chemical Safety Cards

MERCURY

ICSC: 0056

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

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

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

ADDITIONAL INFORMATION

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ICSC: 0056

MERCURY

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International Chemical Safety Cards

ZINC POWDER

ICSC: 1205



Blue powder
Merrillite
Zn
Atomic mass: 65.4
(powder)

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



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

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

SEE IMPORTANT INFORMATION ON BACK

ICSC: 1205

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International Chemical Safety Cards

ZINC POWDER

ICSC: 1205

<p>I M P O R T A N T D A T A</p>	<p>PHYSICAL STATE; APPEARANCE: ODOURLESS GREY TO BLUE POWDER.</p> <p>PHYSICAL DANGERS: Dust explosion possible if in powder or granular form, mixed with air. If dry, it can be charged electrostatically by swirling, pneumatic transport, pouring, etc.</p> <p>CHEMICAL DANGERS: Upon heating, toxic fumes are formed. The substance is a strong reducing agent and reacts violently with oxidants. Reacts with water and reacts violently with acids and bases forming flammable/explosive gas (hydrogen - see ICSC0001) Reacts violently with sulfur, halogenated hydrocarbons and many other substances causing fire and explosion hazard.</p> <p>OCCUPATIONAL EXPOSURE LIMITS: TLV not established.</p>	<p>ROUTES OF EXPOSURE: The substance can be absorbed into the body by inhalation and by ingestion.</p> <p>INHALATION RISK: Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.</p> <p>EFFECTS OF SHORT-TERM EXPOSURE: Inhalation of fumes may cause metal fume fever. The effects may be delayed.</p> <p>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE: Repeated or prolonged contact with skin may cause dermatitis.</p>
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<p>PHYSICAL PROPERTIES</p>	<p>Boiling point: 907°C Melting point: 419°C Relative density (water = 1): 7.14</p>	<p>Solubility in water: reaction Vapour pressure, kPa at 487°C: 0.1 Auto-ignition temperature: 460°C</p>
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<p>ENVIRONMENTAL DATA</p>	
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NOTES

Zinc may contain trace amounts of arsenic, when forming hydrogen, may also form toxic gas arsine (see ICSC 0001 and ICSC 0222). Reacts violently with fire extinguishing agents such as water, halons, foam and carbon dioxide. The symptoms of metal fume fever do not become manifest until several hours later. Rinse contaminated clothes (fire hazard) with plenty of water.

Transport Emergency Card: TEC (R)-43GWS-II+III
NFPA Code: H0; F1; R1;

ADDITIONAL INFORMATION

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ICSC: 1205

ZINC POWDER

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APPENDIX D
HOSPITAL INFORMATION AND MAP
FIELD ACCIDENT REPORT

FIELD ACCIDENT REPORT

This report is to be filled out by the designated Site Safety Officer after EVERY accident.

PROJECT NAME _____ PROJECT. NO. _____

Date of Accident _____ Time _____ Report By _____

Type of Accident (Check One):

Vehicular Personal Property

Name of Injured _____ DOB or Age _____

How Long Employed _____

Names of Witnesses _____

Description of Accident _____

Action Taken _____

Did the Injured Lose Any Time? _____ How Much (Days/Hrs.)? _____

Was Safety Equipment in Use at the Time of the Accident (Hard Hat, Safety Glasses, Gloves, Safety Shoes, etc.)? _____

(If not, it is the EMPLOYEE'S sole responsibility to process his/her claim through his/her Health and Welfare Fund.)

INDICATE STREET NAMES, DESCRIPTION OF VEHICLES, AND NORTH ARROW

HOSPITAL INFORMATION AND MAP

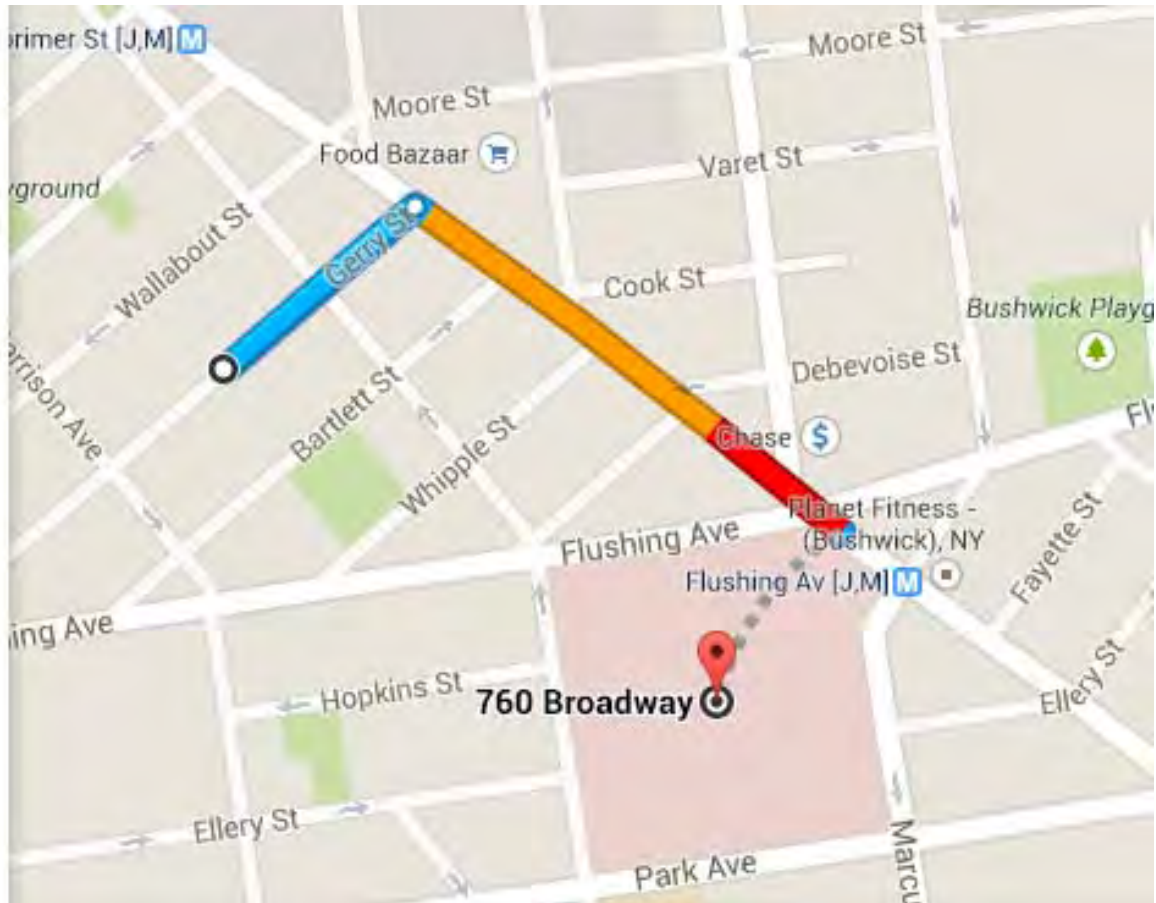
The hospital nearest the site is:

Woodhull Medical Center

760 Broadway, Brooklyn, NY 11206

718-963-8000

0.4 Mile – About 4 Minutes



START: 85 Gerry St, Brooklyn, NY 11206

- 1) Head northeast on Gerry St toward Throop Ave (0.1 mi)
- 2) Turn right onto Broadway (0.2 mi)
- 3) Destination will be on the right

FINISH: 760 Broadway, Brooklyn, NY 11206

APPENDIX D
Community Air Monitoring Plan

COMMUNITY AIR MONITORING PLAN

FORMER PFIZER PROPERTY
SITE B - OPERABLE UNIT 2

177 HARRISON STREET AND GERRY STREET
BROOKLYN NEW YORK
Block 2266 Lots 1 and 52

MAY 2018

**FORMER PFIZER PROPERTY
SITE B - OPERABLE UNIT 3**

**COMMUNITY AIR MONITORING PLAN
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APPENDICES

Appendix A Action Limit Report

1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) has been prepared for use during activities that disturb the cover systems on Block 2266 Lots 1 and 52 at 177 Harrison Avenue and Gerry Street, Brooklyn NY. The CAMP provides measures for protection for the on-site works and building occupants and downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved in the investigation activities) from potential airborne contaminant releases resulting from investigative activities at the site.

Compliance with this CAMP is required during all activities associated with drilling and sampling activities that have the potential to generate airborne particulate matter and volatile organic compounds (VOCs). These activities include drilling and soil and groundwater sampling. This CAMP has been prepared to ensure that investigation activities do not adversely affect passersby, residents, or workers in the area immediately surrounding the Site and to preclude or minimize airborne migration of investigation-related contaminants to off-site areas.

1.1 Regulatory Requirements

This CAMP was established in accordance with the following requirements:

- New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan as presented in DER-10 Technical Guidance for Site Investigation and Remediation (NYSDEC May 3, 2010). This guidance specifies that a community air-monitoring program shall be implemented to protect the surrounding community and to confirm that the work does not spread contamination off-site through the air;

2.0 AIR MONITORING

Chlorinated volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals are the constituents of concern at the Site. The appropriate method to monitor air for these constituents during remediation activities is through real-time VOC and air particulate (dust) monitoring.

2.1 Meteorological Data

At a minimum, wind direction will be evaluated at the start of each workday, noon of each workday, and the end of each workday. These readings will be utilized to position the monitoring equipment in appropriate upwind and downwind locations.

2.2 Community Air Monitoring Requirements

To establish ambient air background concentrations, air will be monitored at several locations around the site perimeter before activities begin. These points will be monitored periodically in series during the site work. When the drilling area is within 20 feet of potentially exposed populations or occupied structures, the perimeter monitoring points will be located to represent the nearest potentially exposed individuals at the downwind location.

Fugitive respirable dust will be monitored using a MiniRam Model PDM-3 aerosol monitor (or equivalent). Air will be monitored for VOCs with a portable MiniRAE 3000 photoionization detector (PID), or equivalent. All air monitoring data will be documented in a site log book by the designated site safety officer. The site safety officer or delegate must ensure that air monitoring instruments are calibrated and maintained in accordance with manufacturer's specifications. All instruments will be zeroed daily and checked for accuracy. A daily log will be kept. If additional monitoring is required, the protocols will be developed and appended to this plan

3.0 VOC MONITORING, RESPONSE LEVELS, AND ACTIONS

Volatile organic compounds (VOCs) will be monitored within the work area and at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present.

The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should 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 must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can 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 must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can 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 must be shutdown. All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

All readings will be recorded and made available for NYSDEC and NYSDOH personnel to review. If an exceedance of the Action Limits occurs, an Action Limit Report, as shown in Appendix A, will be completed.

3.1 Potential Corrective Measures and VOC Suppression Techniques

If the 15-minute integrated VOC level at the downwind location persists at a concentration that exceeds the upwind level by more than 5 ppm but less than 25 ppm during remediation activities, then vapor suppression techniques will be employed. The following techniques, or others, may be employed to mitigate the generation and migration of fugitive organic vapors:

- Collection of purge water in covered containers;
- storage of excess sample and drill cuttings in drums or covering with plastic

4.0 PARTICULATE MONITORING

Air monitoring for particulates (i.e., dust) will be performed continuously during drilling activities using both air monitoring equipment and visual observation at upwind and downwind locations. Monitoring equipment capable of measuring particulate matter smaller than 10 microns (PM₁₀) and capable of integrating (averaging) over periods of 15 minutes or less will be set up at upwind (i.e., background) and downwind locations, at heights approximately four to five feet above land surface (i.e., the breathing zone). Monitoring equipment will be MIE Data Ram monitors, or equivalent. The audible alarm on the particulate monitoring device will be set at 90 micrograms per cubic meter (µg/m³). This setting will allow proactive evaluation of worksite conditions prior to reaching the action level of 100 µg/m³ above background. The monitors will be calibrated at least once per day prior to work activities and recalibrated as needed thereafter. In addition, fugitive dust migration will be visually assessed during all intrusive work activities.

The following summarizes particulate action levels and the appropriate responses:

- If the downwind PM-10 particulate level is 100 µg/m³ greater than background (upwind perimeter) for the 15-minute period, or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 µg/m³ 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 µg/m³ above the upwind level, work must be stopped and an evaluation of activities initiated. Work can resume provided that dust suppression measures (as described in Section 2.3.1 below) and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 µg/m³ of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for NYSDEC and NYSDOH personnel to review. If an exceedance of the Action Limits occurs, an Action Limit Report as shown in **Appendix A** will be completed.

4.1 Potential Particulate Suppression Techniques

If the integrated particulate level at the downwind location exceeds the upwind level by more than 100 µg/m³ at any time during drilling activities, then dust suppression techniques will be employed. The following techniques, or others, may be employed to mitigate the generation and migration of fugitive dusts:

- Placement of drill cuttings in drums or covering stockpiles with plastic;
- Misting of the drilling area with a fine water spray from a hand-held spray bottle

Work may continue with dust suppression techniques provided that downwind PM₁₀ levels are not more than 150 µg/m³ greater than the upwind levels.

There may also be situations where the dust is generated by drilling activities and migrates to downwind locations, but is not detected by the monitoring equipment at or above the action level. Therefore, if dust is observed leaving the working area, dust suppression techniques such as those listed above will be employed.

If dust suppression techniques do not lower particulates to below $150 \mu\text{g}/\text{m}^3$, or visible dust persists, work will be suspended until appropriate corrective measures are identified and implemented to remedy the situation.

All air monitoring readings will be recorded in the field logbook and will be available for the NYSDEC and NYSDOH personnel to review.

5.0 DATA QUALITY ASSURANCE

5.1 Calibration

Instrument calibration shall be documented on instrument calibration and maintenance sheets or in the designated field logbook. All instruments shall be calibrated as required by the manufacturer. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

5.2 Operations

All instruments shall be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment will be maintained on-site by the SSO for reference.

5.3 Data Review

The SSO will interpret all monitoring data based the established criteria and his/her professional judgment. The SSO shall review the data with the PM to evaluate the potential for worker exposure, upgrades/downgrades in level of protection, comparison to direct reading instrumentation and changes in the integrated monitoring strategy.

Monitoring and sampling data, along with all sample documentation will be periodically reviewed by the PM.

6.0 RECORDS AND REPORTING

All air readings must be recorded on daily air monitoring log sheets and made available for review by personnel from NYSDEC and NYSDOH.

Daily Air Monitoring Log

Project Name: Former Pfizer Property - OUIII

Date: _____

Project Location: 81, 83, and 85 Gerry Street, Brooklyn, NY

VCP No: V00350

Temperature: _____

Wind Speed: _____

Wind Direction: _____

Background Data: Upwind - PID _____ppm

Dust Meter 1 - _____mg/m³

Downwind - PID _____ppm

Dust Meter 2 - _____mg/m³

Time	Work Zone		Upwind		Downwind	
	PID - ppm	Dust - mg/m ³	PID - ppm	Dust - mg/m ³	PID - ppm	Dust - mg/m ³

Activities Performed:

APPENDIX E
Vapor Barrier Specifications



April 2, 2012

Wolf Englander
Bais Ruchel High School Inc. C/O UTA
82 Lee Ave.
Brooklyn NY 11211

Dear Sir:

Thank you for considering Raven VaporBlock Plus 20 for you vapor and gas barrier needs. Raven VaporBlock Plus 20 is an excellent choice for redevelopment on a contaminated site and will not be damaged by the chemicals, Tetrachloroethene (PCE) Trichloroethene (TCE), Acetone, Toluene, Benzene, Xylenes, Ethylbenzene, Isopropylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, Carbon tetrachloride, Hexane, n-heptane, 1,1,1-trichloroethane, in the concentrations listed on the "Summary of Detected VOC's In Soil Samples 177 Harrison Ave Brooklyn, New York". Land Science Technologies', publishes a moisture vapor transmission number, Per ASTM E96, of .026 g/sqft/hr for its Geo-Seal product . This converts to .063 us perms or about 10 times greater than the Raven VaporBlock Plus 20. If I can provide any additional information, please send me an e-mail

A handwritten signature in black ink that reads "Dan Smith". The signature is written in a cursive style with a large, looped initial "D".

Dan Smith
Senior Development Engineer
Raven Ind. Inc.
(800) 635-3456
dan.smith@ravenind.com

ENGINEERED FILMS DIVISION



PH: (800) 635-3456 - www.rufco.com - FAX: (605) 331-0333
© 2012 RAVEN INDUSTRIES, INC. All Rights Reserved.

LIMITED WARRANTY

Raven Industries, Inc. warrants its products to be free from defects in materials and workmanship at the time of purchase. The sole remedy for a breach of this limited warranty is repair or replacement, at the sole discretion of Raven, of the product. Replacement or repair of products will only be provided if written notification of the defect is received by Raven within 30 days of purchase. This warranty does not extend to damage done through alterations, mishandling or misuse of the product.

THE WARRANTIES CONTAINED HEREIN ARE EXPRESSLY AGREED TO BE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. EXPRESSLY EXCLUDED AND DISCLAIMED ARE THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES BEYOND THE DESCRIPTION ON THE FACE HEREOF.

RAVEN INDUSTRIES, INC. SHALL NOT IN ANY EVENT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES BY REASON OF ANY WARRANTY CLAIM.

Shipping Damage: All merchandise is carefully packaged to reduce the possibility of damage during shipment. Please report damaged merchandise directly to the carrier who delivered your shipment. Raven is not responsible for damage caused by shipping.

Returned Goods: All sales are final. Only merchandise containing a manufacturing defect will be considered for return. Written permission and authorization for return of any defective merchandise must be obtained before returning merchandise for any cause. Items returned without such written permission will be refused. All returns are subject to Raven Industries inspection, audited disposition at time of receipt.

The parties agree that the enforceability, interpretation, and construction of this agreement shall be governed by South Dakota law.



AMC Engineering

99 Jericho Tpke
Suite 300J
Jericho, NY 11753
Fax 516 706-3214
516.417.8588

February 27, 2014

Mr. Wolf Englander
wolfe@utaw.org

Ref: Inspection Report for the SSDS
177 Harrison Ave, Brooklyn, NY

Dear Mr. Englander:

This is to summarize the inspections conducted so far at the above-referred location.

On or around October 31, 2013, AMC Engineering was retained to conduct inspections of the sub-slab depressurization system (SSDS) being installed at 177 Harrison Ave.

Periodic inspections were conducted since then, and summarized on the attached reports.

I conducted the inspection myself. All installed subslab components of the SSDS, such as pipes, gas permeable aggregate, and vapor barrier, including sealing around penetrations, substantially conforms to approved plans prepared by Langan and depicted on plans SSD-1 through SSD-4, and dated 8/16/2011. As of the last inspection date, 11/29/13, the above-slab elements of the SSDS (riser, fan, etc.), depicted on Langan's plan SSD-5 dated 8/16/2011 remained to be installed and tested.

Please, let me know if you require any additional information.

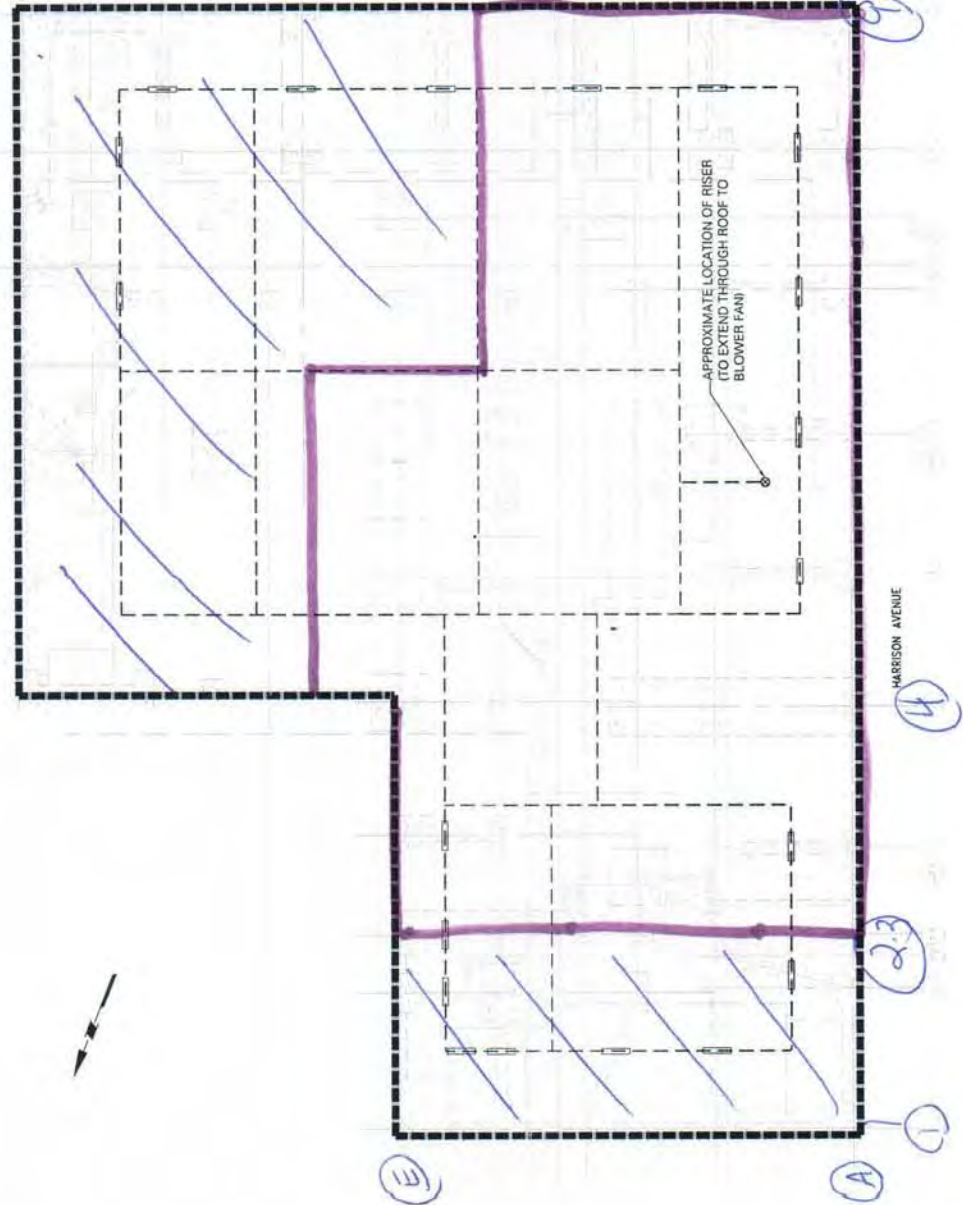
Sincerely,

Ariel Czemerinski, PE
AMC Engineering PLLC



Attachments

(G)



- LEGEND:**
- [Dashed outline] BUILDING OUTLINE (AND APPROXIMATE LATERAL EXTENT OF VAPOR BARRIER AND SUB-SLAB REPRESENTATION SYSTEM)
 - [Dotted line] LOCATION OF SUB-SLAB 4-INCH AIR-RESISTANT HIGH-DENSITY POLYETHYLENE VAPOR BARRIER
 - [Symbol] LOCATION OF 4-INCH METAL RISER PIPE STUB THROUGH GROUND FLOOR BUILDING SLAB (SYMBOL NOT TO SCALE)
 - [Symbol] LOCATION OF SLEEVE AT GRADE BEAM (SYMBOL NOT TO SCALE)

- NOTES:**
- THIS MAP CONFORMS WITH FOUNDATION PLAN (A-100-00) DATED 01/29/10 AND WITH UNDERGROUND PLUMBING PLAN (A-200-00) DATED 02/04/11 PROVIDED BY THE DEVELOPMENT TEAM.
 - SUB-SLAB PERFORATED HDPE PIPE RUN LOCATIONS ARE APPROXIMATE. SUB-SLAB PIPE RUNS WILL BE LOCATED BELOW GROUND FLOOR SLAB.
 - RISER PIPE STUB LOCATION IS APPROXIMATE. RISER PIPE RUNS AND ROOF-TOP SLOTTED LOCATIONS TO BE DESIGNED BY OTHERS.
 - REFER TO FOUNDATION DRAWINGS FOR PIPE SLEEVE AT GRADE BEAM DETAIL.
 - SUB-SLAB REPRESENTATION SYSTEM DETAILS ARE SHOWN ON DRAWINGS 001-2 THROUGH 002-3.

SSDS / VS irregular
 1/22/15
 Alexander



Warning: It is a violation of the NYS Education Law Article 145 for any person, other than the duly licensed professional engineer, to use his or her name after this firm in any way.



21 Park Place
 30th Floor
 New York, NY 10002-2277
 P 212-279-5202 F 212-279-5244
 WWW.ELANGAN.COM FAX 212-279-5222

PROJECT
 177 HARRISON AVE.
 BROOKLYN, NEW YORK

DRAWING TITLE
 SSDS LAYOUT

DRAWING No.
 Project No. 10001701
 Date 02/22/11
 Scale 1"=10'
 Unit: Feet
 Unit Formed 08/10/11
 Drawing No. SSD-1

2/2



AMC Engineering
99 Jericho Turnpike
Suite 300J
Jericho, NY 11753
Fax 516 706-3214
516.417.8588

Location: UTAW

Date: 11/25/13-12:00pm-1:30pm

SSDS INSPECTION REPORT

Inspection Location: Vapor Barrier and SSDS Inspection

Weather: __

Inspection Witnessed by: Eli, Wolf (UTAW)

SSDS Inspection Milestones

1. Completion of Sub base preparation following foundation and footing installation and installation of geotextile	
2. Delivery to the site of gas permeable aggregate layer, prior to use	
3. Installation of sub-slab depressurization pipe and riser "stub-outs" prior to completion of gas permeable aggregate layer	
4. Completion of installation of gas permeable aggregate layer	
5. Completion of all SSDS subsurface components prior to installation of gas vapor barrier above gas permeable aggregate layer	
6. Completion of installation of all portions of interior risers prior to enclosure within sheetrock/interior walls	
7. Inspection of Vapor Barrier: Installation, seal around penetrations.	Inspected Vapor Barrier prior to completing rebar installation
8. Installation of suction fans and accessories in accordance with Specs	

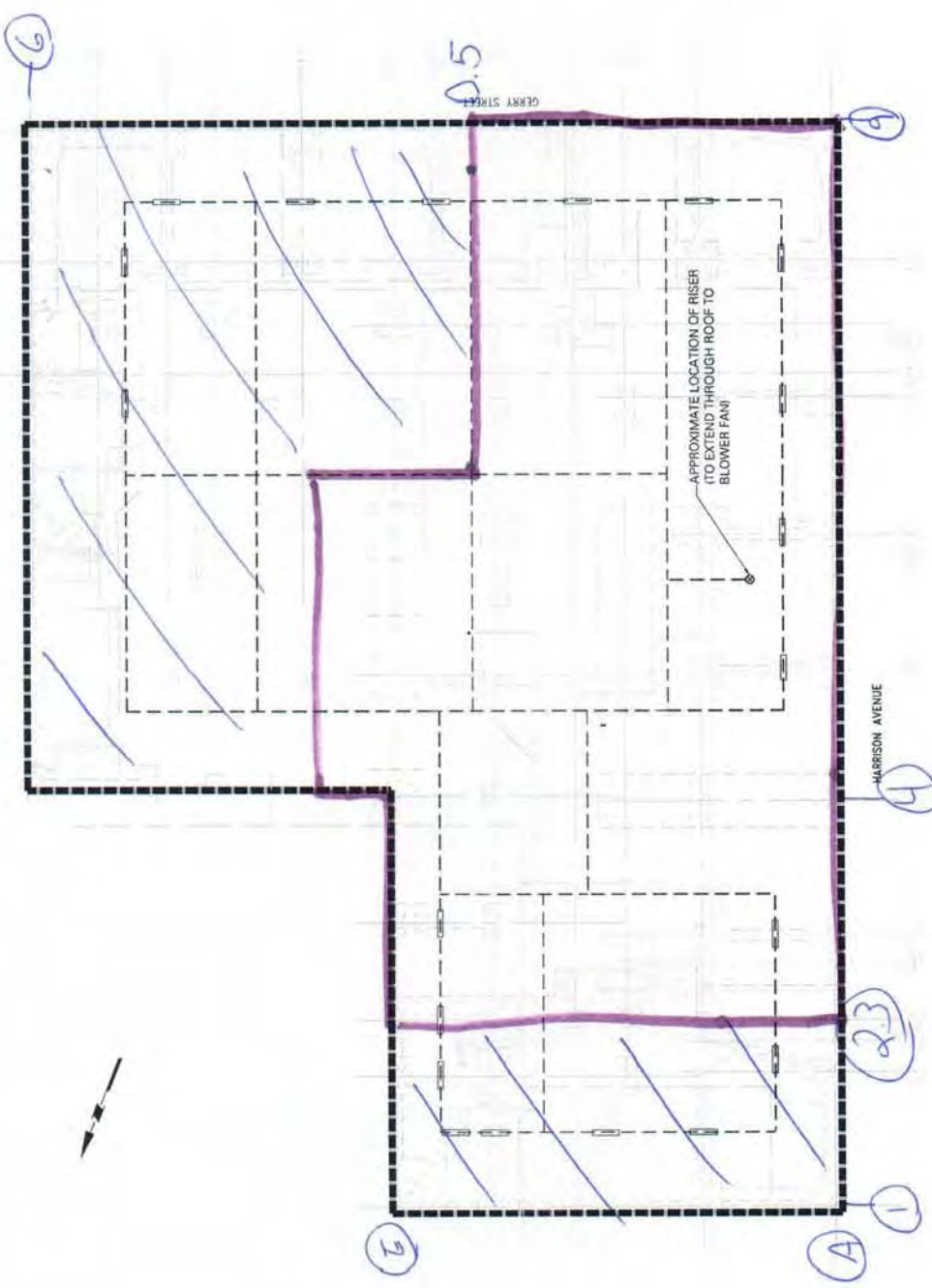
Notes:

Walk through with Eli - Gridlines 1-2.3, A-E & 4-9, D.5-G

By: Ariel Czemerinski



1/2



LEGEN

- BEARING STRUCTURE (AND APPROXIMATE LATERAL EXTENT OF VAPOR BARRIER AND SUB-SLAB REPERFORATION SYSTEM)
- LOCATION OF SUB-SLAB 4-INCH # PERFORATED HIGH DENSITY POLYETHYLENE (HDPE) VAPOR BARRIER (SYMBOL NOT TO SCALE)
- LOCATION OF 4-INCH # METAL RISER PIPE STEUB THROUGH GROUND FLOOR BUILDING SLAB (SYMBOL NOT TO SCALE)
- LOCATION OF SLEEVE AT DRAIN BEAM (SYMBOL NOT TO SCALE)

NOTES

1. THIS PLAN COMPLETES THE FOUNDATION PLAN FOR THE SSDS. THE SSDS AND ASSOCIATED UNDERGROUND DRAINAGE PLAN P-20200 DATED 02/04/11 PROVIDED BY THE DEVELOPMENT TEAM.
2. SUB-SLAB REPERFORATED RISER PIPE RUN LOCATIONS ARE APPROXIMATE. SUB-SLAB PIPE RUNS WILL BE LOCATED BELOW GROUND FLOOR SLAB.
3. RISER PIPE STEUB LOCATION IS APPROXIMATE. RISER PIPE RUNS AND ROOF-TOP BLOWER LOCATIONS TO BE DETERMINED BY OTHERS.
4. REFER TO FOUNDATION DRAWINGS FOR PIPE SLEEVES AT DRAIN BEAM DETAIL.
5. SUB-SLAB REPERFORATION SYSTEM DETAILS ARE SHOWN IN DRAWING 202-1 THROUGH 202-5.

SSDS/VA Injection
1/25/15
Alem



Warning: It is a violation of the NYS Education Law Article 145 for any person, unless he is acting under the direction of a duly licensed professional engineer, to alter this form in any way.

Date: _____

Preparation: _____

Scale: _____

Professional Seal & License No. of the Engineer: _____

ELANGAN
INCORPORATED IN THE STATE OF NEW YORK
21 Park Road
300 West 31st Street 20th Floor
New York, NY 10001
P 212.476.3400 F 212.476.3444
WWW.ELANGAN.COM

Project: 177 HARRISON AVE. NEW YORK
CITY

SSDS LAYOUT

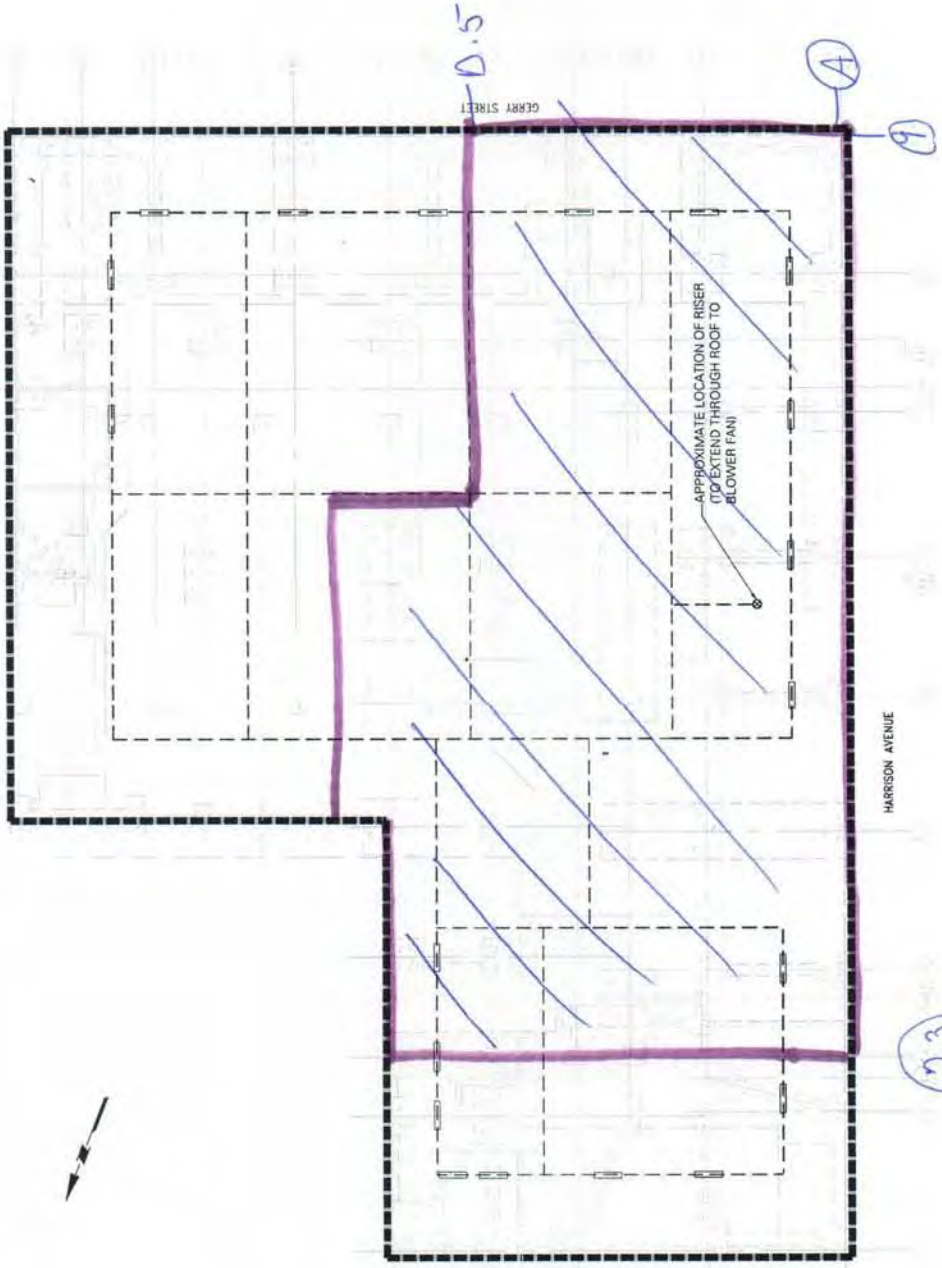
Project No.	19998798	Quantity No.	SSD-1
Date	02/27/2011	Scale	1"=10'
Drawn By	WAT	Sheet Reviewed	06/16/2011
Checked By		Quantity	01

LEGEND

- BUILDING OUTLINE (AND APPROXIMATE LATERAL EXTENT AND LOCATION OF BARRETS AND SUB-SLAB DEPRESSURIZATION SYSTEM)
- - - - - LOCATION OF SUB-SLAB 4-INCH # 4 PERFORATED HIGH DENSITY POLYETHYLENE (HDPE) PIPE (SYMBOL NOT TO SCALE)
- ⊗ LOCATION OF 4-INCH # 4 METAL RISER PIPE STUB THROUGH GROUND FLOOR BELOW SLAB (SYMBOL NOT TO SCALE)
- ⊏ LOCATION OF 4-INCH # 4 METAL RISER PIPE STUB THROUGH GROUND FLOOR BELOW SLAB (SYMBOL NOT TO SCALE)

NOTES

1. BASE MAP COMPILED WITH FOUNDATION PLAN FD-10000 DATED 07/29/70 AND WITH UNDERGROUND PLUMBING PLAN P-200100 DATED 07/24/71 PROVIDED BY THE DEVELOPMENT TEAM.
2. SUB-SLAB PERFORATED HDPE PIPE RUN LOCATIONS ARE APPROXIMATE. SUB-SLAB PIPE RUNS WILL BE LOCATED BELOW GROUND FLOOR SLAB.
3. RISER PIPE STUB LOCATION IS APPROXIMATE. RISER PIPE RUNS AND RISER-TO-FLOOR LOCATIONS TO BE DETERMINED BY OWNER.
4. REFER TO FOUNDATION DRAWINGS FOR PIPE TIEBACK AT GRADE BEAM DETAILS.
5. SUB-SLAB DEPRESSURIZATION SYSTEM DETAILS ARE SHOWN ON DRAWINGS SSD-2 THROUGH SSD-5.



SSDS/VB in garden
11/14/13

Agreed



Warning: It is a violation of the NYS Professional Engineering Law for any person to act as a Professional Engineer, or to offer to act as a Professional Engineer, unless he is acting under the direction of a licensed Professional Engineer, to whom he has been assigned after this item in any way.



Project
177 HARRISON AVE.
NEW YORK, NEW YORK
10022

Drawings Title
SSDS LAYOUT

Project No.	10091791	Drawings No.	SSD-1
Date	02/27/11	Scale	1"=10'
Drawn By	WAT	Check By	WAT
Last Revised	08/10/11	CD	CD



AMC Engineering
 99 Jericho Turnpike
 Suite 300J
 Jericho, NY 11753
 Fax 516 706-3214
 516.417.8588

Location: UTAW

Date: 11/6/13-2:00pm-3:00pm

SSDS INSPECTION REPORT

Inspection Location: Vapor Barrier and SSDS Inspection

Weather: Cloudy, 60°F, rainy

Inspection Witnessed by: Eli, Wolf (UTAW)

SSDS Inspection Milestones

1. Completion of Sub base preparation following foundation and footing installation and installation of geotextile	See notes
2. Delivery to the site of gas permeable aggregate layer, prior to use	
3. Installation of sub-slab depressurization pipe and riser "stub-outs" prior to completion of gas permeable aggregate layer	
4. Completion of installation of gas permeable aggregate layer	
5. Completion of all SSDS subsurface components prior to installation of gas vapor barrier above gas permeable aggregate layer	See notes
6. Completion of installation of all portions of interior risers prior to enclosure within sheetrock/interior walls	
7. Inspection of Vapor Barrier: Inspection, seal around penetrations.	See notes
8. Installation of suction fans and accessories in accordance with specs	

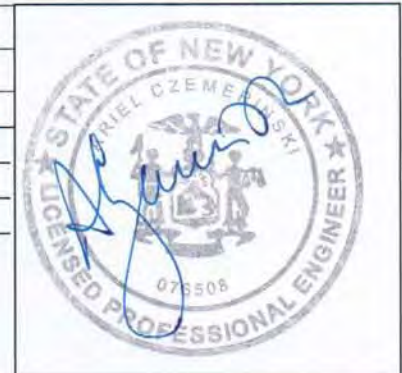
Notes:

Inspected full area – all covered with vapor barrier as per specs.

Identified a few areas with perforations that needed to be sealed.

Walk through with Eli.

By: Ariel Czemerinski





AMC Engineering
 99 Jericho Turnpike
 Suite 300J
 Jericho, NY 11753
 Fax 516 706-3214
 516.417.8588

Location: UTAW

Date: 10/31/2013-12:00pm-2pm

SSDS INSPECTION REPORT

Inspection Location: Vapor Barrier and SSDS Inspection

Weather: Cloudy, 60°F, rainy

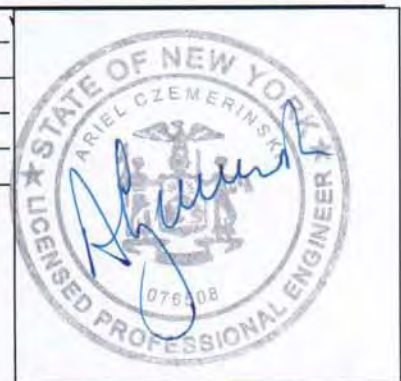
Inspection Witnessed by: Eli, Wolf (UTAW)

SSDS Inspection Milestones

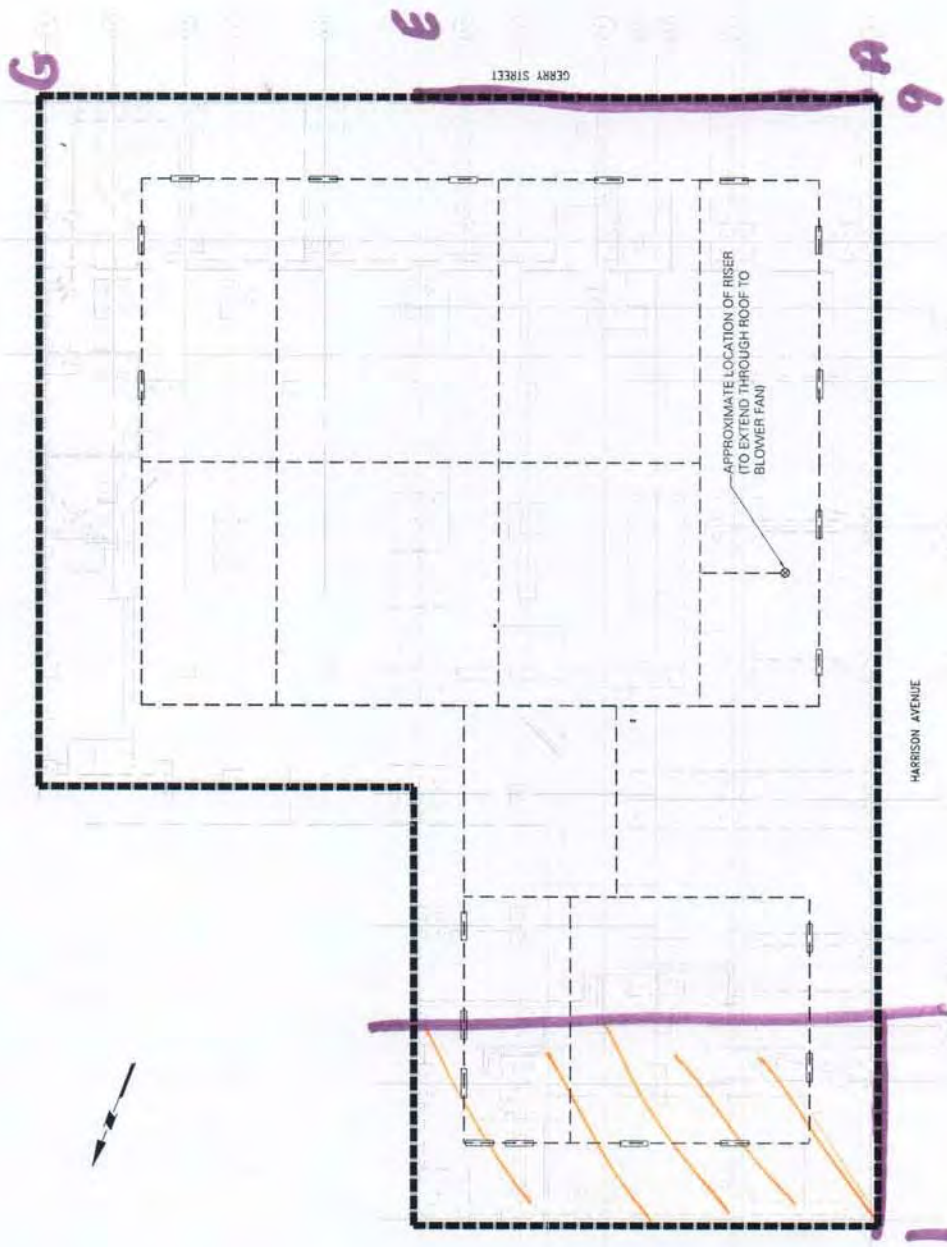
1. Completion of Sub base preparation following foundation and footing installation and installation of geotextile	Examined in area gridlines (1-2.3, A-E)
2. Delivery to the site of gas permeable aggregate layer, prior to use	Observed GPA installed
3. Installation of sub-slab depressurization pipe and riser "stub-outs" prior to completion of gas permeable aggregate layer	Installation as per spec plans
4. Completion of installation of gas permeable aggregate layer	Not Completed
5. Completion of all SSDS subsurface components prior to installation of gas vapor barrier above gas permeable aggregate layer	All pipes installed except some awaiting the filter fabric
6. Completion of installation of all portions of interior risers prior to enclosure within sheetrock/interior walls	
7. Inspection of Vapor Barrier: Inspection, seal around penetrations.	Not completed – indicated the need to meet the Vapor Barrier from the elevator pit wall to the SS VB
8. Installation of suction fans and accessories in accordance with specs	

Notes:

By: Ariel Czemerinski



1/2



LEGEND

- BLLOWING OUTLINE (AND APPROXIMATE LATERAL EXTENT OF BLOWING) AND SUB-SLAB DEPRESSURIZATION SYSTEM
- - - LOCATION OF SUB-SLAB 4-INCH # REINFORCED HIGH DENSITY POLYETHYLENE (HDPE) PIPE (SYMBOL NOT TO SCALE)
- ⊗ LOCATION OF 4-INCH # METAL RISER PIPE SLUR THROUGH SUB-SLAB (SYMBOL NOT TO SCALE)
- ▭ LOCATION OF SLEEVES AT GRADE BEAM (SYMBOL NOT TO SCALE)

NOTES

1. BASE MAP COMPILED WITH FOUNDATION PLAN 10-100-00 DATED 01/29/10 AND WITH UNDERGROUND PLUMBING PLAN P-200-00 DATED 02/24/11 PROVIDED BY THE DEVELOPER/CLIENT.
2. SUB-SLAB REINFORCED HDPE PIPE NON-LOCATIONS ARE APPROXIMATE LOCATIONS OF THE PIPE. THE EXACT LOCATION OF THE PIPE SHALL BE DETERMINED BY THE CONTRACTOR'S FIELD SURVEYING AND ROOF-TOP BLOWER LOCATIONS TO BE DETERMINED BY OTHERS.
3. REFER TO FOUNDATION DRAWINGS FOR PIPE SLEEVES AT GRADE BEAM DETAIL.
4. SUB-SLAB DEPRESSURIZATION SYSTEM DETAILS ARE SHOWN ON DRAWINGS SSD-2 THROUGH SSD-5.

SSDS + UB
 Inspector
 10/31/13



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

Warning: It is a violation of the NYS Education Law Article 142 for any person, unless he is acting under the direction of a duly Licensed Professional Engineer, to alter this plan in any way.

Date	Description	No.
	REVISED	

NAME: JOHN J. LANGAN, JR. E. License No. 021524
 DATE: 10/31/13

LANGAN
 21 West Plaza
 300 West 134th Street, 8th Floor
 New York, NY 10027
 P: 212.476.2400 F: 212.476.2444
 www.langan.com

Project: 177 HARRISON AVE.
 BROOKLYN, NEW YORK

SSDS LAYOUT

Project No: 13067201
 Drawing No: SSD-1
 Date: 07/29/11
 Scale: 1" = 32'
 Dwn. By: VMT
 LAST REVISION: 04/02/11
 OF

2/2



AMC Engineering
 99 Jericho Turnpike
 Suite 300J
 Jericho, NY 11753
 Fax 516 706-3214
 516.417.8588

Location: UTAW
 Date: 10/31/2013-12:00pm-2pm

SSDS INSPECTION REPORT

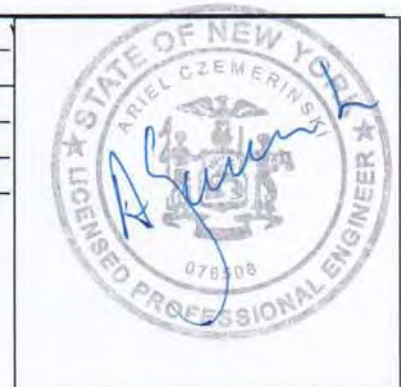
Inspection Location: Vapor Barrier and SSDS Inspection
 Weather: Cloudy, 60°F, rainy
 Inspection Witnessed by: Eli, Wolf (UTAW)

SSDS Inspection Milestones

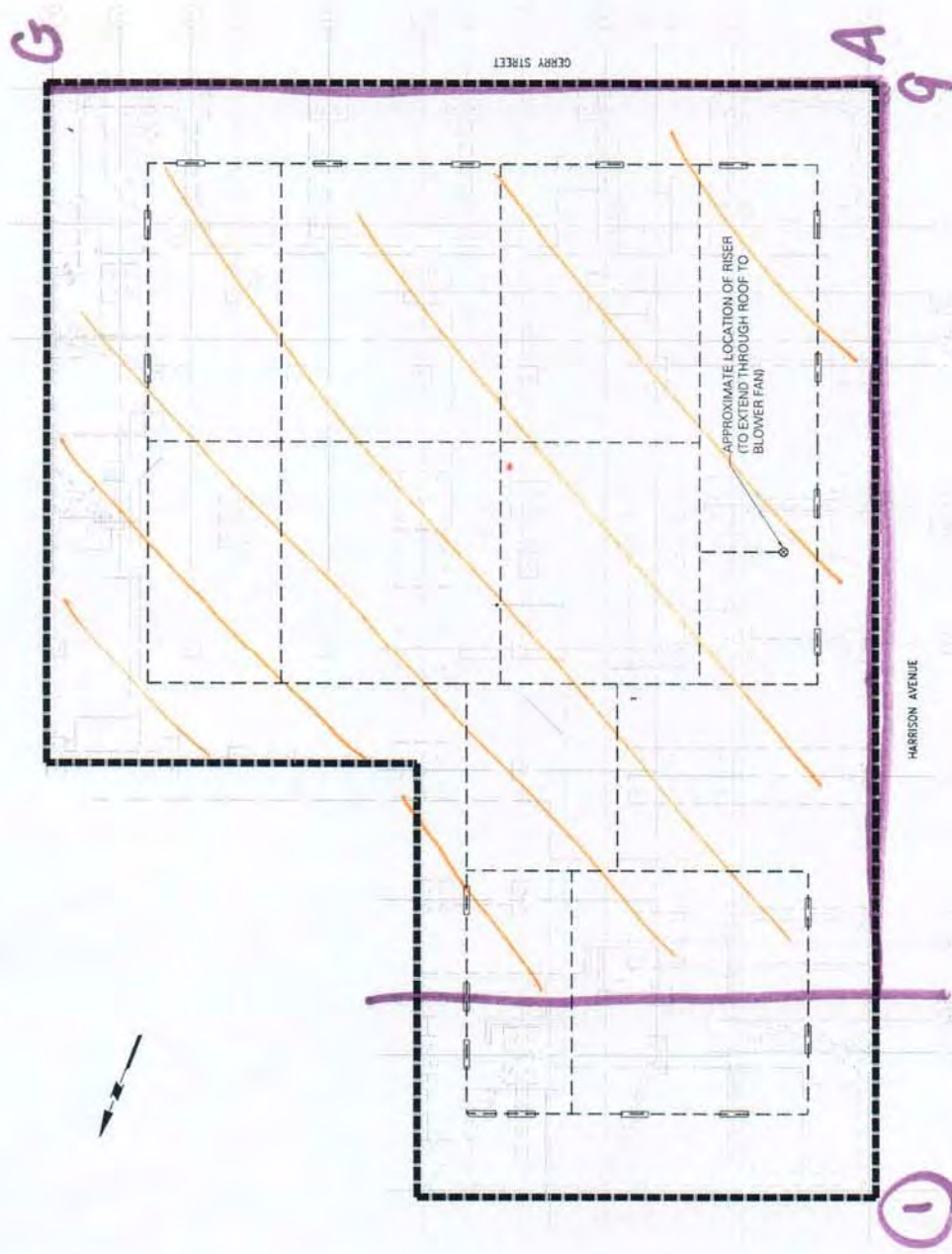
1. Completion of Sub base preparation following foundation and footing installation and installation of geotextile	Examined in area gridlines (2.3-9,A-G) and documentary evidence of installation. All installed as per SSD-1 plan and specs.
2. Delivery to the site of gas permeable aggregate layer, prior to use	
3. Installation of sub-slab depressurization pipe and riser "stub-outs" prior to completion of gas permeable aggregate layer	
4. Completion of installation of gas permeable aggregate layer	
5. Completion of all SSDS subsurface components prior to installation of gas vapor barrier above gas permeable aggregate layer	
6. Completion of installation of all portions of interior risers prior to enclosure within sheetrock/interior walls	
7. Inspection of Vapor Barrier: Inspection, seal around penetrations.	All VB installed and penetrations sealed as per specs
8. Installation of suction fans and accessories in accordance with specs	

Notes:

By: Ariel Czemerinski



1/2



LEGEND

- BEARING, FUTURE (AND APPROXIMATE LATERAL EXTENT OF BEARING AND SUB-SLAB DEPRECUSSATION SYSTEM)
- LOCATION OF SUB-SLAB DRAIN & PERFORATED HIGH DENSITY POLYETHYLENE (HDPE) PIPE (SYMBOL NOT TO SCALE)
- LOCATION OF 4-INCH METAL RISER PIPE SLAB THROUGH (SYMBOL NOT TO SCALE)
- LOCATION OF SLEEVE AT GRADE BEAM (SYMBOL NOT TO SCALE)

NOTES

1. BASE MAP COMPILED WITH FOUNDATION PLAN 10-100-00 DATED 01/29/00 AND WITH UNDERGROUND PLUMBING PLAN P-000-00 DATED 02/06/01 PROVIDED BY THE DEVELOPMENT TEAM.
2. SUB-SLAB PERFORATED HDPE PIPE WITH LOCATIONS ARE APPROXIMATE AND NOT TO SCALE. THE EXACT LOCATION OF THE PERFORATED HDPE PIPE SHALL BE DETERMINED BY THE FIELD INSPECTOR.
3. RISER PIPE SHALL BE APPROXIMATELY 4 INCH DIA. AND SHALL BE INSTALLED AT THE ROOF-TOP BLOWER LOCATION(S) TO BE DETERMINED BY OTHERS.
4. RISER TO FOUNDATION DRAWINGS FOR PIPE SLEEVES AT GRADE BEAM DETAIL.
5. SUB-SLAB DEPRECUSSATION SYSTEM DETAILS ARE SHOWN ON DRAWINGS SSD-1 THROUGH SSD-3.

SSDS + VB
Inspection
10/31/13



Warning: It is a violation of the NYS Education Law Article 145 for any person, unless he is acting under the direction of a duly licensed professional engineer, to alter this form in any way.

 21 West 51st Street, 8th Floor New York, NY 10019 P: 212-279-2020 F: 212-279-2444 www.elangan.com		Project 177 HARRISON AVE. BROOKLYN, NEW YORK	Drawing Title SSDS LAYOUT	Project No. 170001701 Drawing No. SSD-1
Date 10/31/13	Scale 1"=10'	Div. By VMT	Job No. 10002011	Job No. 17

2/2



AMC Engineering
 99 Jericho Turnpike
 Suite 300J
 Jericho, NY 11753
 Fax 516 706-3214
 516.417.8588

Location: UTAW
 Date: 10/25/2013-10:00am-12pm

SSDS INSPECTION REPORT

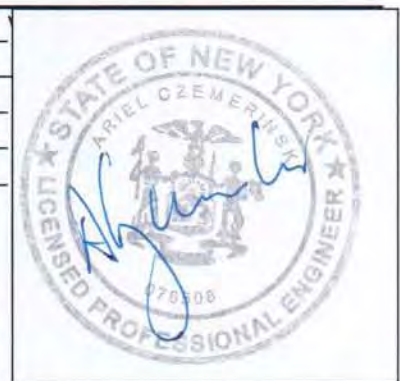
Inspection Location: Vapor Barrier and SSDS Inspection
 Weather: _____
 Inspection Witnessed by: Eli, Wolf (UTAW)

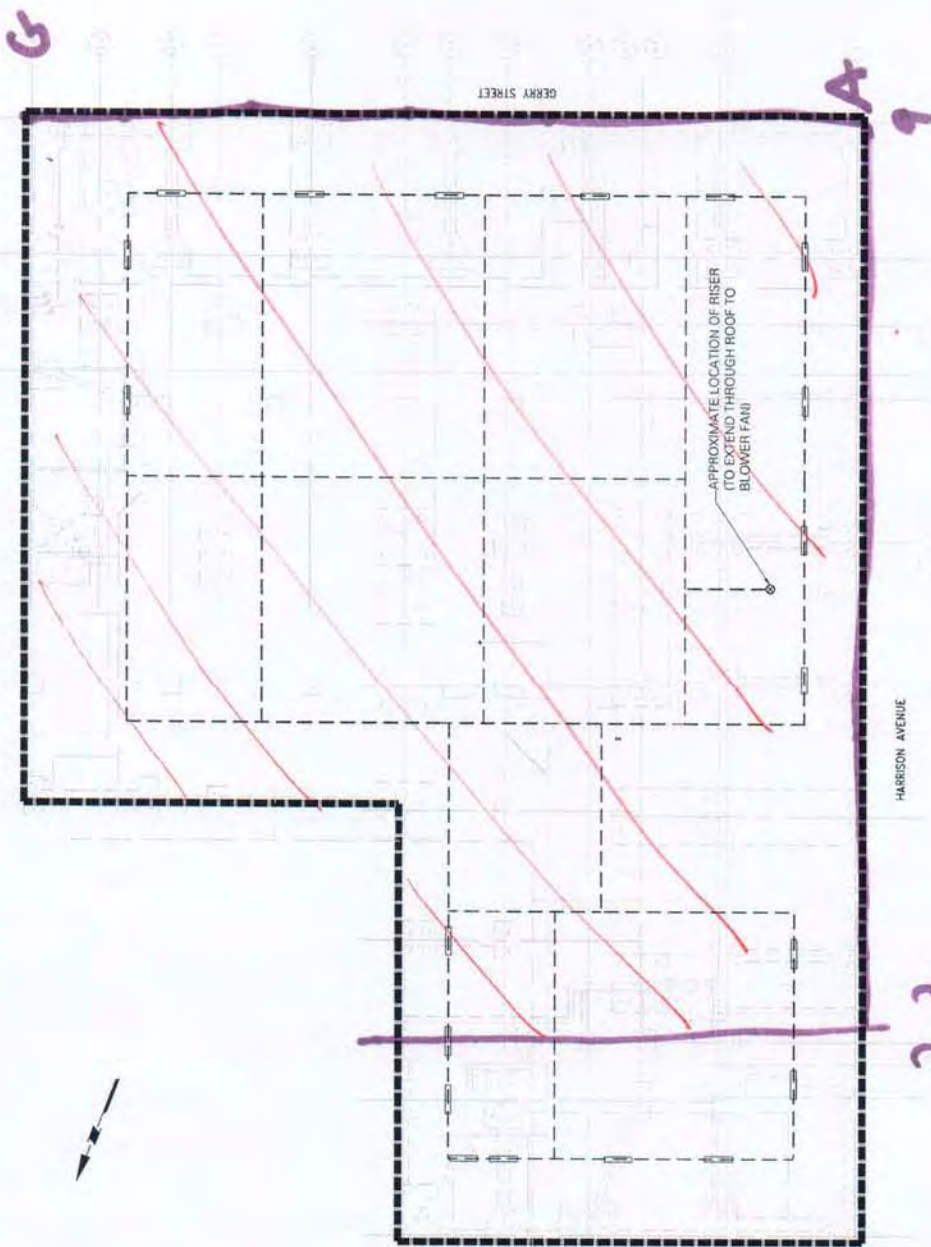
SSDS Inspection Milestones

1. Completion of Sub base preparation following foundation and footing installation and installation of geotextile	Completed gridlines (2.3-9, A-G)
2. Delivery to the site of gas permeable aggregate layer, prior to use	Visual inspection of parts of GPA
3. Installation of sub-slab depressurization pipe and riser "stub-outs" prior to completion of gas permeable aggregate layer	Visual inspection of partially installed SSDS pipes-mostly covered but exposed pipes compliant with specs.
4. Completion of installation of gas permeable aggregate layer	Completed
5. Completion of all SSDS subsurface components prior to installation of gas vapor barrier above gas permeable aggregate layer	Completed for gridlines mentioned above
6. Completion of installation of all portions of interior risers prior to enclosure within sheetrock/interior walls	
7. Inspection of Vapor Barrier: Inspection, seal around penetrations.	Vapor Barrier being installed – Many penetrations remain to be sealed (about 80% installed)
8. Installation of suction fans and accessories in accordance with specs	

Notes:

By: Ariel Czemerinski





LEGEND:

- SEALING OUTLINE (AND APPROXIMATE LATERAL EXTENT OF PIPE BARRELS AND SUB-SLAB DEPRESSURIZATION SYSTEM)
- LOCATION OF SUB-SLAB 4-INCH 9 PERFORATED HIGH DENSITY POLYETHYLENE (HDPE) PAPA (SYMBOL, NOT TO SCALE)
- LOCATION OF 4-INCH 4 METAL RISER PIPE STUB THROUGH DOWNWARD FLOORING SLAB (SYMBOL, NOT TO SCALE)
- LOCATION OF RISER AT GRADE BEAM (SYMBOL, NOT TO SCALE)

NOTES:

1. BASE MAP COMPILED WITH FOUNDATION PLAN (C-1000) DATED 07/29/10 AND WITH UNDERGROUND PLUMBING PLAN (P-2000) DATED 02/04/11 PROVIDED BY THE DEVELOPMENT TEAM.
2. SUB-SLAB PERFORATED HDPE PIPE RUN LOCATIONS ARE APPROXIMATE. SUB-SLAB PIPE RUNS WILL BE LOCATED BELOW GROUND FLOOR SLAB.
3. RISER PIPE STUB LOCATION IS APPROXIMATE. RISER PIPE RUNS AND DOWN-UP SLOPES LOCATIONS TO BE DETERMINED BY OWNERS.
4. REFER TO FOUNDATION DRAWINGS FOR PIPE SLEEVE AT GRADE BEAM DETAILS.
5. SUB-SLAB DEPRESSURIZATION SYSTEM DETAILS ARE SHOWN ON DRAWINGS SSD-2 THROUGH SSD-5.

SSDS & VR
inspection
10/25/13
Alyssa



Warning: It is a violation of the NYS Education Law Article 145 for any person, unless he is acting under the direction of a duly Licensed Professional Engineer, to alter this item in any way.

Date	Description	No.	Name	DATE
	Proposed		PROFESSIONAL: Jeff B. Landa, N.Y. Lic. No. 07124	07/24/13

ELANGAN
 11 Park Avenue, 2nd Floor
 New York, NY 10022-2494
 Tel: 212.378.3400
 Fax: 212.378.3444
 www.elangan.com

PROJECT
 177 HARRISON AVE.
 BROOKLYN, NEW YORK

Drawing Title	Project No.	Drawing No.
SSDS LAYOUT	17001791	001

2/2



Raven Industries, Inc.
 1813 E. Avenue
 Sioux Falls, SD 57104-5931
 Phone: (800) 635-3456
 Phone: (605) 335-0174
 Fax: (605) 331-0333
 E-mail: efdsales@ravenind.com
www.ravenind.com
www.rufco.com
www.vaporblock.com

This MANU-SPEC® utilizes the Construction Specifications Institute (CSI) *Project Resource Manual* (PRM) including *MasterFormat*™, *SectionFormat*™ and *PageFormat*™. A MANU-SPEC is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets []; delete optional text in final copy of specification. Specifier Notes typically precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate symbols typically are used in Specifier Notes; symbols are not used in specification text. Metric conversion, where used, is soft metric conversion.

This MANU-SPEC specifies underslab vapor retarders. These products are manufactured by Raven Industries, Inc. Revise MANU-SPEC section number and title below to suit project requirements, specification practices and section content. Refer to CSI *MasterFormat* for other section numbers and titles.

SECTION 07 26 00
VAPOR RETARDERS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Underslab vapor retarders.

Specifier Note: Revise paragraphs below to suit project requirements. If a reader of this section could reasonably expect to find a product or component specified in this section, but is actually specified elsewhere, then the related section number(s) should be listed in the paragraph below. Add section numbers and titles per CSI *MasterFormat* and specifier's practice. In the absence of related sections, delete paragraph below.

- B. Related Sections:

1. Section 07 26 13 - Above-Grade Vapor Retarders.
2. Section 07 26 16 - Below-Grade Vapor Retarders.

Specifier Note: Article below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain Reference Article when specifying products and installation by an industry reference standard. If retained, list standard(s) referenced in this section. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Conditions of the Contract or Section 01 42 19 - Reference Standards may establish the edition date of standards. This article does not require compliance with standard, but is merely a listing of references used. The article below should list only those industry standards referenced in this section.

1.02 REFERENCES

- A. ASTM International (ASTM):

1. ASTM D1709 Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method.
2. ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials.
3. ASTM E154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls or as Ground Cover.
4. ASTM E1643 Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
5. ASTM E1745 Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under



Concrete Slabs.

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor, either before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Conditions of the Contract and Section [01 33 00 - Submittals Procedures] [_____].

1.03 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Section [01 33 00 - Submittal Procedures] [_____].
- B. Product Data: Submit product data, including manufacturer's SPEC-DATA® sheet, for specified products.
- C. Samples: Submit 8 1/2 inch x 11 inch (216 x 279 mm) samples of specified vapor retarder(s).
- D. Quality Control Submittals:
 - 1. Manufacturer's Instructions: Manufacturer's installation instructions.
- E. Closeout Submittals:
 - 1. Warranty: Manufacturer's standard warranty document. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

Specifier Note: Article below should include prerequisites, standards, limitations and criteria that establish an overall level of quality for products and workmanship for this section. Coordinate article below with Division 01 Quality Assurance Section.

1.04 QUALITY ASSURANCE

Specifier Note: Paragraph below should list obligations for compliance with specific code requirements particular to this section. General statements to comply with a particular code are typically addressed in Conditions of the Contract and Section 01 41 00 - Regulatory Requirements. Repetitive statements should be avoided.

- A. Regulatory Requirements: In accordance with Section [01 41 00 - Regulatory Requirements] [_____].

1.05 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Section [01 61 00 - Common Product Requirements] [_____].
- B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

Specifier Note: Coordinate article below with Conditions of the Contract and with Section 01 78 36 - Warranties.

1.06 WARRANTY

- A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
- B. Manufacturer's Warranty: Submit in accordance with Section [01 78 36 - Warranties] [_____] for Owner's acceptance, manufacturer's standard warranty document. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

PART 2 PRODUCTS

Specifier Note: Retain article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of "or equal" or "or approved equal" or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining "or equal" products.

2.01 VAPOR RETARDERS

Specifier Note: Paragraph below is an addition to CSI *SectionFormat* and a supplement to MANU-SPEC. Retain or delete paragraph below per project requirements and specifier's practice.

- A. Manufacturer: Raven Industries, Inc.

1. Contact: 1813 E. Avenue, Sioux Falls, SD 57104-5931; Telephone: (800) 635-3456, (605) 335-0174; Fax: (605) 331-0333; E-mail: efdsales@ravenind.com; website: www.ravenind.com, www.rufco.com, www.vaporblock.com.

Specifier Note: Retain product(s) below to conform to project requirements. If more than one product is retained, create designators and coordinate with the drawings.

B. VaporBlock 6:

1. Thickness: nominal: 6 mils (0.15 mm).
2. Weight: 29 pounds per thousand square feet (141 grams per square meter).
3. Classification (ASTM E1745): Class C.
4. Tensile Strength, average of machine direction and transverse direction:
 - a. New Material (ASTM E154): 32 pounds per inch (56 N/cm).
 - b. After Soaking (ASTM E154): 25 pounds per inch (44 N/cm).
5. Puncture Resistance (ASTM D1709): 1500 grams.
6. Permeance (ASTM E96, ASTM E154): 0.090 U.S. perms (0.060 metric perms).

C. VaporBlock 10:

1. Thickness: nominal: 10 mils (0.25 mm).
2. Weight: 49 pounds per thousand square feet (240 grams per square meter).
3. Classification (ASTM E1745): Class A.
4. Tensile Strength, average of machine direction and transverse direction:
 - a. New Material (ASTM E154): 52 pounds per inch (91 N/cm).
 - b. After Soaking (ASTM E154): 53 pounds per inch (93 N/cm).
5. Puncture Resistance (ASTM D1709): 2600 grams.
6. Permeance (ASTM E96, E154)(New Material): 0.0146 U.S. perms (0.0096 metric perms).

D. VaporBlock 15:

1. Thickness: nominal: 15 mils (0.38 mm).
2. Weight: 73 pounds per thousand square feet (356 grams per square meter).
3. Classification (ASTM E1745): Class A.
4. Tensile Strength, average of machine direction and transverse direction:
 - a. New Material (ASTM E154): 88 pounds per inch (154 N/cm).
 - b. After Soaking (ASTM E154): 92 pounds per inch (161 N/cm).
5. Puncture Resistance (ASTM D1709): 4000 grams.
6. Permeance (ASTM E96, E154): 0.009 U.S. perms (0.0059 metric perms).

2.02 ACCESSORIES

- A. Seaming Tape: VaporBond Tape by Raven Industries or other 4" (102 mm) wide tape approved by vapor retarder manufacturer.
- B. Pipe Boot Kits: Raven VaporBoot System or other approved Manufacturer's supplied pipe boot system.

2.03 PRODUCT SUBSTITUTIONS

- A. Substitutions: Substitutions in accordance with Section [01 25 13 - Product Substitution Procedures] [No substitutions permitted] [_____].

PART 3 EXECUTION

Specifier Note: Paragraph below is an addition to CSI *SectionFormat* and a supplement to MANU-SPEC. Retain or delete paragraph below per project requirements and specifier's practice.

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton/label instructions for installation. Reference SPEC-DATA Section 5, Installation.

3.02 EXAMINATION

- A. Site Verification of Conditions: Verify that substrate conditions are acceptable for product installation in accordance with manufacturer's instructions.

3.03 INSTALLATION

- A. In accordance with ASTM E1643.

3.04 CLEANUP

- A. Proceed in accordance with Section [01 74 11 - Cleaning] [_____].
- B. Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PRODUCT DESCRIPTION

VaporBlock Plus[™] is a seven-layer co-extruded barrier made from state-of-the-art polyethylene and barrier resins to provide unmatched impact strength as well as superior resistance to gas and moisture transmission. **VaporBlock Plus** 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** is more than 50 times less permeable than typical high-performance polyethylene vapor retarders against Methane, Radon and other harmful VOC's.

VaporBlock Plus is one of the most effective underslab 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 6 (Class C) and 20 (Class A) mil thicknesses designed to meet the most stringent requirements. **VaporBlock Plus** is produced within the strict guidelines of our ISO 9001:2000 Certified Management System.

PRODUCT USE

VaporBlock Plus resists gas and moisture migration into the building envelop when properly installed. It can be installed as 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 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 6 is available in 12' x 200' rolls and **VaporBlock Plus 20** 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.

PRODUCT	PART NUMBER
VaporBlock Plus 6	VBP 6
VaporBlock Plus 20	VBP 20

COMMON APPLICATIONS

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



TECHNICAL DATA SHEET

PROPERTIES	TEST METHOD	VAPORBLOCK PLUS 6		VAPORBLOCK PLUS 20	
		English	Metric	English	Metric
APPEARANCE		White/Black		White/Gold	
THICKNESS, NOMINAL		6 mil	0.15 mm	20 mil	0.51 mm
WEIGHT		28 lbs/MSF	139 g/m ²	102 lbs/MSF	498 g/m ²
CLASSIFICATION	ASTM E 1745	CLASS C		CLASS A, B & C	
TENSILE STRENGTH 1" (2.54 cm) Average MD & TD (New Material)	ASTM E 154 Section 9 (D882)	22 lbs	98 N	58 lbs	258 N
PUNCTURE RESISTANCE	ASTM D 1709 *Method B	800 g		2600 g	
MAXIMUM USE TEMPERATURE		180°F	82°C	180°F	82°C
PERMEANCE (New Material)	ASTM E 154 Section 7 ASTM E 96 Procedure B	0.090 U.S. Perms	0.060 Metric Perms	0.025 U.S. Perms	0.016 Metric Perms
RADON DIFFUSION COEFFICIENT		N/A		< 0.25 x 10 ⁻¹² m ² /s	
METHANE PERMEABILITY	ASTM D 1434	N/A		< 5 x 10 ⁻¹⁰ m ² /d•atm	

*Method B conditioned at 65% humidity for 14 days.

VaporBlock Plus Placement

Instructions on architectural or structural drawings should be reviewed & followed. Detailed installation instructions accompany each roll of **VaporBlock Plus**. ASTM E 1643 also provides general installation information for vapor retarders.



VaporBlock Plus[™] is a seven-layer co-extruded barrier made using high quality virgin-grade polyethylene and barrier resins to provide unmatched impact strength as well as superior resistance to gas and moisture transmission. **VaporBlock Plus** contains a bright white on one side and a metallic gold on the other side.

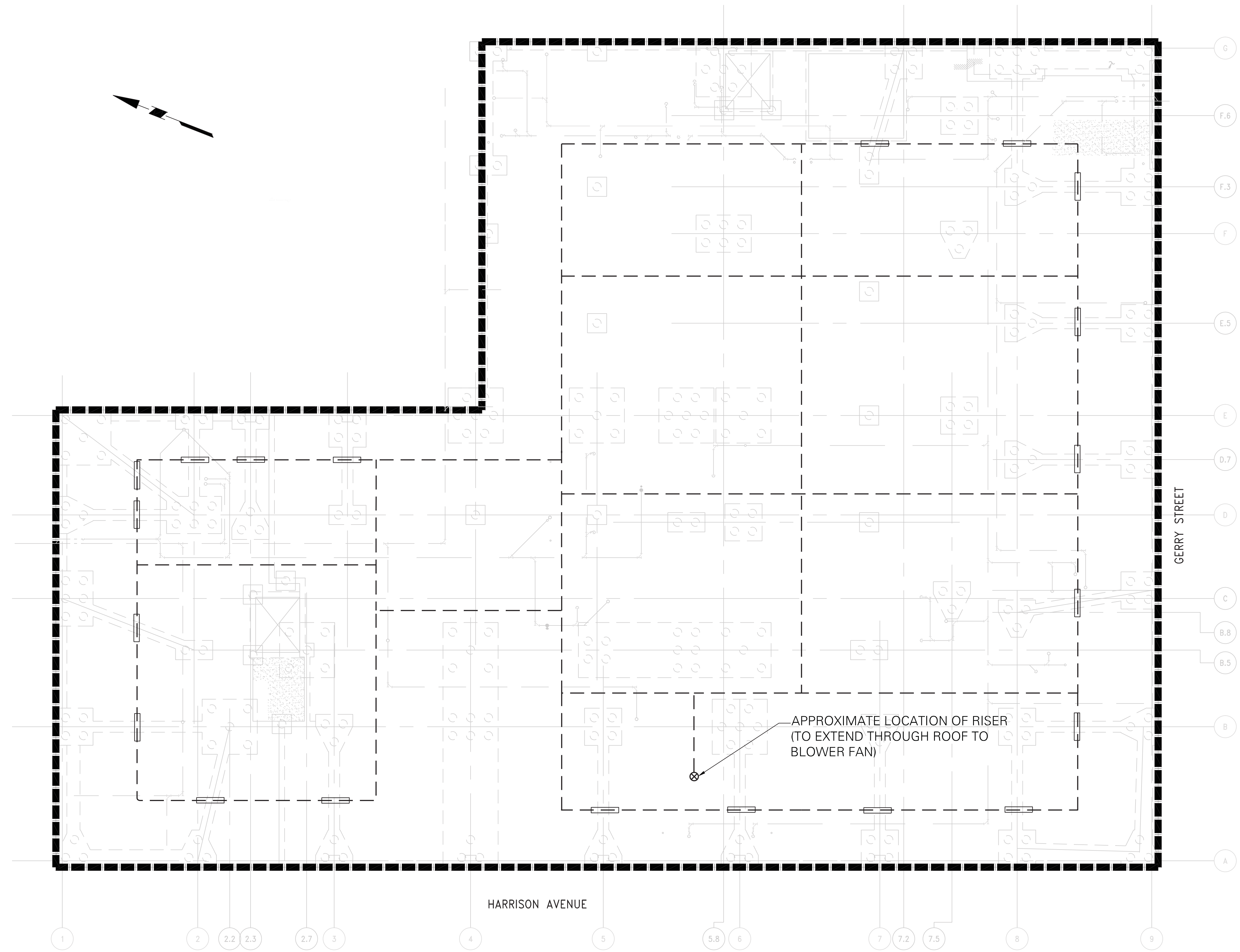
Note: To the best of our knowledge, unless otherwise stated, these are typical property values and are intended as guides only, not as specification limits. NO WARRANTIES ARE MADE AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and disclaims all liability for resulting loss or damage.



ISO 9001:2000
CERTIFIED MANAGEMENT SYSTEM

APPENDIX – F

As-Built SSD System Design

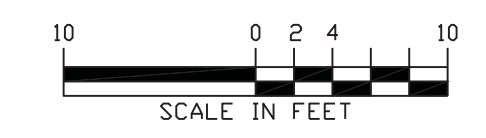


- LEGEND:**
- BUILDING OUTLINE (AND APPROXIMATE LATERAL EXTENT OF VAPOR BARRIER AND SUB-SLAB DEPRESSURIZATION SYSTEM)
 - LOCATION OF SUB-SLAB 4-INCH Ø PERFORATED HIGH DENSITY POLYETHENE (HDPE) PIPE (SYMBOL NOT TO SCALE)
 - LOCATION OF 4-INCH Ø METAL RISER PIPE STUB THROUGH GROUND FLOOR BUILDING SLAB (SYMBOL NOT TO SCALE)
 - LOCATION OF SLEEVE AT GRADE BEAM (SYMBOL NOT TO SCALE)

- NOTES:**
1. BASE MAP COMPILED WITH FOUNDATION PLAN FO-100.00 DATED 01/29/10 AND WITH UNDERGROUND PLUMBING PLAN P-000.00 DATED 02/04/11 PROVIDED BY THE DEVELOPMENT TEAM.
 2. SUB-SLAB PERFORATED HDPE PIPE RUN LOCATIONS ARE APPROXIMATE. SUB-SLAB PIPE RUNS WILL BE LOCATED BELOW GROUND FLOOR SLAB.
 3. RISER PIPE STUB LOCATION IS APPROXIMATE. RISER PIPE RUNS AND ROOF-TOP BLOWER LOCATIONS TO BE DESIGNED BY OTHERS.
 4. REFER TO FOUNDATION DRAWINGS FOR PIPE SLEEVE AT GRADE BEAM DETAIL.
 5. SUB-SLAB DEPRESSURIZATION SYSTEM DETAILS ARE SHOWN ON DRAWINGS SSD-2 THROUGH SSD-5.

Built As Designed

Certified by
 Ariel Czemerinski, PE
 AMC Engineering PLLC
 99 Jericho Turnpike
 Suite 300J
 Jericho, NY 11753
 February 2, 2015



Warning: It is a violation of the NYS Education Law Article 145 for any person, unless he is acting under the direction of a licensed Professional Engineer, to alter this item in any way.

Date	Description	No.	NAME	DATE
	Revisions		PROFESSIONAL Joel B. Landes N.Y. LIC. No. 076348	

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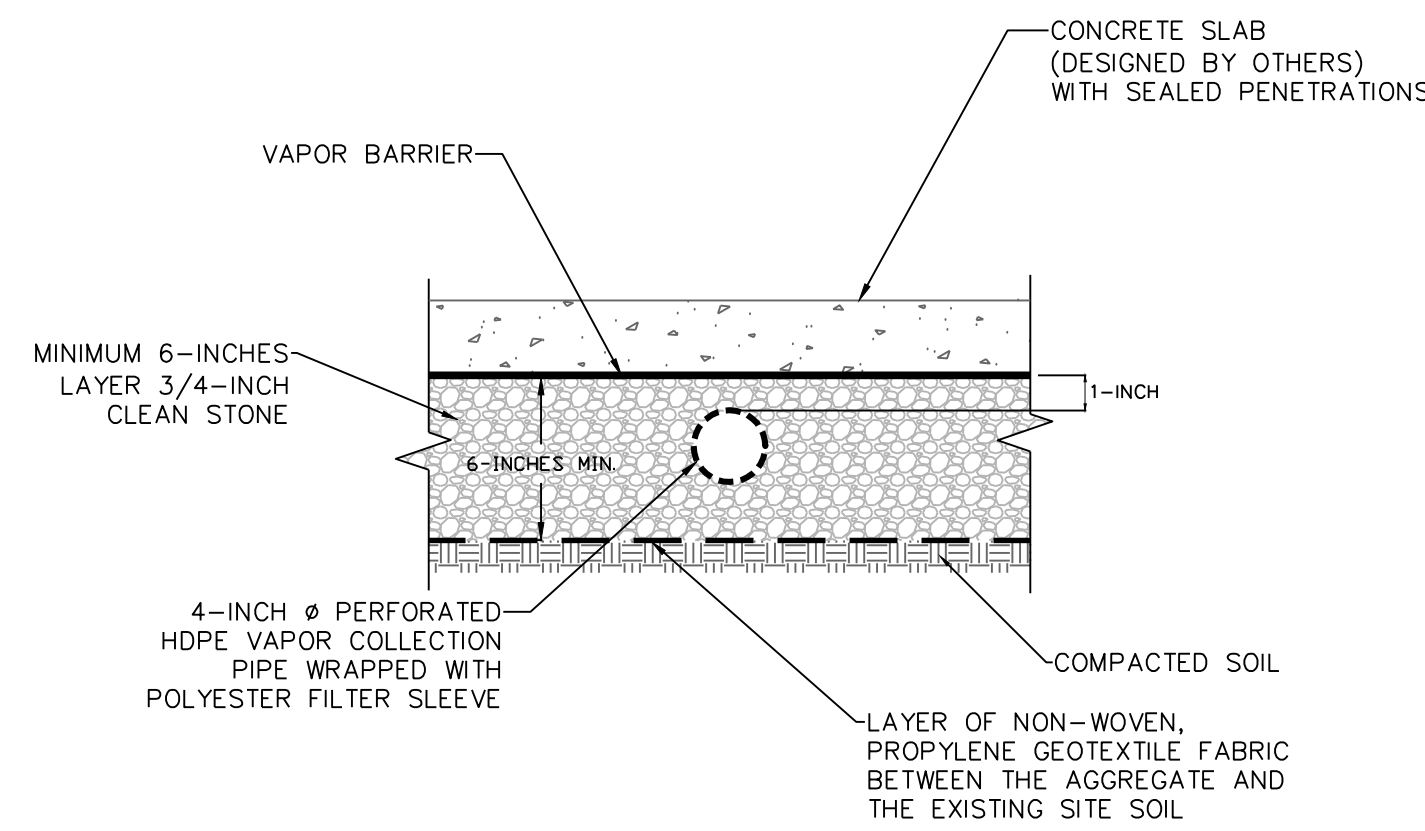
21 Penn Plaza
 360 West 31st Street, 8th Floor
 New York, NY 10001-2727
 P: 212.479.5400 F: 212.479.5444
 www.langan.com

NEW JERSEY PENNSYLVANIA NEW YORK CONNECTICUT FLORIDA
 NEVADA VIRGINIA CALIFORNIA

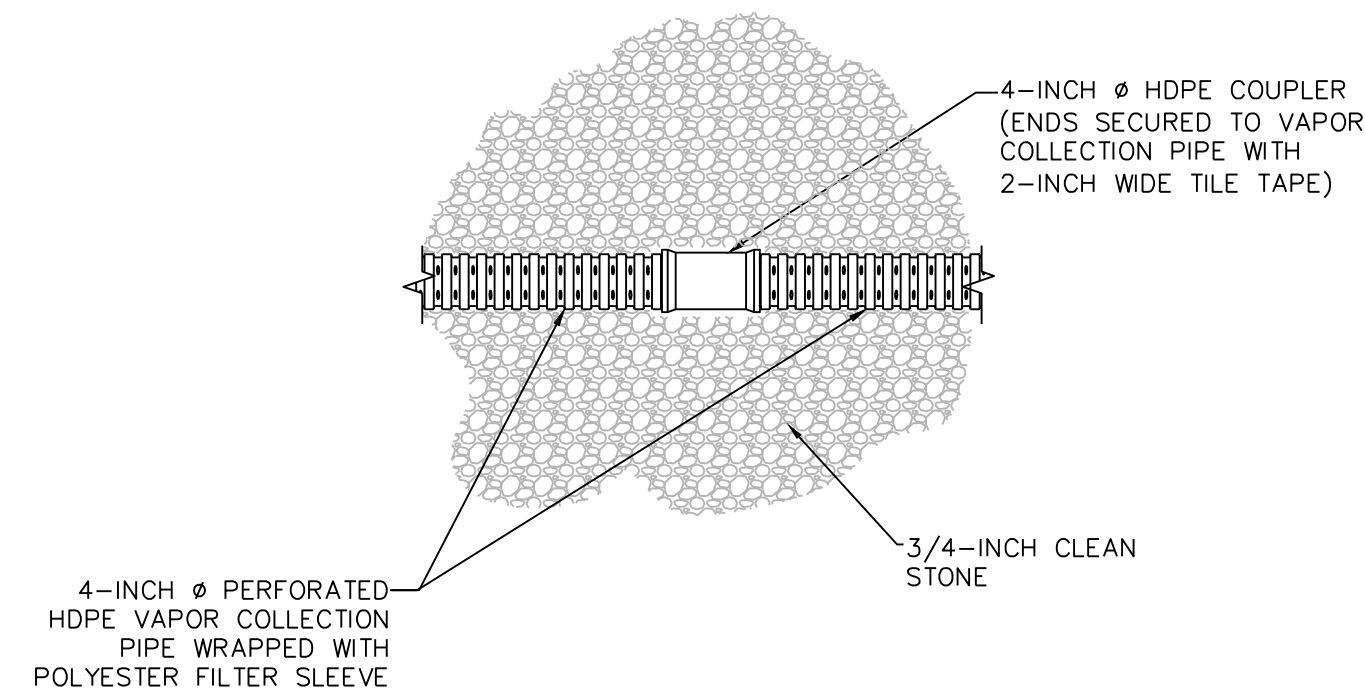
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 BROOKLYN NEW YORK

Drawing Title
SSDS LAYOUT

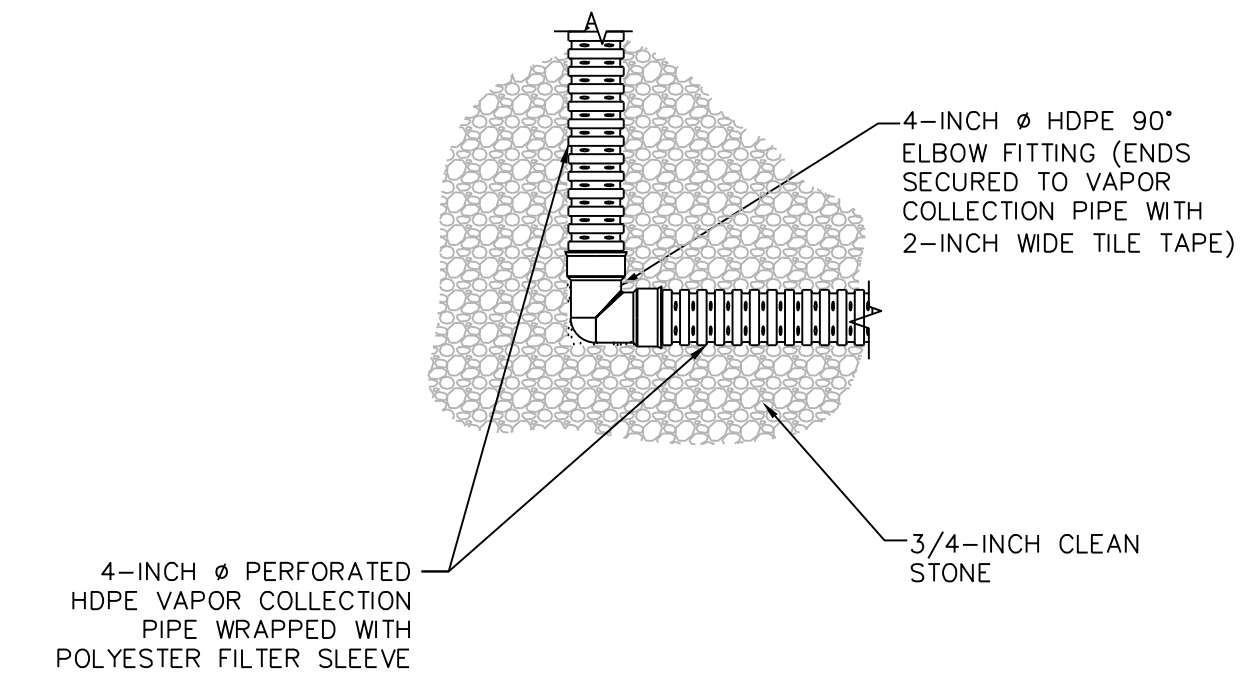
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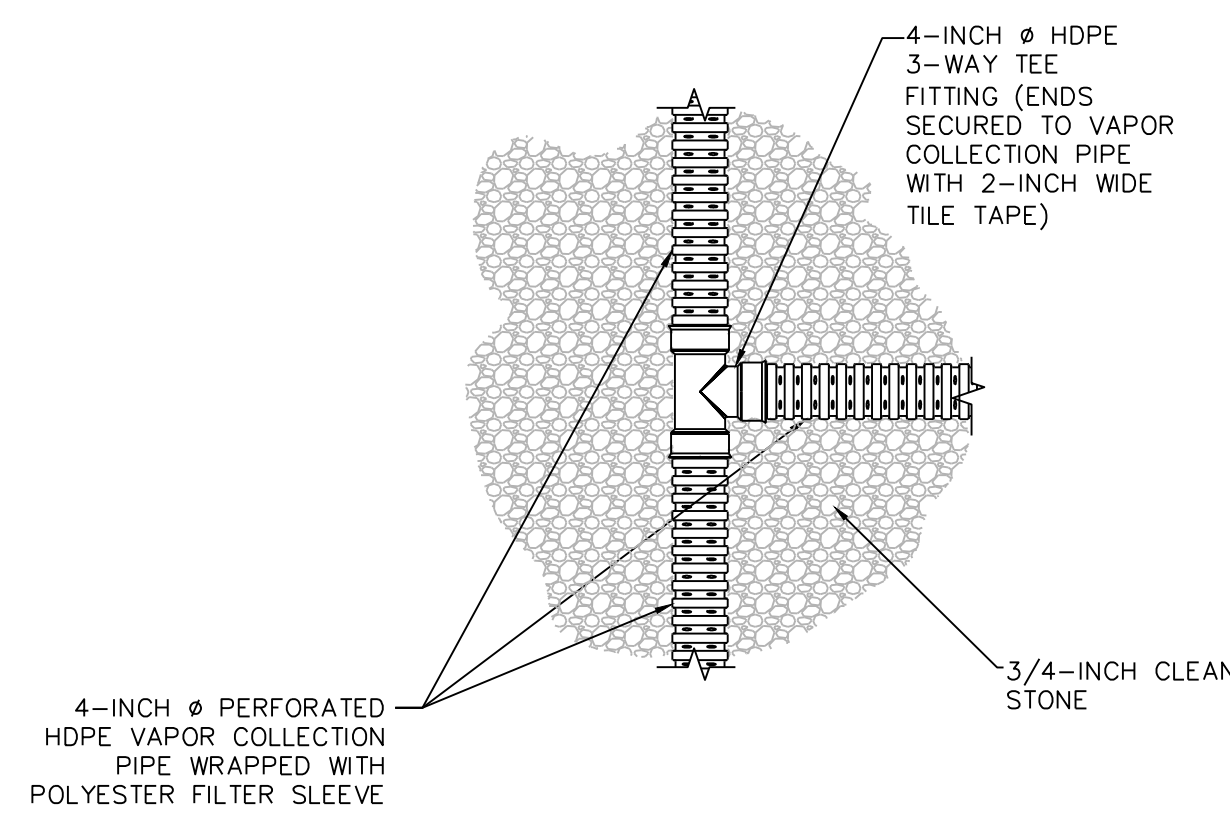
DETAIL 1: TYPICAL SECTION FOR VAPOR COLLECTION PIPE AND VAPOR BARRIER
NOT TO SCALE



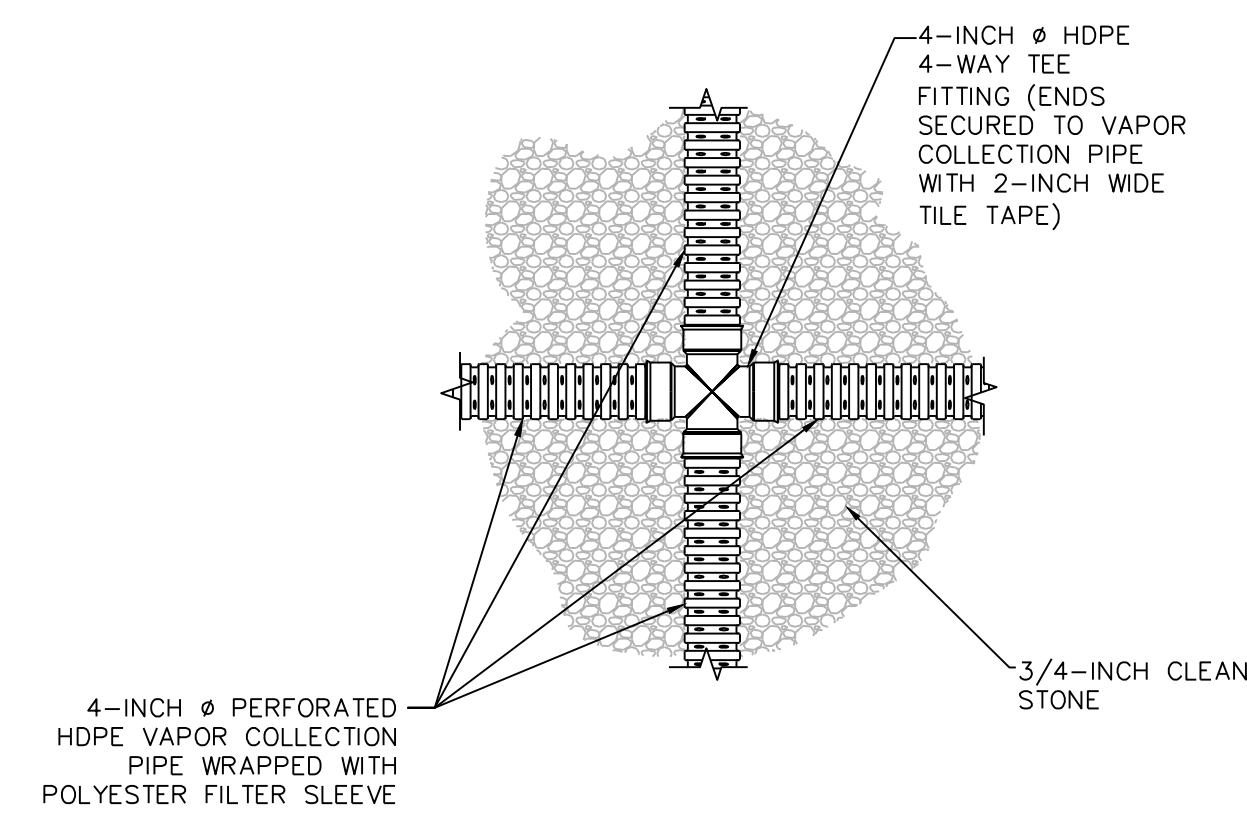
DETAIL 2: TYPICAL COUPLER CONNECTION FOR VAPOR COLLECTION PIPE
(PLAN VIEW)
NOT TO SCALE



DETAIL 3: TYPICAL 90° ELBOW FITTING CONNECTION FOR VAPOR COLLECTION PIPE
(PLAN VIEW)
NOT TO SCALE



DETAIL 4: TYPICAL 3-WAY TEE FITTING CONNECTION FOR VAPOR COLLECTION PIPE
(PLAN VIEW)
NOT TO SCALE



DETAIL 5: TYPICAL 4-WAY TEE FITTING CONNECTION FOR VAPOR COLLECTION PIPE
(PLAN VIEW)
NOT TO SCALE

GENERAL NOTES:

- DESIGN DETAILS AND DRAWING ARE ADAPTED FROM EPA DOCUMENT EPA/625/R-92/016.
- INSTALLATION OF THE SUB-SLAB COMPONENTS AND RISER PIPE MUST BE COORDINATED WITH THE INSTALLATION OF OTHER UTILITIES AND STRUCTURAL COMPONENTS.
- VAPOR COLLECTION PIPE SHALL BE 4-INCH Ø FLEXIBLE, CORRUGATED, PERFORATED, HIGH DENSITY POLYETHYLENE (HDPE) PIPE WITH A MINIMUM PIPE STIFFNESS OF 35 POUNDS PER SQUARE INCH (PSI) AT 5% DEFLECTION. PERFORATIONS SHALL BE SLOT-TYPE. THERE SHALL BE, AT A MINIMUM, THREE EQUALLY SPACED PERFORATIONS PER GROOVE (I.E. DEPRESSED SECTION OF THE PIPE) OF THE CORRUGATED PIPE. PERFORATIONS ON ALTERNATING GROOVES SHALL BE OFF-SET.
- TOP OF PERFORATED VAPOR COLLECTION PIPE SHALL BE 1 INCH FROM THE BOTTOM OF SLAB. WHEN NECESSARY, PERFORATED VAPOR COLLECTION PIPE MAY BE ROUTED UNDERNEATH OTHER UTILITIES AND PIPING IN THE SUBSURFACE; TOP OF PERFORATED VAPOR COLLECTION PIPE SHOULD NOT EXCEED 12 INCHES FROM THE BOTTOM OF THE SLAB.
- ALL FITTINGS AND CONNECTIONS FOR THE VAPOR COLLECTION PIPE SHALL BE 4-INCH Ø HDPE FITTINGS, MADE BY THE SAME MANUFACTURER AS THE 4-INCH Ø PIPE, AND OF THE TYPE RECOMMENDED BY THE MANUFACTURER FOR USE WITH THE 4-INCH Ø PIPE. SECURE ALL FITTINGS AND CONNECTIONS WITH 2-INCH WIDE TILE TAPE.
- POLYESTER FILTER SLEEVES SHALL HAVE A MINIMUM AIR PERMEABILITY OF 70 CUBIC FEET/SQUARE FEET/MINUTE.
- REFER TO FOUNDATION DRAWINGS FOR PIPE SLEEVE AT GRADE BEAM DETAIL.
- RISER PIPE (DESIGNED BY OTHERS) SHALL BE 4-INCH Ø METAL PIPE OR OTHER MATERIAL THAT COMPLIES WITH APPLICABLE BUILDING CODE.
- RISER PIPE (DESIGNED BY OTHERS) SHALL BE EXTENDED TO THE ROOF WITH MINIMAL CHANGES IN DIRECTION AS SHOWN ON THE MECHANICAL AND PLUMBING DRAWINGS.
- ALL PIPE AND CONDUIT PENETRATIONS THROUGH THE SLAB (INCLUDING MECHANICAL, ELECTRICAL, PLUMBING, OR OTHER) SHALL BE SEALED WITH A HIGH ADHESIVE SEALANT, UNLESS OTHERWISE SPECIFIED. PENETRATIONS SHALL BE AIR-TIGHT.
- RISER PIPE MUST BE CLEARLY LABELED "CAUTION: DO NOT ALTER SUB-SLAB VAPOR VENT PIPE" IN EACH ACCESSIBLE AREA (A MINIMUM OF EVERY 10 LINEAR FEET OF RISER PIPE RUN).

- SYSTEM INSTALLATION SHALL ADHERE TO: FINAL GUIDANCE FOR EVALUATING SOIL VAPOR INTRUSION IN THE STATE OF NEW YORK PREPARED BY NEW YORK STATE DEPARTMENT OF HEALTH (NYSDOH), DATED OCTOBER 2006 AND 2008 NEW YORK CITY MECHANICAL CODE, CHAPTER 5, SECTION MC 512-SUBSLAB EXHAUST SYSTEMS. POINT OF EXHAUST (DESIGNED BY OTHERS) SHALL BE
 - ABOVE THE EAVE OF THE ROOF (PREFERABLY, ABOVE THE HIGHEST EAVE OF THE BUILDING AND AT LEAST 12-INCHES ABOVE THE SURFACE OF THE ROOF);
 - AT LEAST 10 FEET ABOVE GROUND LEVEL,
 - AT LEAST 10 FEET AWAY FROM ANY OPENING THAT IS LESS THAN 2 FEET BELOW THE EXHAUST POINT, AND
 - 10 FEET FROM ANY ADJOINING OR ADJACENT BUILDINGS, OR HVAC INTAKES OR SUPPLY REGISTERS.
- ALL EXTERNAL PIPES SHALL BE PAINTED WITH A CORROSION RESISTANT COATING, DEPENDING ON PIPE MATERIAL.
- 3/4-INCH CLEAN STONE = IN-PLACE STONE SHALL BE CLEAN, COARSE, NATURAL, ANGULAR, WASHED 3/4-INCH AGGREGATE.
- CLEAN STONE LAYER ON TOP OF PIPE SHALL NOT BE COMPACTED.

WATERPROOFING/VAPOR BARRIER NOTES:

- THE WATERPROOFING/VAPOR BARRIER SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE MANUFACTURER GUIDELINES AND DETAILS.
- THE WATERPROOFING/VAPOR BARRIER SHALL BE INSTALLED BY A MANUFACTURER-CERTIFIED INSTALLER.
- VAPOR BARRIER SHALL BE INSPECTED IMMEDIATELY BEFORE CONCRETE IS PLACED. ALL PENETRATIONS, HOLES, OR TEARS SHALL BE SEALED BEFORE CONCRETE IS PLACED.

Warning: It is a violation of the NYS Education Law Article 145 for any person, unless he is acting under the direction of a licensed Professional Engineer, to alter this item in any way.

Date	Description	No.
Revisions		

NAME	DATE
PROFESSIONAL Joel B. Landes N.Y. LIC. No. 076348	

LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES

21 Penn Plaza
360 West 31st Street, 8th Floor
New York, NY 10001-2727
P: 212.479.5400 F: 212.479.5444
www.langan.com

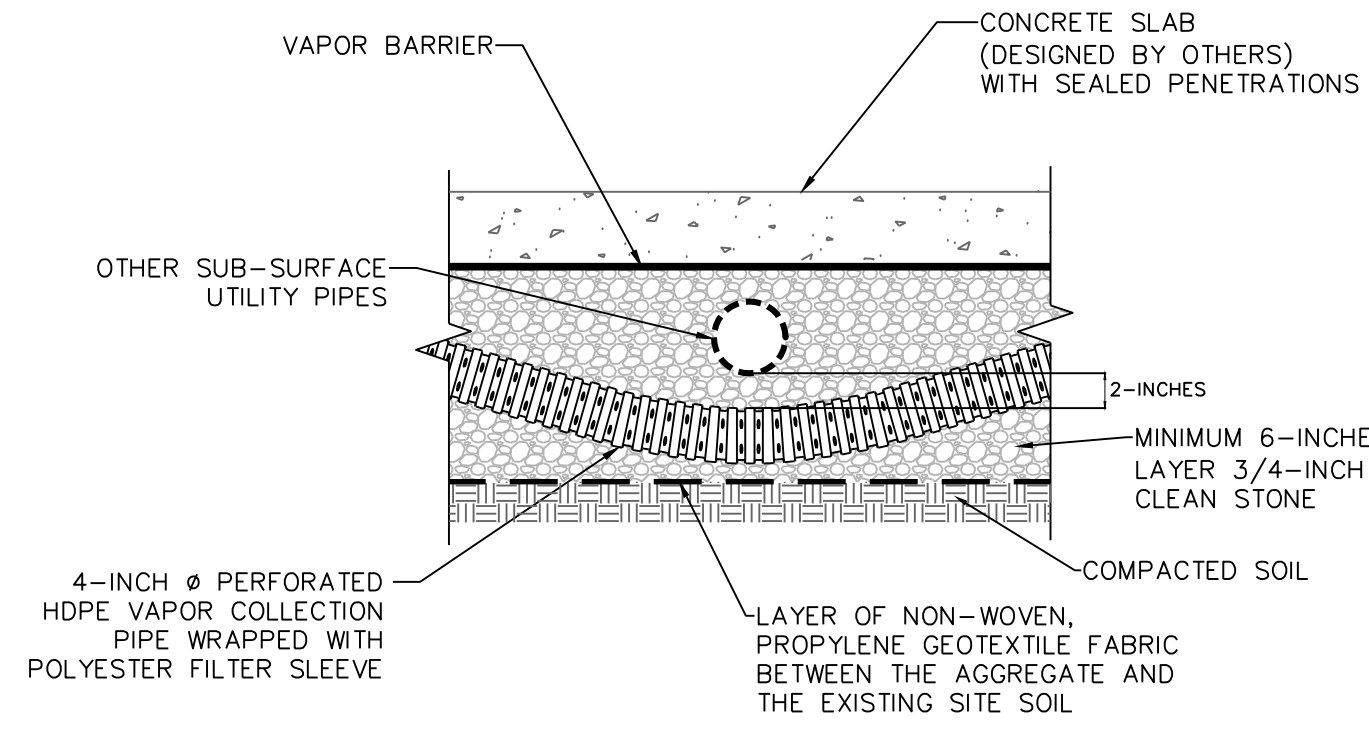
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	BROOKLYN NEW YORK

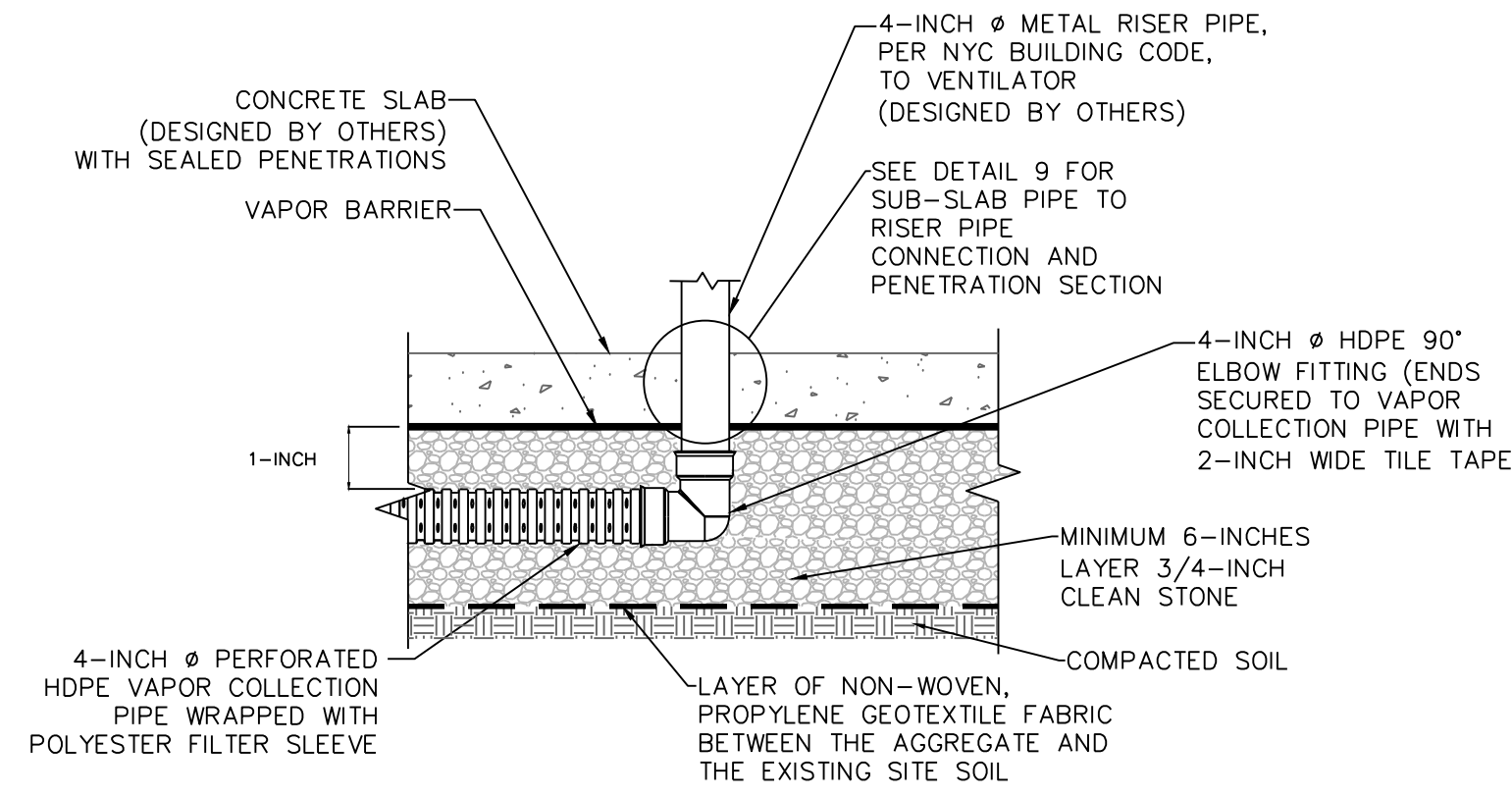
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Last Revised	08/16/2011	Of	

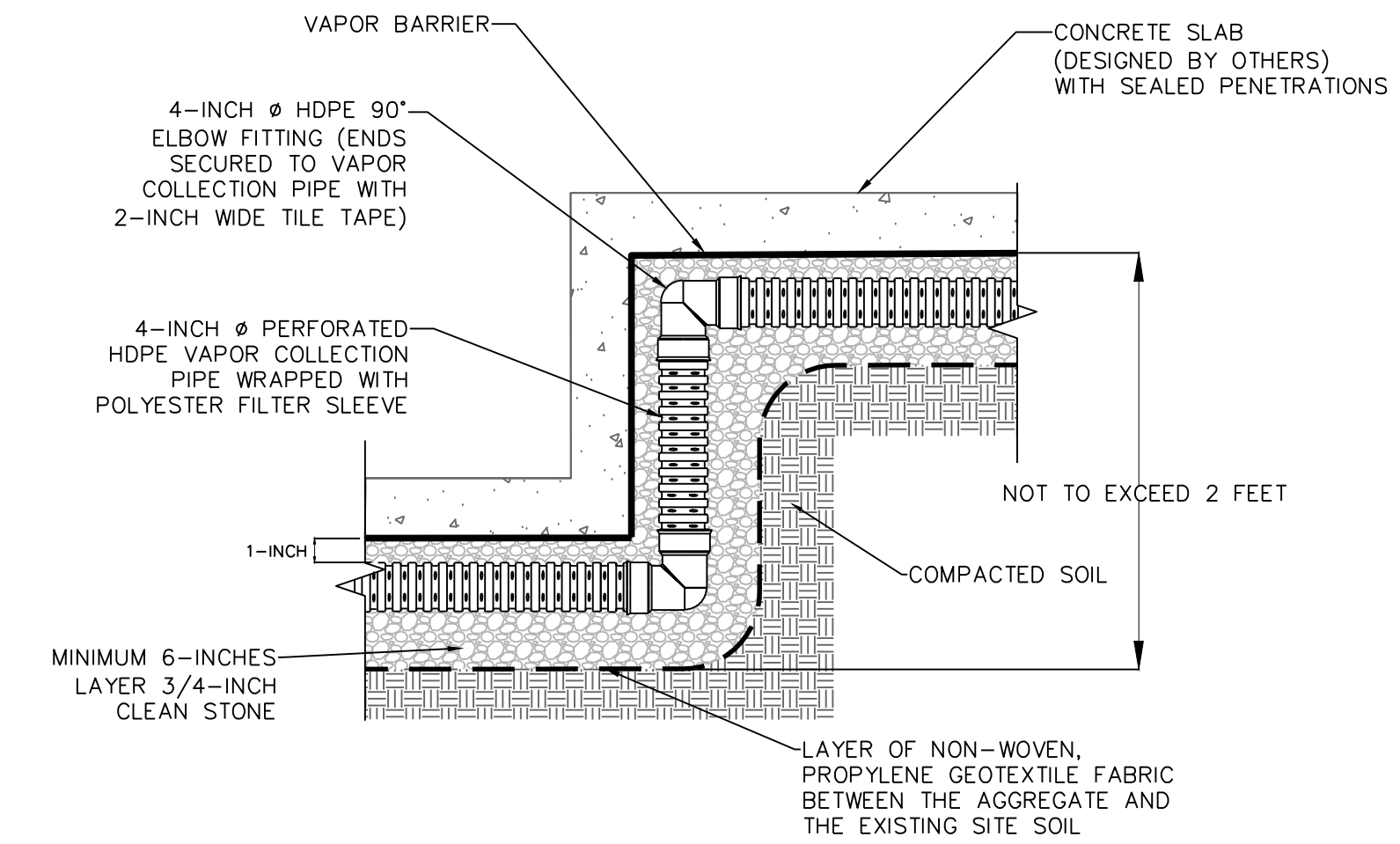
NOTE: DETAIL 6 ONLY APPLIES WHERE 4-INCH HDPE VAPOR COLLECTION PIPE DOES NOT FIT ABOVE UTILITY PIPE.



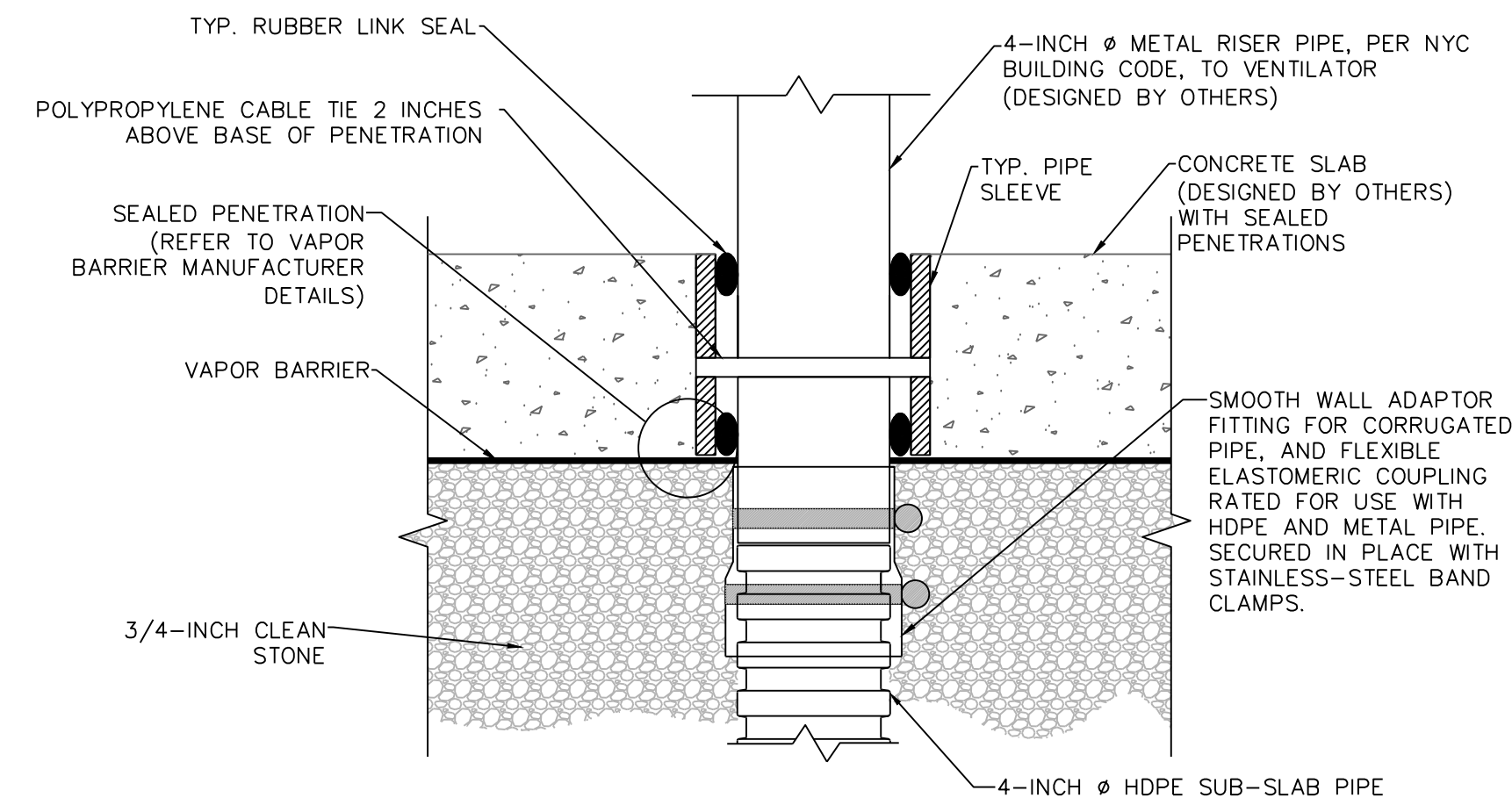
DETAIL 6: TYPICAL DETAIL AT LOCATIONS OTHER SUB-SLAB UTILITY PIPE OVERLIES PERFORATED SUB-SLAB PIPE
NOT TO SCALE



DETAIL 7: TYPICAL SECTION AT PERFORATED PIPE TO RISER PIPE
NOT TO SCALE



DETAIL 8: TYPICAL SECTION FOR PERFORATED SUB-SLAB PIPE AT ELEVATION CHANGE BETWEEN TWO SLABS
NOT TO SCALE



DETAIL 9: VAPOR COLLECTION PIPE TO RISER PIPE CONNECTION
NOT TO SCALE

GENERAL NOTES:

- DESIGN DETAILS AND DRAWING ARE ADAPTED FROM EPA DOCUMENT EPA/625/R-92/016.
- INSTALLATION OF THE SUB-SLAB COMPONENTS AND RISER PIPE MUST BE COORDINATED WITH THE INSTALLATION OF OTHER UTILITIES AND STRUCTURAL COMPONENTS.
- VAPOR COLLECTION PIPE SHALL BE 4-INCH Ø FLEXIBLE, CORRUGATED, PERFORATED, HIGH DENSITY POLYETHYLENE (HDPE) PIPE WITH A MINIMUM PIPE STIFFNESS OF 35 POUNDS PER SQUARE INCH (PSI) AT 5% DEFLECTION. PERFORATIONS SHALL BE SLOT-TYPE. THERE SHALL BE, AT A MINIMUM, THREE EQUALLY SPACED PERFORATIONS PER GROOVE (I.E. DEPRESSED SECTION OF THE PIPE) OF THE CORRUGATED PIPE. PERFORATIONS ON ALTERNATING GROOVES SHALL BE OFF-SET.
- TOP OF PERFORATED VAPOR COLLECTION PIPE SHALL BE 1 INCH FROM THE BOTTOM OF SLAB. WHEN NECESSARY, PERFORATED VAPOR COLLECTION PIPE MAY BE ROUTED UNDERNEATH OTHER UTILITIES AND PIPING IN THE SUBSURFACE; TOP OF PERFORATED VAPOR COLLECTION PIPE SHOULD NOT EXCEED 12 INCHES FROM THE BOTTOM OF THE SLAB.
- ALL FITTINGS AND CONNECTIONS FOR THE VAPOR COLLECTION PIPE SHALL BE 4-INCH Ø HDPE FITTINGS, MADE BY THE SAME MANUFACTURER AS THE 4-INCH Ø PIPE, AND OF THE TYPE RECOMMENDED BY THE MANUFACTURER FOR USE WITH THE 4-INCH Ø PIPE. SECURE ALL FITTINGS AND CONNECTIONS WITH 2-INCH WIDE TILE TAPE.
- POLYESTER FILTER SLEEVES SHALL HAVE A MINIMUM AIR PERMEABILITY OF 70 CUBIC FEET/SQUARE FOOT/MINUTE.
- REFER TO FOUNDATION DRAWINGS FOR PIPE SLEEVE AT GRADE BEAM DETAIL.
- RISER PIPE (DESIGNED BY OTHERS) SHALL BE 4-INCH Ø METAL PIPE OR OTHER MATERIAL THAT COMPLIES WITH APPLICABLE BUILDING CODE.
- RISER PIPE (DESIGNED BY OTHERS) SHALL BE EXTENDED TO THE ROOF WITH MINIMAL CHANGES IN DIRECTION AS SHOWN ON THE MECHANICAL AND PLUMBING DRAWINGS.
- ALL PIPE AND CONDUIT PENETRATIONS THROUGH THE SLAB (INCLUDING MECHANICAL, ELECTRICAL, PLUMBING, OR OTHER) SHALL BE SEALED WITH A HIGH ADHESIVE SEALANT, UNLESS OTHERWISE SPECIFIED. PENETRATIONS SHALL BE AIR-TIGHT.
- RISER PIPE MUST BE CLEARLY LABELED "CAUTION: DO NOT ALTER SUB-SLAB VAPOR VENT PIPE" IN EACH ACCESSIBLE AREA (A MINIMUM OF EVERY 10 LINEAR FEET OF RISER PIPE RUN).
- SYSTEM INSTALLATION SHALL ADHERE TO: FINAL GUIDANCE FOR EVALUATING SOIL VAPOR INTRUSION IN THE STATE OF NEW YORK PREPARED BY NEW YORK STATE DEPARTMENT OF HEALTH (NYSDOH), DATED OCTOBER 2006 AND 2008 NEW YORK CITY MECHANICAL CODE, CHAPTER 5, SECTION MC 512-SUBSLAB EXHAUST SYSTEMS. POINT OF EXHAUST (DESIGNED BY OTHERS) SHALL BE
 - ABOVE THE EAVE OF THE ROOF (PREFERABLY, ABOVE THE HIGHEST EAVE OF THE BUILDING AND AT LEAST 12-INCHES ABOVE THE SURFACE OF THE ROOF);
 - AT LEAST 10 FEET ABOVE GROUND LEVEL;
 - AT LEAST 10 FEET AWAY FROM ANY OPENING THAT IS LESS THAN 2 FEET BELOW THE EXHAUST POINT, AND
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WATERPROOFING/VAPOR BARRIER NOTES:

- THE WATERPROOFING/VAPOR BARRIER SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE MANUFACTURER GUIDELINES AND DETAILS.
- THE WATERPROOFING/VAPOR BARRIER SHALL BE INSTALLED BY A MANUFACTURER-CERTIFIED INSTALLER.
- VAPOR BARRIER SHALL BE INSPECTED IMMEDIATELY BEFORE CONCRETE IS PLACED. ALL PENETRATIONS, HOLES, OR TEARS SHALL BE SEALED BEFORE CONCRETE IS PLACED.

Warning: It is a violation of the NYS Education Law Article 145 for any person, unless he is acting under the direction of a licensed Professional Engineer, to alter this item in any way.

Date	Description	No.	NAME	DATE
	Revisions		PROFESSIONAL Joel B. Landes N.Y. LIC. No. 076348	

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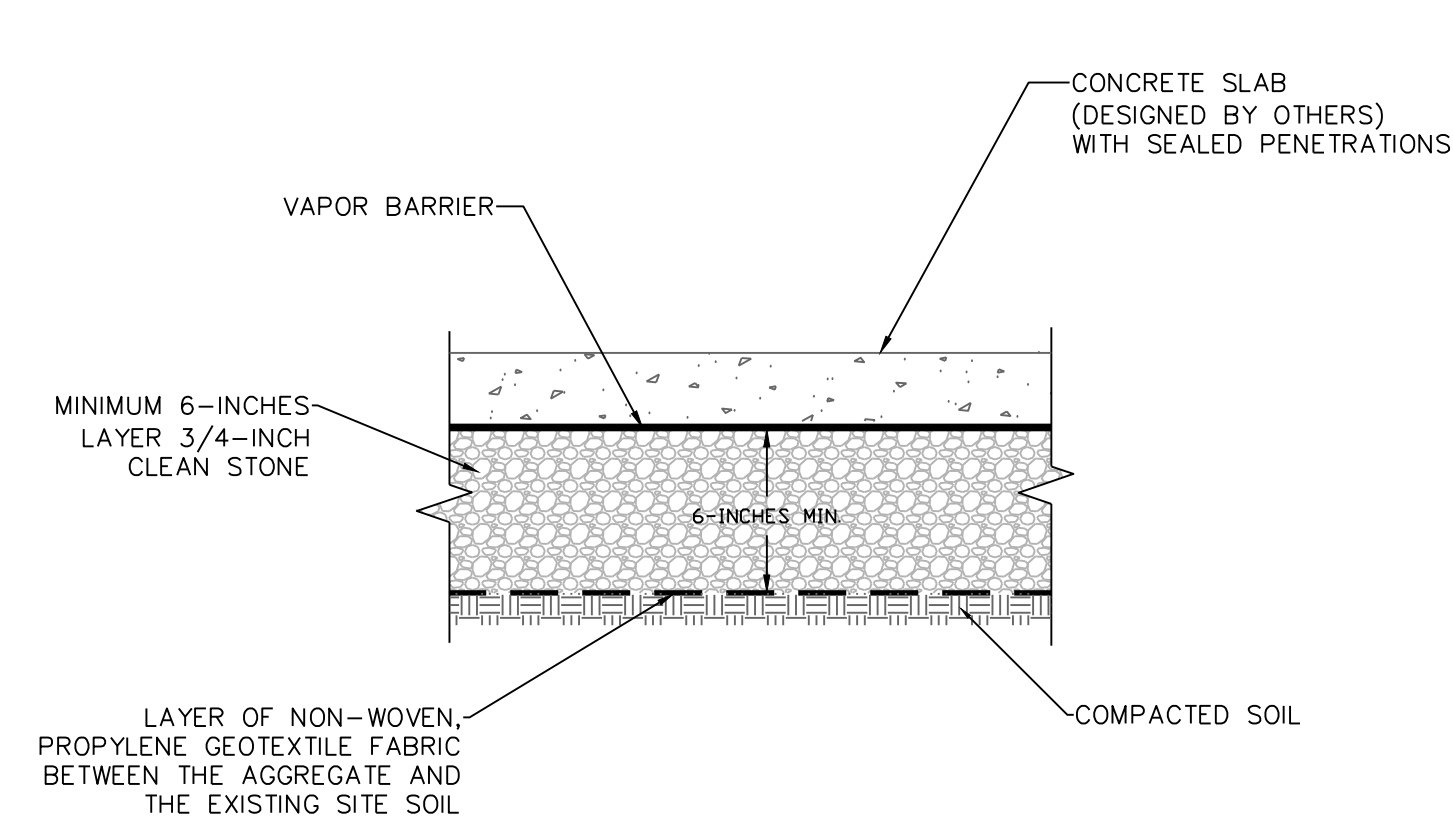
21 Penn Plaza
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New York, NY 10001-2727
P: 212.479.5400 F: 212.479.5444
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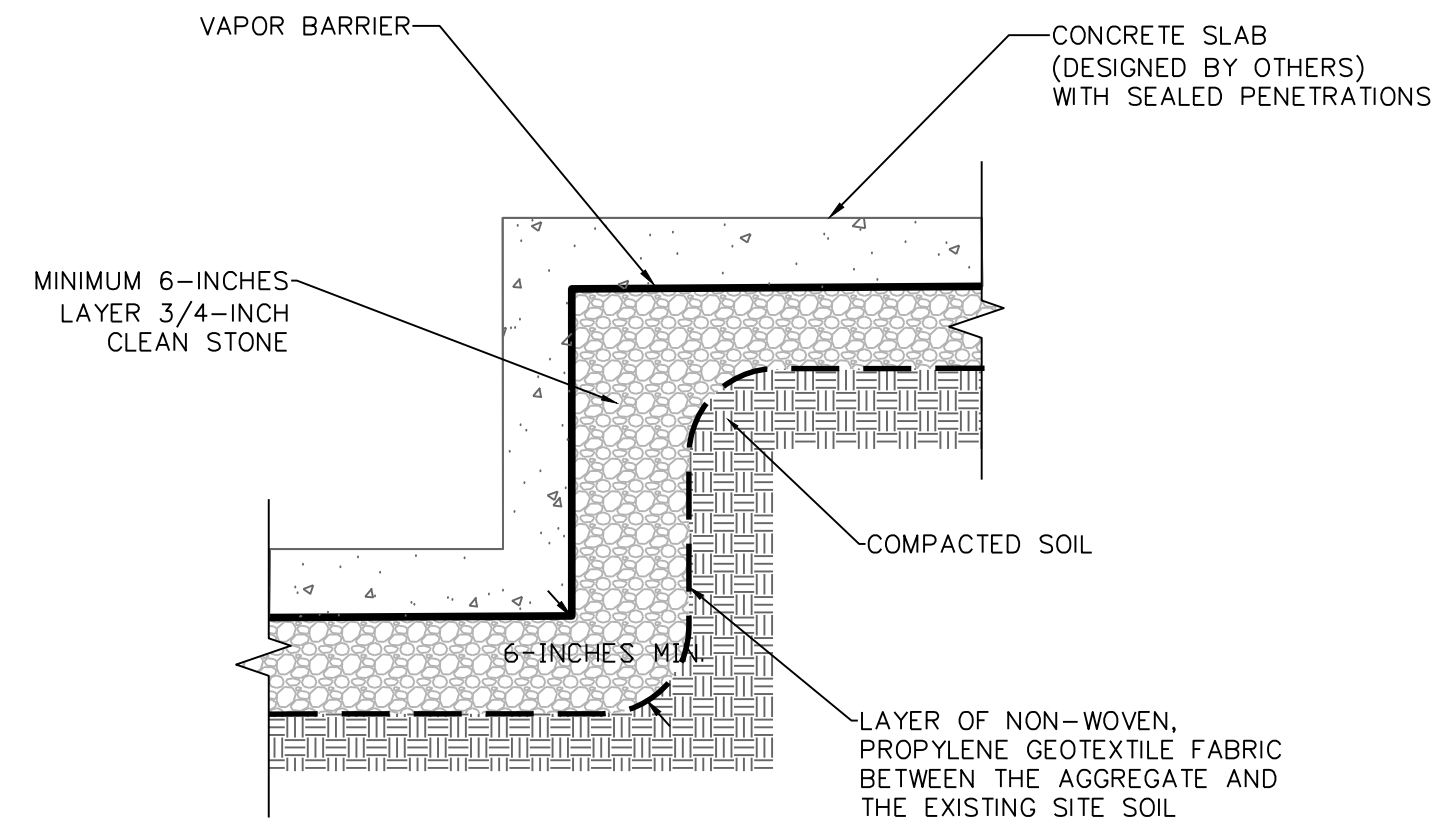
Project
177 HARRISON AVE.
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Drawing Title
SSDS DETAILS

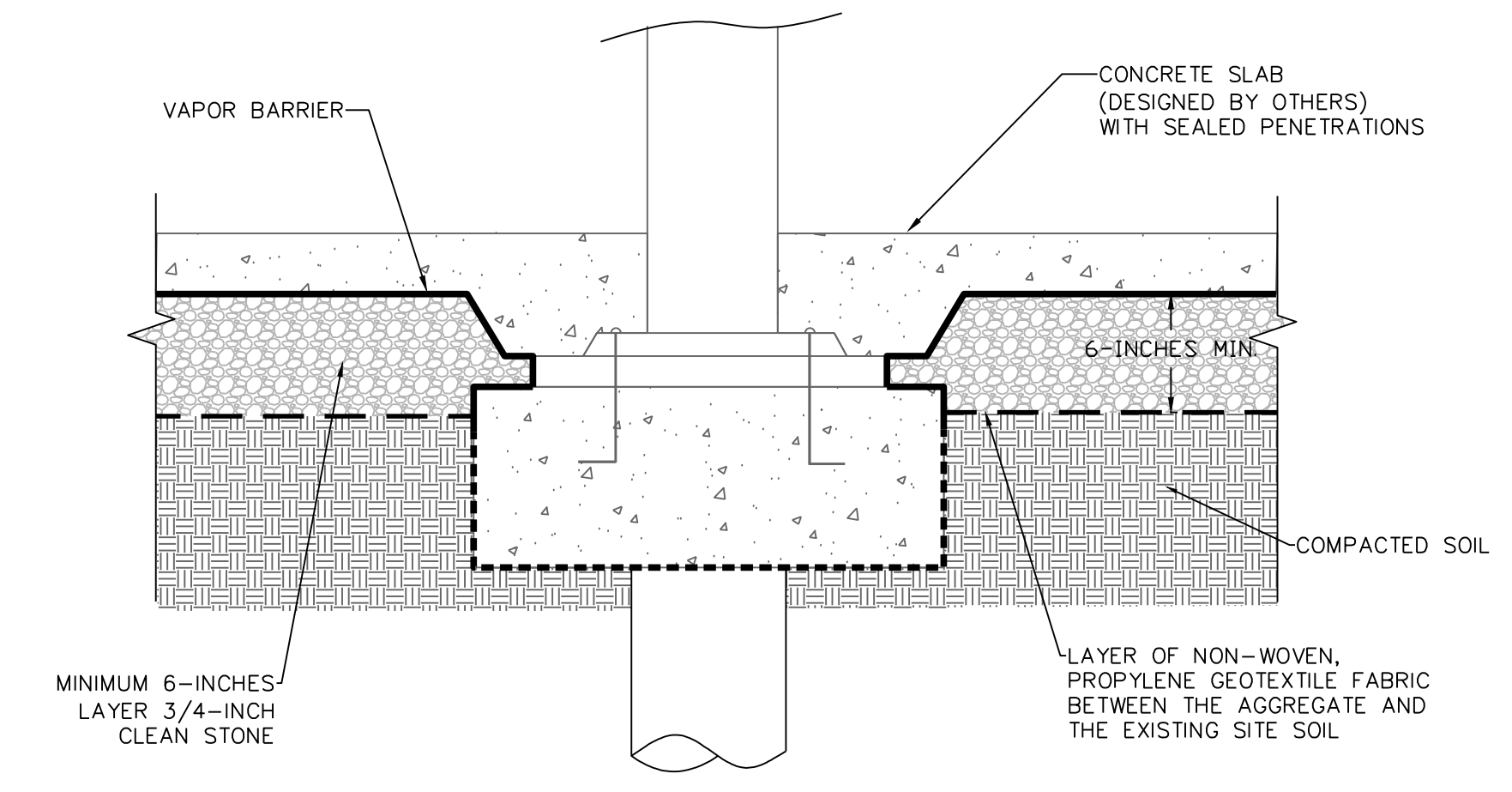
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Date	08/09/2011		
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Last Revised	08/16/2011	Of	



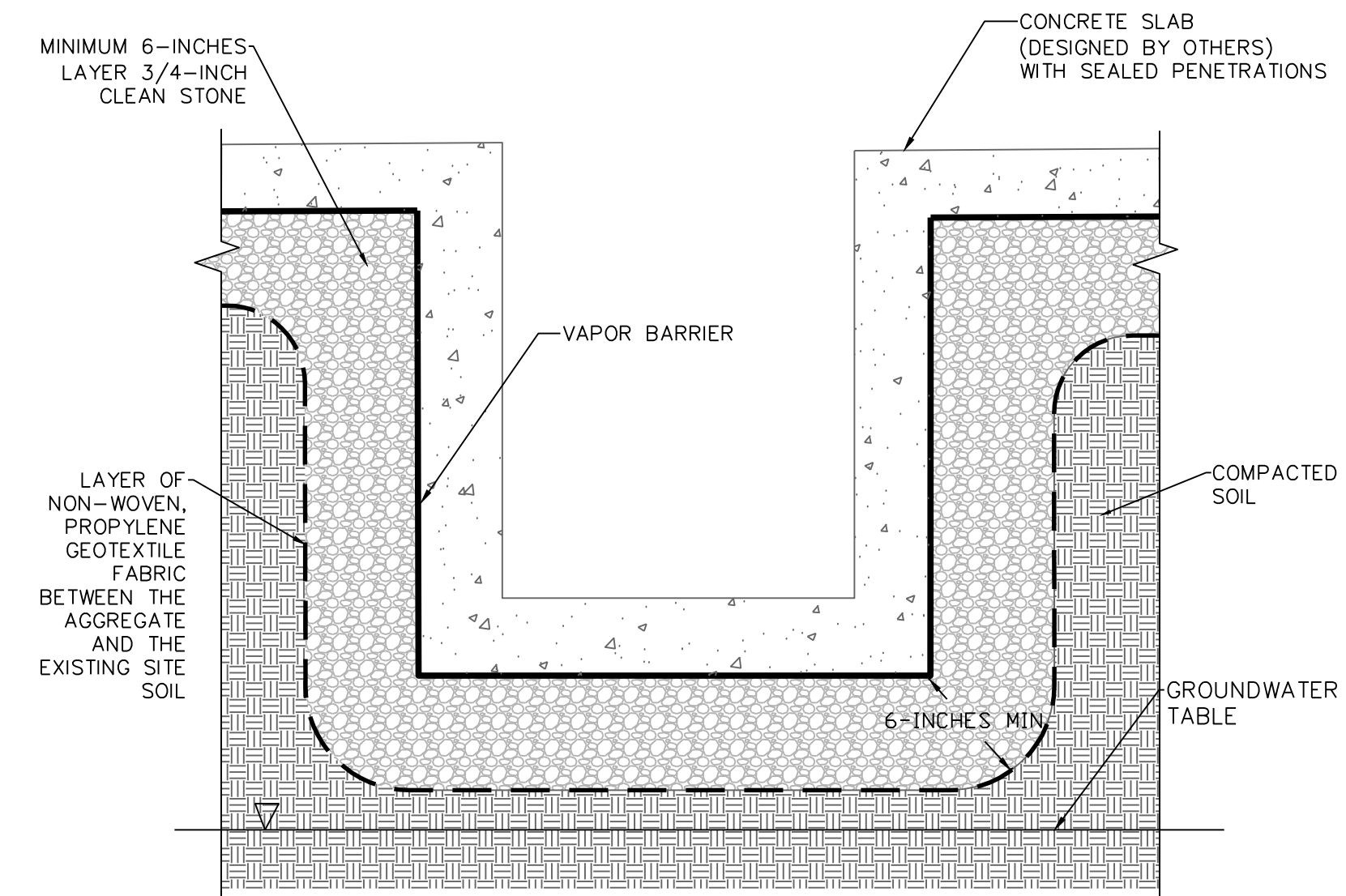
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NOT TO SCALE



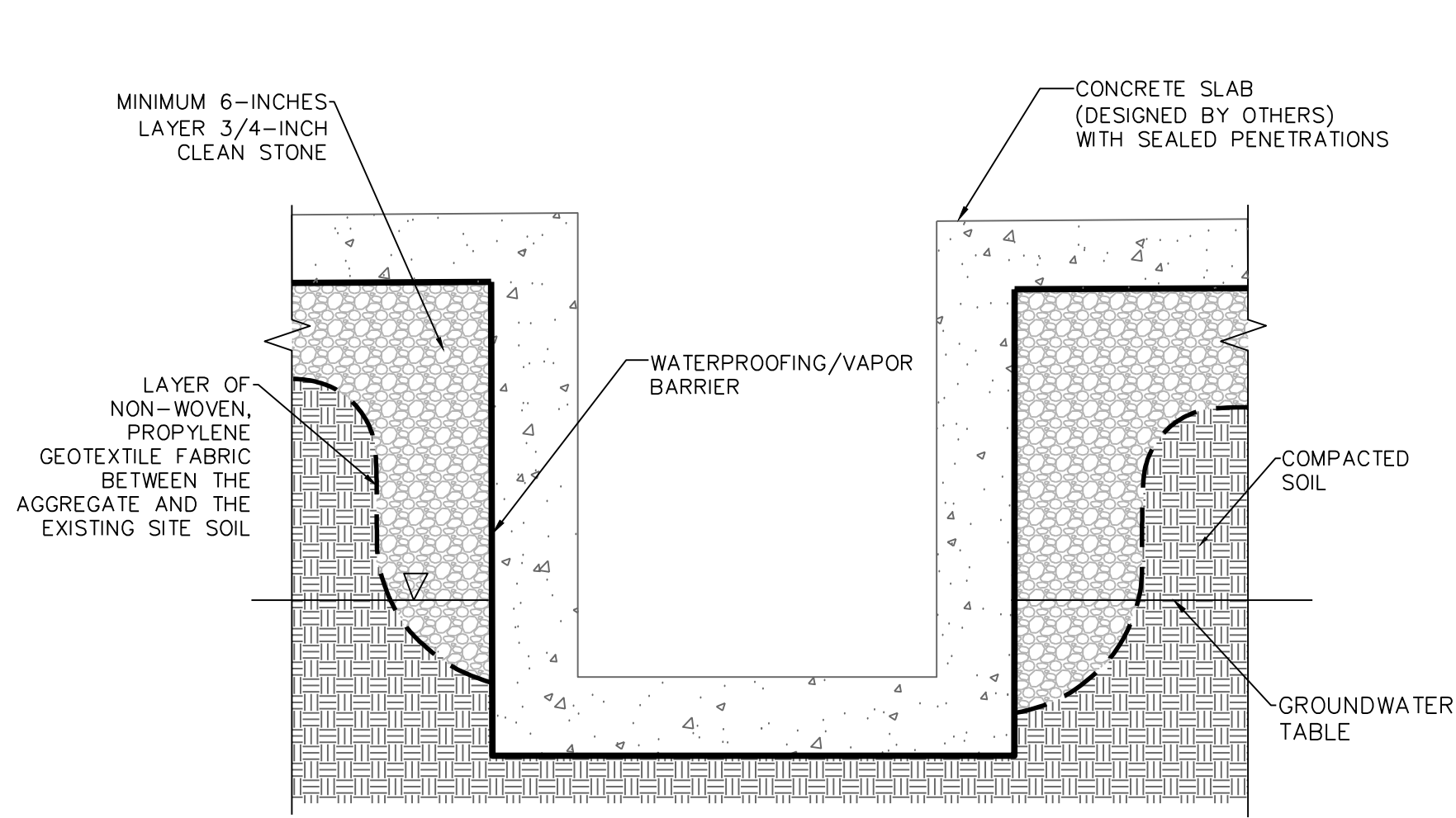
DETAIL 11: TYPICAL SECTION FOR ELEVATION CHANGE BETWEEN TWO SLABS
NOT TO SCALE



DETAIL 12: TYPICAL DETAIL FOR INTERIOR PILE CAP
NOT TO SCALE



DETAIL 13: TYPICAL UTILITY PIT SECTION (ABOVE GROUNDWATER)
NOT TO SCALE



DETAIL 14: TYPICAL ELEVATOR PIT SECTION (BELOW GROUNDWATER)
NOT TO SCALE

GENERAL NOTES:

- DESIGN DETAILS AND DRAWING ARE ADAPTED FROM EPA DOCUMENT EPA/625/R-92/016.
- INSTALLATION OF THE SUB-SLAB COMPONENTS AND RISER PIPE MUST BE COORDINATED WITH THE INSTALLATION OF OTHER UTILITIES AND STRUCTURAL COMPONENTS.
- VAPOR COLLECTION PIPE SHALL BE 4-INCH Ø FLEXIBLE, CORRUGATED, PERFORATED, HIGH DENSITY POLYETHYLENE (HDPE) PIPE WITH A MINIMUM PIPE STIFFNESS OF 35 POUNDS PER SQUARE INCH (PSI) AT 5% DEFLECTION. PERFORATIONS SHALL BE SLOT-TYPE. THERE SHALL BE, AT A MINIMUM, THREE EQUALLY SPACED PERFORATIONS PER GROOVE (I.E. DEPRESSED SECTION OF THE PIPE) OF THE CORRUGATED PIPE. PERFORATIONS ON ALTERNATING GROOVES SHALL BE OFF-SET.
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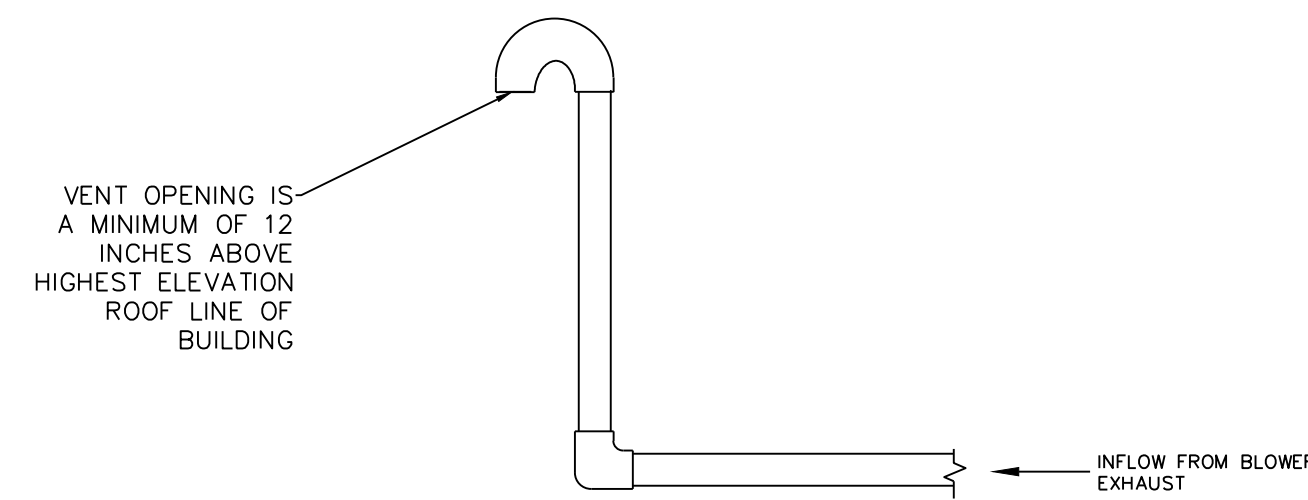
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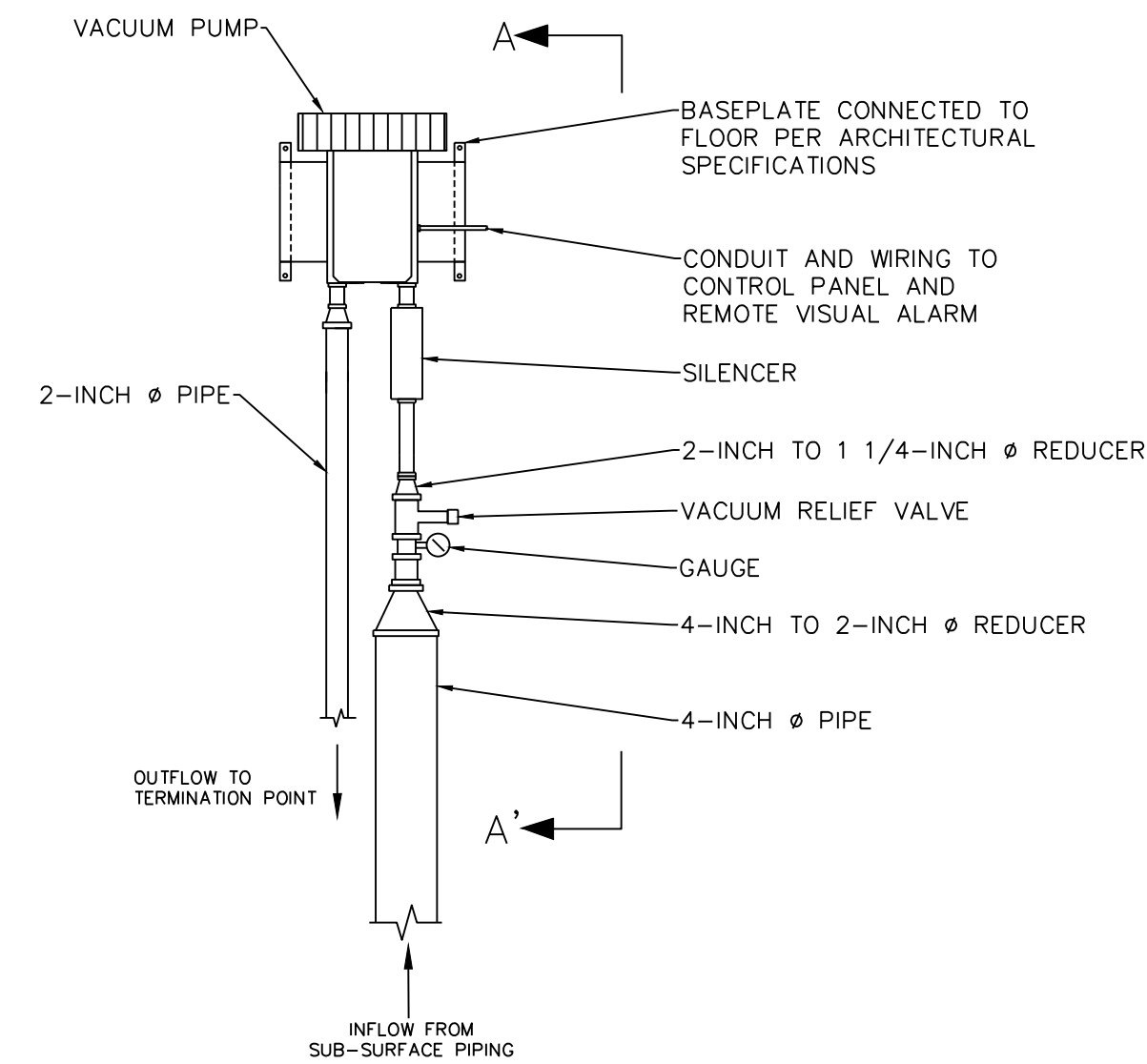
Project	177 HARRISON AVE.
	NEW YORK

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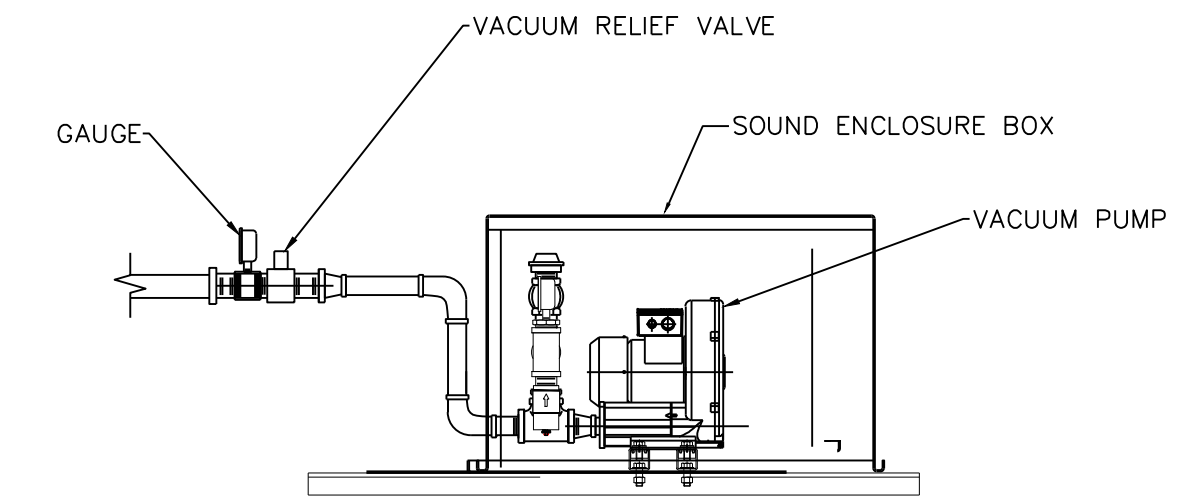
Project No.	170091701	Drawing No.	SSD-4
Date	08/09/2011		
Scale	AS SHOWN		
Drn. By	VMT		
Last Revised	08/16/2011	Of	



DETAIL 15: VENT TERMINATION POINT
SECTION VIEW
NOT TO SCALE



DETAIL 16: VACUUM BLOWER PLAN VIEW
NOT TO SCALE



DETAIL 17: VACUUM BLOWER
SECTION VIEW (A-A')
NOT TO SCALE

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BLOWER NOTES:

- THE COMPLETE BLOWER ASSEMBLY INCLUDING BLOWER, MOTOR, BASEPLATE, CONTROL PANEL, REMOTE VISUAL ALARM, VALVES, GAUGES, FILTER, AND FLEXIBLE HOSE SHALL BE PROVIDED BY THE MANUFACTURER.
- BLOWER ASSEMBLY TO BE INSTALLED SHALL PROVIDE, AT CONTINUOUS OPERATION, A MINIMUM OF 190 CUBIC FEET PER MINUTE (CFM) FLOW RATE AT 25 INCHES OF WATER COLUMN (INCHES WC) VACUUM AT BLOWER. BLOWER SHALL BE ABLE TO REMAIN IN CONTINUOUS OPERATION AT A VACUUM OF 100 INCHES WC.
- THE BLOWER SCHEMATICS ARE SHOWN TO ILLUSTRATE THE REQUIRED COMPONENTS AND THE GENERAL LOCATIONS IN THE PIPE RUN AND SHALL NOT BE CONSIDERED TO BE ACCURATE. THE ACTUAL CONFIGURATION AND DIMENSIONS OF THE BLOWER ASSEMBLY WILL VARY BASED ON MANUFACTURING METHODS AND FIELD CONDITIONS. FINAL DESIGN AND BLOWER SYSTEM SELECTED ARE SUBJECT TO APPROVAL BY THE ENGINEER. PROVIDE ALL BLOWER SPECIFICATIONS AND CUT SHEETS FOR COMMISSION AND/OR CONSTRUCTION MANAGER'S APPROVAL PRIOR TO INSTALLATION.
- THE BLOWERS SHALL BE HOUSED IN A SD-4 METAL SOUND ENCLOSURE RATED AS EXPLOSION PROOF. THE BLOWERS SHALL BE INSTALLED WITHIN THE ENCLOSURE BY THE BLOWER MANUFACTURER.
- THE ELECTRICAL PANEL FOR EACH BLOWER SHALL INCLUDE AN AUXILIARY CONTACT FOR THE REMOTE ALARM AND WILL BE MOUNTED ON THE EXTERIOR OF THE ENCLOSURE. THE ELECTRICAL PANEL SHALL BE HOUSED IN NEMA 7 ENCLOSURE. THE REMOTE ALARM SHALL BE LOCATED WITHIN A BUILDING MANAGERS OFFICE. THE ALARM SHALL CONSIST OF A WARNING LIGHT, NEMA 12 ENCLOSURE, AND ASSOCIATED RELAYS. THE REMOTE ALARM AND BLOWER CONTROL PANEL SHALL BE CONFIGURED SUCH THAT IF THE BLOWER STOPS OPERATING, THE REMOTE ALARM WILL BE ACTIVATED. A 120V ELECTRICAL SUPPLY SHALL BE PROVIDED TO THE REMOTE PANEL.
- THE REMOTE VISUAL ALARM SHALL BE LABELED AS FOLLOWS:
 - SUB-SLAB VAPOR VENTING SYSTEM ALARM
 - BLOWER MALFUNCTION IF LIT
 - SERVICE BLOWER IMMEDIATELY
- SUPPLY POWER TO EACH BLOWER ASSEMBLY, INCLUDING BLOWER, CONTROL PANEL, AND REMOTE ALARM, IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS.
- BLOWER ASSEMBLY SHALL BE LOCATED ON ROOF, AS SHOWN ON MEP DRAWINGS.
- RISER PIPE RUNS WITHIN THE BUILDINGS ARE LOCATED AS SHOWN ON MEP DRAWINGS.
- BLOWER WILL REQUIRE A THREE-PHASE, 60 HZ, 460 VOLT POWER SUPPLY.

Warning: It is a violation of the NYS Education Law Article 145 for any person, unless he is acting under the direction of a licensed Professional Engineer, to alter this item in any way.

Date	Description	No.
Revisions		

NAME PROFESSIONAL Joel B. Landes N.Y. LIC. No. 076348	DATE 07/16/2011
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Project 177 HARRISON AVE. BROOKLYN	NEW YORK
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Drawing Title SSDS DETAILS

Project No. 170091701	Drawing No.
Date 08/09/2011	SSD-5
Scale AS SHOWN	
Drn. By VMT	
Last Revised 08/16/2011	
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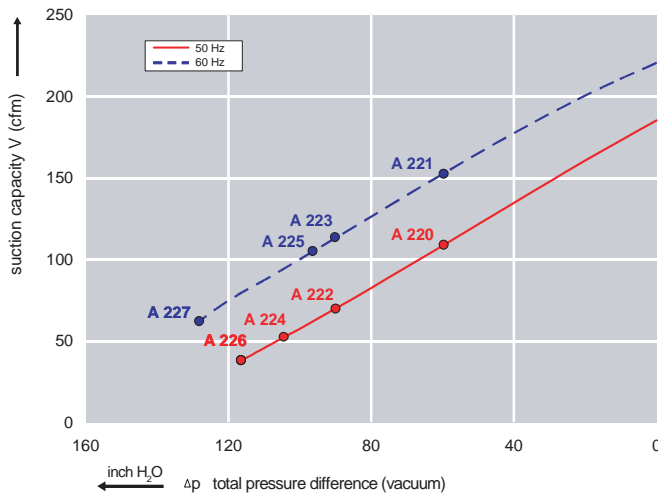
APPENDIX G
Operations and Maintenance Manual



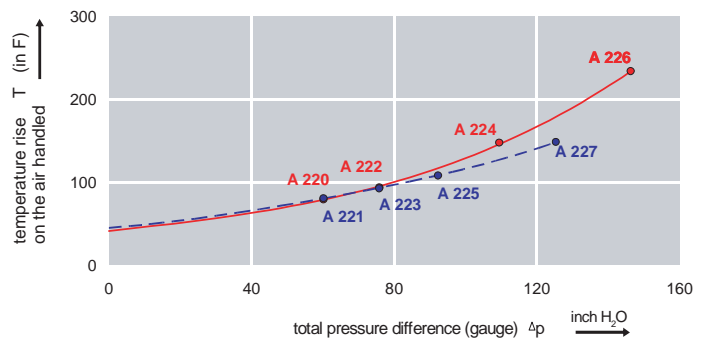
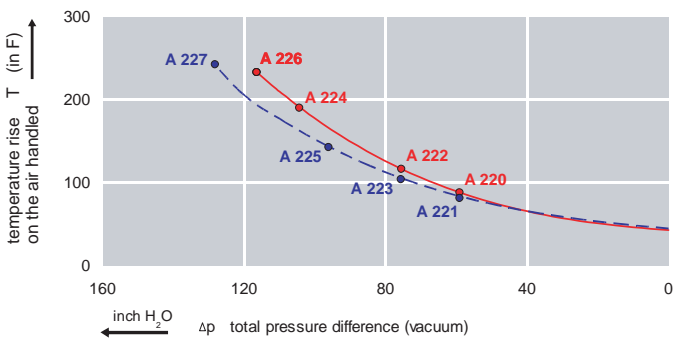
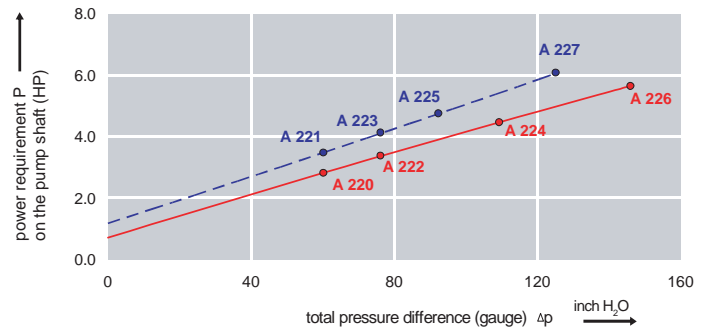
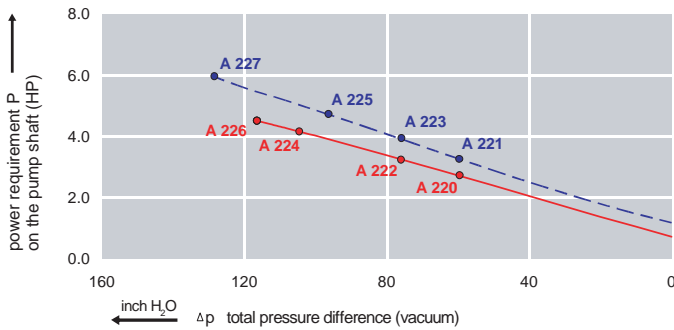
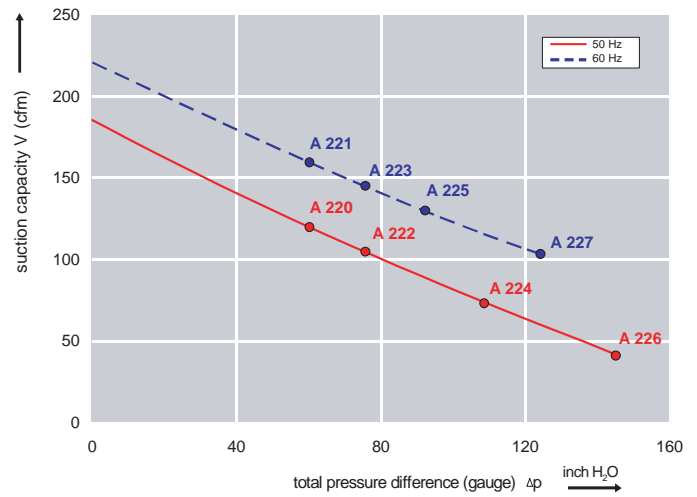
Features:

- Cooler running, outboard bearing provides maintenance-free operation
- Environmentally friendly oil-free technology
- Extremely quiet operation
- All motors are standard TEFC with Class F insulation, UL recognized, CE Compliant
Explosion-Proof motors available
- Custom construction blowers are available
- Rugged die cast aluminum construction

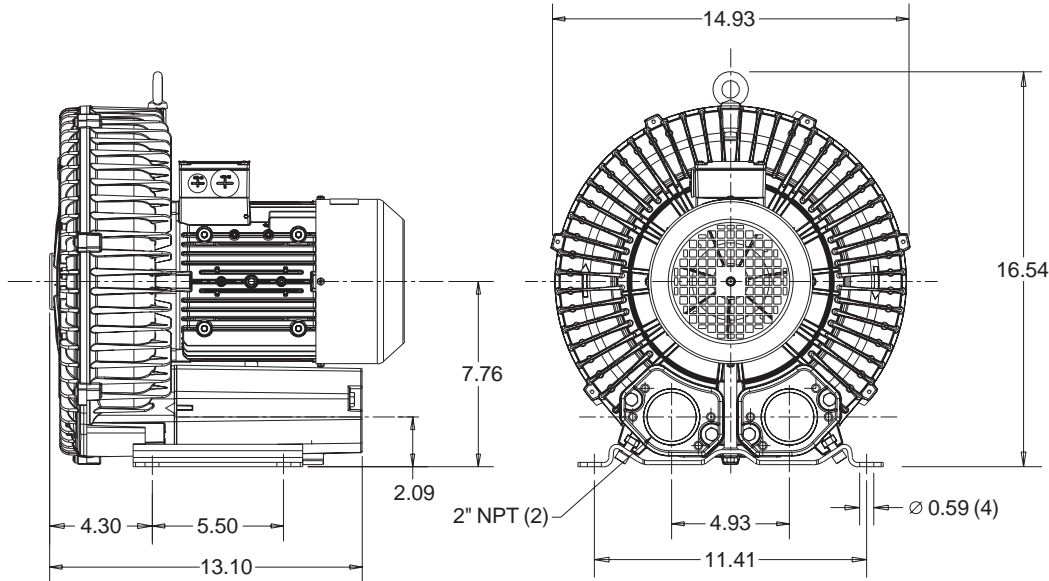
Performance curve for Vacuum pump



Performance curve for Compressor



Dimensions: (inches)



Recommended Accessories:

Relief valve:

VC61Z (Vacuum)
PC61Z (Pressure)

Filter:

ATF-200-15124/1 (Vacuum)
AF-S30-200-10 (Pressure)

Specifications subject to change without notice. Please contact factory for specification updates.

Selection & Ordering Data - Type 3BA1600

Curve No.	Order No.	Fre- quency Hz	Rated power HP	Input voltage		Input current		Permissible total differential pressure		Sound pressure level dB(A)	Weig lbs
				V		A		Vacuum inch H2O	Compressor inch H2O		
3- 50/60 Hz IP55 insulation material class F											
A 220	3BA1600-7AT06	50	2.15	200D ... 240D	345Y ... 415Y	8.5D	4.9Y	-64	60	69	57
A 221	3BA1600-7AT06	60	2.7	220D ... 250D	415Y ... 460Y	7.5D	4.4Y	-64	60	72	57
A 222	3BA1600-7AT16	50	2.95	200D ... 240D	345Y ... 415Y	10.0D	5.8Y	-85	70	70	64
A 223	3BA1600-7AT16	60	3.42	220D ... 250D	415Y ... 460Y	10.3D	6.5Y	-85	76	73	64
A 224	3BA1600-7AT26	50	4.02	200D ... 240D	345Y ... 415Y	12.5D	7.2Y	-104	108	70	75
A 225	3BA1600-7AT26	60	4.62	220D ... 250D	415Y ... 460Y	12.0D	6.5Y	-96	92	73	75
A 226	3BA1600-7AT36	50	5.36	200D ... 240D	345Y ... 415Y	13.0D	7.5Y	-116	145	70	93
A 227	3BA1600-7AT36	60	6.16	220D ... 250D	415Y ... 460Y	15.2D	8.5Y	-128	124	73	93

Suitable for 208 Volt Operation

All curves are rated at 14.7 psia and 68° F ambient conditions and are reported in SCFM referenced to 68° F and 14.696 psia sea level conditions. Curve values are nominal, actual performance may vary by up to 10% of the values indicated. For inlet temperatures above approximately 80° F or for handling gases other than air, please contact your Airtech sales representative for assistance.

AIRTECH[®]

VACUUM

Operating and Maintenance Instructions 3BA Regenerative Blowers



INSTALLATION & OPERATING MANUAL 3BA REGENERATIVE BLOWERS

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1. Safety

1.1 General Safety Precautions

WARNING: Improper operation of 3BA units can result in serious or even fatal injuries. Please make sure all personnel have read and understood this manual before operating the unit.

All personnel should familiarize themselves with the units' specifications and be careful not to exceed the unit's capacity.

Transport, installation, operation, shut-down, maintenance and disposal of 3BA units should be carried out by qualified professionals.

Do not attempt to start or run the unit unless it has been completely assembled. Particular attention should be paid to: the vacuum pump/compressor cover, the muffler on the inlet and discharge connections, and the fan guard.

The standard 3BA unit must never come into contact with flammable substances.

1.2 Clothing and Protective Gear

It is recommended that all personnel wear proper protective gear while operating the unit. This may include eye protection, gloves and helmets.

Please be aware that it is possible for hair and clothing to be pulled into the unit. Avoid wearing loose-fitting clothing near the unit while it is operating and wear a hairnet if necessary.

1.3 Electrical Safety

Electrical installation should only be done by qualified electricians. Before doing any electrical work on a 3BA unit, please ensure that **power to the unit has been disconnected**. Do not attempt to open the unit's terminal box until you have made certain that the unit is not connected to a power source.

The terminal box must be kept free of dirt and moisture at all times. Make sure the terminal box cover and cable entries are tightly sealed so they remain dustproof and waterproof. Check the terminal box regularly to make sure it is sealed and free of debris and moisture.

1.4 Vacuum and Gauge Pressure Safety

In order to avoid dangerous situations associated with vacuum and gauge pressure, please utilize secure mounting elements, connections, lines, fittings, and containers. Pipes/hoses must be securely connected to the inlet and discharge connections. The inlet and discharge connections and the pipes/hoses connected to them must not be closed, clogged, or soiled. Check regularly to ensure that these connections and mountings are not becoming unseated. If necessary, support pipes and hoses to ensure that there is no tension on the connections. **Failure to observe these precautions can lead to sudden evacuation of hazardous fluids or dangerous suction that can pull hair or clothing into the unit.**

1.5 Installation/Start-up

The unit and any lines connected to it must be securely installed. In particular, the feed pipes must be securely routed, e.g. in cable ducts, in the floor, etc.

If a separate control panel or other such interface will be used to start and stop the unit, it should be installed in an area with an unobstructed view of the unit to ensure that it is not switched on while being serviced.

Excess vibration can cause damage to the unit and/or unsafe conditions. Install the unit on a solid foundation or a solid mounting surface. Check screw glands/unions for strength and firm seating.

Cables and pipes should be installed in a recess in the floor or duct so they do not present a tripping hazard.

To ensure sufficient cooling of the unit, ventilation screens and openings must remain clear. Ensure that discharge air from other units cannot be pulled into the unit.

Make sure that the inlet and pressure lines are clearly marked to avoid confusion. **Interchanged inlet and pressure lines can lead to damage to the unit and/or serious injury.**

Install a filter in the inlet pipe and replace it regularly. If particulates or debris enter the unit, the blades of the impellers can be damaged and blades could potentially break off, potentially creating a hazardous situation.

If re-starting the unit after it has been idle for a long period of time, measure the insulation resistance of the motor. If values are less than 1 k Ω per volt of nominal voltage, the winding may be too dry.

If the unit is installed or stored in an environment with a temperature of over 104°F (40°C) be aware that the winding may be damaged and the grease might need to be changed more often.

1.6 Maintenance Procedures

Before beginning work on the pump-motor unit, please take the following precautions:

- Make sure power has been completely disconnected
- Wait for the unit to come to a complete stop.
- Allow the unit time to cool.
- Shut off lines and release pressure
- Make certain that no vacuum or gauge pressure is present in the lines/tanks to be opened.
- Make sure that no fluids can escape

Please note that the rotating impeller is accessible when the inlet and discharge connections are open. Do not reach into the unit through open connections or insert objects into the unit through any openings. Serious injury could occur. If the unit is running without piping or tubing, provide the inlet and discharge of the unit with either additional mufflers or piping of a sufficient length to prevent access to the impeller.

Check regularly to ensure the terminal box is free of any dirt or foreign substances and there is no moisture or humidity present. Make certain the terminal box cover and cable entries are tightly closed.

1.7 Hot Surfaces

During operation, the surface of the unit can reach temperatures of 320° F (160° C). It is advisable to cover the unit with suitable touch protection (e.g. a perforated plate or wire cover). Do not touch the unit during operation, and allow time to cool after shut-down. Temperature-sensitive parts such as lines or electronic components should not come into contact with the surface of the unit.

1.8 Hearing Protection

Make certain any missing or defective silencers are replaced. Noise emitted by the unit can cause serious hearing damage. Conduct a noise measurement test while the unit is running. If the unit operates over 90 dB(A), please place a warning sign in the area where the unit has been installed and make certain that

any personnel working in the vicinity wear ear protection at all times while the unit is running.

1.9 Safety Guidelines for Transport of the unit:

Prior to transport and handling, please make sure that all components are properly assembled and secure. Any machinery used to transport these units must have the proper lifting capacity. Please consult the table on page 27 to find the weight of the unit being handled. Do not stand or walk under suspended loads.

If a 3BA unit has come in contact with any dangerous substances, it must be decontaminated before being sent to Airtech for repair evaluation.

2 Technical Data

These operating instructions cover the Airtech 3BA side channel vacuum pumps and compressors supplied with standard TEFC motors. Other configurations are available including V-belt driven units, units with explosion proof motors, mechanical seals, magnetic drives, coatings and modifications for high pressure service. Airtech can provide any combination of modifications to meet your application requirements. Such blowers, however, are outside the scope of this manual.

Description

All regenerative blowers are dynamic compression devices and utilize a non-contacting impeller to accelerate the gas and a specially designed housing to compress the gas. Cooling is accomplished by using the motor fan to blow air over the housing. In larger models, the housing is specially designed with cooling fins to allow a wider range of operation. Both the inlet and outlet ports have built-in silencers and mesh screens. Both the inlet and outlet have an inside connection thread corresponding to DIN ISO 228. On larger units, multiple suction and discharge connection configurations may be available.

The wetted parts are constructed of Aluminum on all models. The blower shares a bearing with the motor. The seal between the bearing and the motor is not gas tight in most models, therefore these blowers are not recommended for handling of toxic or explosive gases. (Contact Airtech Vacuum, Inc. for additional options if explosive or toxic gases will be handled.)

A full range of accessory items are available, including vacuum or pressure relief valves, check valves, suction filters, motor starters, vacuum/pressure cross-over valves, and in-line filters.

Application/Installation Environment

CAUTION! These blowers are designed for use in general industry. Suitable personnel protection according to OSHA requirements is provided, but the equipment should not be operated in residential settings.

Airtech blowers can be operated as either vacuum pumps or compressors. They are suitable for use with air having a relative humidity up to 90 percent, but not generally suitable for handling corrosive or erosive gases. Special versions for toxic or aggressive gases may be available. Use of the standard blower in aggressive environments may cause damage to the blower or exposure to gases being handled in the local environment.

CAUTION! Dangerous (flammable or explosive) or aggressive (corrosive) gases should not be handled by the standard blower.

Handling of flammable or aggressive gases and vapors may be possible by using a specially configured or modified blower. Contact factory for additional information. The standard blower is not suitable for operation in explosive environments as defined by NFPA 70. Contact factory for assistance.

CAUTION! The ambient and suction temperatures should be between 40 and 105 F. For temperatures outside this region, please contact the factory.

The maximum permissible pressure difference for vacuum or pressure is dependant on the motor rating (See Tables 1 to 4 for detailed information by model number.) and power supply frequency. The figures in Tables 1 to 4 are computed assuming an ambient temperature of 77 F (25 C) and a local barometric pressure of 1013 mbar (sea level). Operation at an ambient temperature of 104 F (40C) is the maximum permissible, and will result in a reduction of 10 percent on maximum vacuum or pressure attainable by the unit. For temperatures between 77 F and 104 F, reduce the maximum pressure reduction is a linear function of temperature.

Table 1. Three-phase, Single Stage, 50 Hertz

Model	Rated Power HP/kW	Voltage	Motor Current (Amps)	Open Flow Capacity CFM/m ³ /hr	Maximum Pressure (mbar)	Sound Pressure Level (dBA)
3BA1300-7AT06	.33/.25	200-240/345-415	2.1/1.2	48/82	-100/100	53
2BA1300-7AT16	.54/.4	200-240/345-415	2.6/1.5	48/82	-120/130	53
3BA1400-7AT06	.94/.7	200-240/345-415	3.8/2.2	84/142	-120/120	63
2BA1400-7AT16	1.15/.85	200-240/345-415	4.2/2.4	84/142	-160/160	63
3BA1400-7AT26	1.75/1.3	200-240/345-415	5.7/3.3	84/142	-170/200	63
3BA1500-7AT06	1.15/.85	200-240/345-415	4.2/2.4	120/204	-100/100	64
3BA1500-7AT16	1.75/1.3	200-240/345-415	5.7/3.3	120/204	-170/170	64
3BA1500-7AT26	2.15/1.6	200-240/345-415	7.5/4.3	120/204	-200/190	64
3BA1500-7AT36	2.96/2.2	200-240/345-415	9.7/5.6	120/204	-220/270	64
3BA1600-7AT06	2.15/1.6	200-240/345-415	8.5/4.9	188/320	-160/150	69
3BA1600-7AT16	2.96/2.2	200-240/345-415	9.7/5.6	188/320	-190/190	69
3BA1600-7AT26	4.04/3.0	200-240/345-415	12.5/7.2	188/320	-260/270	69
3BA1600-7AT36	5.4/4.0	200-240/345-415	13.0/7.5	188/320	-290/360	69
3BA1630-7AT06	2.15/1.6	200-240/345-415	8.5/4.9	240/408	-160/150	69
3BA1630-7AT16	2.96/2.2	200-240/345-415	9.7/5.6	240/408	-190/190	69
3BA1630-7AT26	4.04/3.0	200-240/345-415	12.5/7.2	240/408	-260/270	69
3BA1630-7AT36	5.4/4.0	200-240/345-415	15.6/9.0	240/408	-260/290	69
3BA1800-7AT06	5.4/4.0	200-240/345-415	15.6/9.0	280/476	-200/200	70
3BA1800-7AT16	7.4/5.5	200-240/345-415	23/13.3	280/476	-300/300	70
3BA1800-7AT26	10/7.5	200-240/345-415	29/16.7	280/476	-320/430	70
3BA1830-7AT06	5.4/4	200-240/345-415	15.6/9	400/680	-150/140	76
3BA1830-7AT16	7.4/5.5	200-240/345-415	23/13.3	400/680	-200/190	76
3BA1830-7AT26	10/7.5	200-240/345-415	29/16.7	400/680	-270/260	76
3BA1900-7AT06	10.8/8	200-240/345-415	31.5/18.2	568/965	-190/190	74
3BA1900-7AT16	16.8/12.5	200-240/345-415	48.5/28	568/965	-290/280	74
3BA1900-7AT36	25/18.5	200-240/345-415	64.5/37	568/965	-362/462	74
3BA1930-7AT16	16.8/12.5	200-240/345-415	48.5/28	744/1264	-290/280	71
3BA1930-7AT36	25/18.5	200-240/345-415	64.5/37	744/1264	-310/310	71
3BA1930-7AT36	25/18.5	200-240/345-415	64.5/37	744/1264	-310/310	71
3BA7310-0AT167	.75/.55	200-240/345-415	2.8/1.6	40/68	-250/250	57
3BA7410-0AT167	1.5/1.1	200-240/345-415	5.4/3.1	50/84	-300/380	58
3BA7510-0AT168	2/1.5	200-240/345-415	7.5/4.3	70/120	-370/650	64
3BA7510-0AT268	3/2.2	200-240/345-415	9.7/5.6	70/120	-310/430	64
3BA7610-0AT168	3/2.2	200-240/345-415	9.7/5.6	96/163	-310/430	65
3BA7610-0AT368	4.4/3.3	200-240/345-415	13/7.5	96/163	-500/750	65

Table 2. Three-phase, Single-stage, 60 Hz

Model	Rated Power HP/kW	Voltage	Motor Current (Amps)	Open Flow Capacity CFM/m ³ /hr	Maximum Pressure (mbar)	Sound Pressure Level (dBA)
3BA1300-7AT06	.39/.29	220-250/415-460	1.74/1.0	60/102	-100/100	56
2BA1300-7AT16	.67/.5	220-250/415-460	2.6/1.5	60/102	-150/160	56
3BA1400-7AT06	1.12/.83	220-250/415-460	3.75/2.15	105/179	-130/130	64
3BA1400-7AT16	1.28/.95	220-250/415-460	4.35/2.5	105/179	-160/160	64
3BA1400-7AT26	2/1.5	220-250/415-460	5.5/3.2	105/179	-210/200	64
3BA1500-7AT06	1.28/.95	220-250/415-460	4.35/2.5	150/255	-80/70	70
3BA1500-7AT16	2/1.5	220-250/415-460	5.5/3.2	150/255	-150/140	70
3BA1500-7AT26	2.7/2.05	220-250/415-460	7.5/4.4	150/255	-220/210	70
3BA1500-7AT36	3.4/2.55	220-250/415-460	9.0/5.3	150/255	-260/290	70
3BA1600-7AT06	2.7/2.05	220-250/415-460	7.5/4.4	235/400	-160/150	72
3BA1600-7AT16	3.4/2.55	220-250/415-460	9.0/5.3	235/400	-190/190	72
3BA1600-7AT26	4.6/3.45	220-250/415-460	12.0/6.5	235/400	-240/230	72
3BA1600-7AT36	6.1/4.6	220-250/415-460	15.2/8.5	235/400	-320/310	72
3BA1630-7AT06	2.7/2.05	220-250/415-460	7.5/4.4	300/510	-160/150	72
3BA1630-7AT16	3.4/2.55	220-250/415-460	9.0/5.3	300/510	-190/190	72
3BA1630-7AT26	4.6/3.45	220-250/415-460	12.0/6.5	300/510	-240/230	72
3BA1630-7AT36	6.1/4.6	220-250/415-460	15.2/8.5	300/510	-260/260	72
3BA1800-7AT06	6.1/4.6	220-250/415-460	15.2/8.5	350/595	-160/160	74
3BA1800-7AT16	8.4/6.3	220-250/415-460	20/11.2	350/595	-300/280	74
3BA1800-7AT26	11.5/8.6	220-250/415-460	27.5/15	350/595	-350/400	74
3BA1830-7AT06	6.2/4.6	220-250/415-460	15.2/8.5	500/850	-90/90	79
3BA1830-7AT16	8.4/6.3	220-250/415-460	20/11.2	500/850	-180/180	79
3BA1830-7AT26	11.5/8.6	220-250/415-460	27.5/15	500/850	-270/260	79
3BA1900-7AT06	12.1/9	220-250/415-460	31.5/18.2	710/1207	-150/140	79
3BA1900-7AT16	19.5/14.5	220-250/415-460	50/29	710/1207	-270/260	79
3BA1900-7AT36	28.7/21.3	220-250/415-460	68/39	710/1207	-382/422	79
3BA1930-7AT16	19.5/14.5	220-250/415-460	50/29	930/1581	-270/260	75
3BA1930-7AT36	28.7/21.3	220-250/415-460	68/39	930/1581	-300/280	75
3BA7210-0AT167	1.1/.83	220-250/415-460	3.75/2.15	35/60	-270/320	62
3BA7310-0AT167	1.1/.83	220-250/415-460	3.75/2.15	48/82	-260/250	62
3BA7410-0AT167	2/1.5	220-250/415-460	5.5/3.2	60/102	-340/370	62

When operating at altitudes above 3280 feet (1000 m) above mean sea level, contact Airtech Inc.

CAUTION! Operation of the unit outside the recommended range of pressures and ambient conditions will result in shorted operating life.

Table 3. 3 Phase, Two/Three Stage, 50 Hertz

Model	Rated Power HP/kW	Voltage	Motor Current (Amps)	Open Flow Capacity CFM/m3/hr	Maximum Pressure (mbar)	Sound Pressure Level (dBA)
3BA1310-7AT26	.94/.7	200-240/345-415	3.8/2.2	48/81.6	-120/120	55
3BA1410-7AT36	2.15/1.6	200-240/345-415	7.5/4.3	84/142.8	-200/190	66
3BA1410-7AT46	2.96/2.2	200-240/345-415	9.7/5.6	84/142.8	-320/420	66
3BA1510-7AT46	4.04/3.0	200-240/345-415	12.5/7.2	121.6/206.7	-340/410	72
3BA1510-7AT56	5.39/4.0	200-240/345-415	17.4/10	121.6/206.7	-390/440	72
3BA1610-7AT36	2.9/2.2	200-240/345-415	9.7/5.6	188/319.6	-190/190	73
3BA1610-7AT26	4.04/3.0	200-240/345-415	12.5/7.2	188/319.6	-260/270	73
3BA1610-7AT36	5.39/4.0	200-240/345-415	13.0/7.5	188/319.6	-290/360	73
3BA1610-7AT46	7.41/5.5	200-240/345-415	23/13.3	188/319.6	-420/500	73
3BA1610-7AT56	10.1/7.5	200-240/345-415	29/16.7	188/319.6	-420/610	73
3BA1640-7AT36	5.39/4.0	200-240/345-415	13.0/7.5	280/476	-290/360	74
3BA1640-7AT46	7.41/5.5	200-240/345-415	23/13.3	280/476	-420/500	74
3BA1640-7AT56	10.1/7.5	200-240/345-415	29/16.7	280/476	-420/610	74
3BA1810-7AT16	7.4/5.5	200-240/345-415	23/13.3	280/476	-420/500	74
3BA1810-7AT26	10.1/7.5	200-240/345-415	29/16.7	280/476	-320/430	74
3BA1810-7AT36	14.8/11	200-240/345-415	29/16.7	280/476	-430/600	74
3BA1810-7AT46	20.2/15	200-240/345-415	56.5/32.5	280/476	-460/670	74
3BA1840-7AT26	10.1/7.5	200-240/345-415	29.0/16.7	280/476	-320/430	74
3BA1840-7AT36	14.8/11.0	200-240/345-415	48.5/28.0	280/476	-430/600	74
3BA1910-7AT16	16.8/12.5	200-240/345-415	48.5/28	624/1061	-290/280	74
3BA1910-7AT36	26.95/20.0	200-240/345-415	69/40	624/1061	-443/502	74
3BA19437AT26	20.1/15	200-240/345-415	59/34	1200/2040	-160/170	75
3BA19437AT36	26.8/20	200-240/345-415	69/40	1200/2040	-250/230	75
3BA19437AT46	33.5/25	200-240/345-415	90/52	1200/2040	-310/280	75
3BA7220-0AT567	2/1.5	200-240/345-415	7.5/4.3	28/48	-370/650	58
3BA7320-0AT467	1.5/1.1	200-240/345-415	5.4/3.1	40/68	-300/380	58
3BA7320-0AT567	2/1.5	200-240/345-415	7.5/4.3	40/68	-480/450	59
3BA7420-0AT267	2/1.5	200-240/345-415	7.5/4.3	50/84	-480/450	61
3BA7420-0AT567	4.4/3.3	200-240/345-415	13/7.5	50/84	-500/750	61
3BA7520-0AT268	3/2.2	200-240/345-415	9.7/5.6	70/120	-470/460	64
3BA7620-0AT368	4.4/3.3	200-240/345-415	13/7.5	96/163	-500/750	68
3BA7620-0AT468	5.4/4	200-240/345-415	14/8.1	96/163	-370/650	67
3BA7620-0AT568	7.5/5.5	200-240/345-415	19.9/11.5	96/163	-520/750	68
3BA7630-0AT668	10.1/7.5	200-240/345-415	29/16.7	96/163	-420/610	77

Table 4. 3 Phase, Two/Three Stage, 60 Hertz

Model	Rated Power HP/kW	Voltage	Motor Current (Amps)	Open Flow Capacity CFM/m3/hr	Maximum Pressure (mbar)	Sound Pressure Level (dBA)
3BA1310-7AT26	1.11/.83	220-250/415-460	3.75/2.15	60/102	-130/130	61
3BA1410-7AT36	2.7/2.05	220-250/415-460	7.5/4.4	105/179	-220/210	69
3BA1410-7AT46	3.4/2.55	220-250/415-460	9.0/5.3	105/179	-350/440	69
3BA1510-7AT46	4.6/3.45	220-250/415-460	12.0/6.5	152/258	-380/360	74
3BA1510-7AT56	6.1/4.6	220-250/415-460	15.2/8.5	152/258	-410/480	74
3BA1610-7AT36	3.4/2.55	220-250/415-460	9.0/5.3	235/400	-190/190	76
3BA1610-7AT26	4.6/3.45	220-250/415-460	12.0/6.5	235/400	-240/230	76
3BA1610-7AT36	6.4/4.8	220-250/415-460	16.5/9.8	235/400	-320/310	76
3BA1610-7AT46	8.4/6.3	220-250/415-460	20/11.2	235/400	-440/440	76
3BA1610-7AT56	11.5/8.6	220-250/415-460	27.5/15.0	235/400	-440/670	76
3BA1640-7AT36	6.1/4.6	220-250/415-460	15.2/8.5	350/595	-320/310	78
3BA1640-7AT46	8.4/6.3	220-250/415-460	20.0/11.2	350/595	-440/440	78
3BA1640-7AT56	11.5/8.6	220-250/415-460	27.5/15.0	350/595	-440/670	78
3BA1810-7AT16	8.4/6.3	220-250/415-460	20.0/11.2	350/595	-440/440	78
3BA1810-7AT26	11.5/8.6	220-250/415-460	27.5/15.0	350/595	-350/400	78
3BA1810-7AT36	17/12.6	220-250/415-460	50.2/29.0	350/595	-460/600	78
3BA1810-7AT46	23.3/17.3	220-250/415-460	60.0/34.5	350/595	-490/750	78
3BA1840-7AT26	11.5/8.6	220-250/415-460	27.5/15.0	350/595	-350/400	78
3BA1840-7AT36	17/12.6	220-250/415-460	50.2/29.0	350/595	-460/600	78
3BA1910-7AT16	19.5/14.5	220-250/415-460	50.0/29.0	780/1326	-270/260	84
3BA1910-7AT36	31/23	220-250/415-460	72 /42	780/1326	-443/433	84
3BA19437AT26	23.4/17.5	220-250/415-460	63/36.5	1440/2447	-120/110	84
3BA19437AT36	30.8/23	220-250/415-460	72/42	1440/2447	-190/180	84
3BA19437AT46	38.8/28.9	220-250/415-460	90/52	1440/2447	-265/230	84
3BA7220-0AT567	2.7/2.05	220-250/415-460	7.5/4.4	35/60	-500/740	62
3BA7320-0AT467	2/1.5	220-250/415-460	5.5/3.2	48/82	-340/370	63
3BA7320-0AT567	2.7/2.05	220-250/415-460	7.5/4.4	48/82	-430/410	63
3BA7420-0AT267	2.7/2.05	220-250/415-460	7.5/4.4	60/102	-430/410	66
3BA7420-0AT567	5.1/3.8	220-250/415-460	13.5/7.8	60/102	-510/850	66
3BA7520-0AT268	3.4/2.55	220-250/415-460	9/5.3	84/143	-500/450	70
3BA7620-0AT368	5.1/3.8	220-250/415-460	13.5/7.8	115/196	-510/850	71
3BA7620-0AT468	6.1/4.6	220-250/415-460	15.2/8.5	115/196	-480/500	71
3BA7620-0AT568	8.4/6.6	220-250/415-460	22.5/12.6	115/196	-520/820	72
3BA7630-0AT668	11.5/8.6	220-250/415-460	27.5/15	115/196	-440/670	80

Table 5. Single Phase, 50 Hertz

Model	Rated Power HP/kW	Voltage	Motor Current (Amps)	Open Flow Capacity CFM/m3/hr	Maximum Pressure (mbar)	Sound Pressure Level (dBA)
3BA1100-7AS05	0.27/0.2	230	1.45	24/40	-60/70	50
3BA1200-7AS05	0.33/0.25	115/230	3.5/1.7	35/60	-100/100	50
3BA1300-7AS15	0.5/0.37	115/230	5.4/2.7	48/82	-110/110	53
3BA1330-7AS15	0.5/0.37	115/230	5.4/2.7	60/102	-110/110	54
3BA1400-7AS25	1.47/1.09	115/230	13/6.5	84/142	-149/189	64
3BA1410-7AS25	2/1.49	115/230	22/11	84/142.8	-279/259	66
3BA1500-7AS35	2/1.49	115/230	22/11	120/204	-189/199	64
3BA7210-OAS75	0.74/0.55	115/230	13/6.5	35/60	-229/289	57
3BA7220-OAS75	2/1.49	115/230	19.4/9.7	29/49	-371/600	57
3BA7310-OAS75	1.26/0.93	115/230	15.2/7.6	40/68	-249/351	58
3BA7320-OAS75	2/1.49	115/230	19.4/9.7	40/68	-401/550	59
3BA7410-OAS45	1.47/1.09	115/230	13/6.5	50/84	-299/381	59

Table 6. Single Phase, 60 Hertz

Model	Rated Power HP/kW	Voltage	Motor Current (Amps)	Open Flow Capacity CFM/m3/hr	Maximum Pressure (mbar)	Sound Pressure Level (dBA)
3BA1100-7AS05	0.31/0.23	230	1.3	24/40	-75/80	53
3BA1200-7AS05	0.38/0.28	115/230	5/2.8	35/60	-112/112	53
3BA1300-7AS15	0.6/0.44	115/230	6.0/3.0	48/82	-130/139	56
3BA1330-7AS15	0.6/0.44	115/230	6.0/3.0	60/102	-130/139	57
3BA1400-7AS25	1.74/1.29	115/230	14.0/7.0	84/142	-179/189	64
3BA1410-7AS25	2.35/1.75	115/230	24.0/12.0	84/142.8	-249/229	69
3BA1500-7AS35	2.35/1.75	115/230	24.0/12.0	120/204	-179/179	70
3BA7210-OAS75	0.84/0.63	115/230	14.2/7.1	35/60	-259/309	62
3BA7220-OAS75	2.35/1.75	115/230	20.6/10.3	29/49	-421/660	62
3BA7310-OAS75	1.47/1.09	115/230	18.0/9.0	40/68	-279/391	62
3BA7320-OAS75	2.35/1.75	115/230	20.6/10.3	40/68	-391/541	63
3BA7410-OAS45	1.74/1.29	115/230	14.0/7.0	50/84	-338/391	62

Operation of any blower is possible at 87 Hertz without modification in most cases. When using a VFD to operate the blower at this frequency, refer to the nameplate for limits on vacuum and pressure, current draw and motor performance.

If your specific model number is not listed above, please consult the nameplate on the unit for electrical data. If the model you are installing is listed above, please confirm the data on the nameplate. Data in Tables 1 through 4 is subject to change and is approximate. Be sure to confirm necessary operating data what that on the nameplate before commissioning the unit.

CAUTION! Do not operate any 3BA blower above 87 Hz without consultation with the factory. Failure of the blower motor is possible when operating out of range. Consult with the factory for assistance.

Expected temperature rise of the handled gas at maximum allowable pressure differential and when operating at sea level is indicated below:

Table 7: Single Stage – Approximate Temperature Rise

Blower Model	Maximum Rise at 50 Hz speed		Maximum Rise at 60 Hz speed	
	Degrees F	Degrees C	Degrees F	Degrees C
3BA1100-7..0.	115	64	136	76
3BA1200-7..0.	65	36	101	56
3BA1300-7..0.	90	50	77	43
3BA1300-7..1.	90	50	140	78
3BA1300-7..2.	90	50	158	88
3BA1400-7..0.	99	55	86	48
3BA1400-7..1.	129	72	122	68
3BA1400-7..2.	149	83	167	93
3BA1500-7..0.	86	48	72	40
3BA1500-7..1.	115	64	97	54
3BA1500-7..2.	138	77	122	68
3BA1500-7..3.	203	113	180	100
3BA1500-7..6.	248	138	248	138
3BA1600-7..0.	81	45	68	38
3BA1600-7..1.	145	81	104	58
3BA1600-7..2.	171	95	176	98
3BA1600-7..3.	225	125	185	103
3BA1600-7..6.	248	138	194	108
3BA1600-7..7.	248	138	248	138
3BA1800-7..0.	104	58	104	58
3BA1800-7..1.	153	85	185	103
3BA1800-7..2.	248	138	221	123
3BA1900-7..0.	97	54	95	53
3BA1900-7..1.	182	101	155	86
3BA1900-7..3.	230	128	212	118
3BA1943-7..2.	85	47	75	42
3BA1943-7..3.	130	72	100	56
3BA1943-7..4.	180	100	140	78
3BA7210-0..1..	126	70	142	79
3BA7310-0..1..	142	79	142	79
3BA7310-0..2..	178	99	187	104
3BA7410-0..1..	194	108	214	119
3BA7510-0..1..	199	111	232	129
3BA7510-0..2..	248	138	234	130
3BA7610-0..1..	244	136	255	142
3BA7610-0..3..	244	136	255	142

Table 8: Two/Three Stage – Approximate Temperature Rise

Blower Model	Maximum Rise at 50 Hz speed		Maximum Rise at 60 Hz speed	
	Degrees F	Degrees C	Degrees F	Degrees C
3BA1310-7..2.	127	71	165	92
3BA1410-7..3.	154	86	149	83
3BA1410-7..4.	181	101	180	100
3BA1510-7..4.	190	106	176	98
3BA1510-7..5.	194	108	201	112
3BA1610-7..1.	92	51	86	48
3BA1610-7..2.	129	72	118	66
3BA1610-7..3.	176	98	167	93
3BA1610-7..4.	221	123	190	106
3BA1610-7..5.	246	137	266	148
3BA1610-7..7.	176	98	167	93
3BA1610-7..8.	176	98	248	138
3BA1810-7..1.	113	63	80	45
3BA1810-7..2.	185	103	140	78
3BA1810-7..3.	248	138	248	138
3BA1910-7..1.	119	66	115	64
3BA1910-7..2.	203	113	169	94
3BA1910-7..3.	248	138	274	152
3BA7220-0..2..	131	73	171	95
3BA7220-0..5..	165	92	230	128
3BA7320-0..5..	178	99	255	142
3BA7420-0..2..	192	107	176	98
3BA7420-0..5..	250	139	243	135
3BA7520-0..2..	192	107	216	120
3BA7520-0..7..	257	143	230	128
3BA7620-0..3..	255	142	259	144
3BA7620-0..5..	255	142	262	146
3BA7630-0..6..	248	138	248	138

Table 9: Tightening Torque Specifications

For non-electrical connections

Thread	Ft-lbs maximum torque	Nm maximum torque
M4	2.43	3.3
M5	3.25	4.4
M6	6.49	8.8
M8	19.47	26.4
M10	34.10	46.2
M12	56.76	77

For electrical connections

Thread	Ft-lbs torque	Nm torque
M4	0.6 to 0.9	0.8 to 1.2
M5	1.3 to 1.8	1.3 to 1.8

For metal threaded glands/unions

Thread	Ft-lbs maximum torque	Nm maximum torque
M12x1.5	3 to 4.5	4 to 6
M16x1.5	3.7 to 5.5	5 to 7.5
M20x1.5	4.4 to 6.6	6 to 9
M32x1.5	5.9 to 8.9	8 to 12
M40x1.5	5.9 to 8.9	8 to 12

For plastic threaded glands/unions

Thread	Ft-lbs maximum torque	Nm maximum torque
M12x1.5	1.5 to 2.6	2 to 3.5
M16x1.5	2.2 to 3	3 to 4
M20x1.5	3 to 3.7	4 to 5
M32x1.5	3.7 to 5.2	5 to 7
M40x1.5	3.7 to 5.2	5 to 7

Operating above the indicated maximum pressure or vacuum would overload the motor and/or overheat the unit. In addition to the maximum allowable pressure difference, careful consideration should be given to matching the motor protection devices (provided by others) to the expected current draw. In no case should the blower be operated with inadequate motor overload protection.

Since regenerative blowers are dynamic compression devices, the performance limits shown in Tables 1 to 4 are applicable only for a gas with the same specific gravity, dynamic viscosity and chemical characteristics as air. For gases with different physical properties than air, the limits will be different from those shown in the tables. Please contact Airtech for assistance in determining the proper blower size and configuration if handling gases other than air.

A vacuum relief valve or pressure relief valve should always be installed at the suction or discharge of the regenerative blower. This will prevent operation outside the applicable ranges shown in Tables 1 to 4. If the relief valves were not specified in the ordering process, please contact Airtech for details, price and availability of the needed valves before commissioning the unit. Failure to use the proper relief valve may result in failure of the blower due to operation outside the applicable limits; any such failure is outside the scope of Airtech's standard warranty.

WARNING! Be sure to install the necessary personnel protection devices if unexpected shut-down of the unit presents danger of death or injury.

3. Installation

As illustrated in Figure 1, the Airtech 3BA blower can be installed in any physical configuration.

CAUTION! Regenerative blowers can have surface temperatures in excess of 320° F. To avoid burns or other physical injury, take care to avoid contact with the surfaces of the blower during and immediately after operation.

To ensure adequate cooling of the blower during operation, install the blower with the minimum clearance as indicated in the table below.

Minimum installation clearances, 3BA blowers

Range	Distance from fan guard to closest obstruction. (inches/mm)	Distance from cover (opposite of fan) to closest obstruction. (inches/mm)
3BA11 through 3BA14	1.4/34	0.79/20
3BA15 through 3BA19	2.1/53	1.57/40
3BA72 and 3BA73	1.3/34	1.18/30
3BA74 through 3BA76	2.1/54	1.18/30

Please note that it may be desirable, where possible, to allow for larger clearances to allow access for maintenance or repair personnel. The noted clearances are to ensure adequate air flow for cooling only and are a minimum requirement.

Failure to allow for the noted clearances may result in premature failure of the blower due to lack of cooling, even if all other precautions are taken as recommended. For specific advice about installations requiring closer clearances, please contact Airtech, Inc. for recommendations.

Airtech regenerative blowers can be mounted in any configuration, either horizontally or vertically mounted. It is not usually necessary to bolt the smaller blowers to a rigid surface during operation, though this may be desirable to reduce pipe vibration, movement and noise. Larger models should be bolted in place, especially when installed vertically, to prevent possible rotation, damage or injury due to start-up torque.

CAUTION! For installations at altitudes greater than 3250 Feet above sea level there will be a loss in capacity. Please contact your factory representative for assistance in determining the extent of the loss of capacity likely at your specific location.

WARNING! Be sure to follow all local codes and regulations with respect to installation and operation of the blower. The blower motor should be wired to a branch circuit disconnect and all other safety devices recommended by the relevant sections of NFPA 70, National Electrical Code, and in accordance with all applicable state and local regulations and requirements.

3.1 Installation Procedure

Perform the installation exactly in accordance with the following steps:

1. For vacuum operation, connect the suction pipe to connection A, and for pressure operation connect the pressure pipe to connection B (See Figure 1). Install startup screens before startup to protect pump from debris.

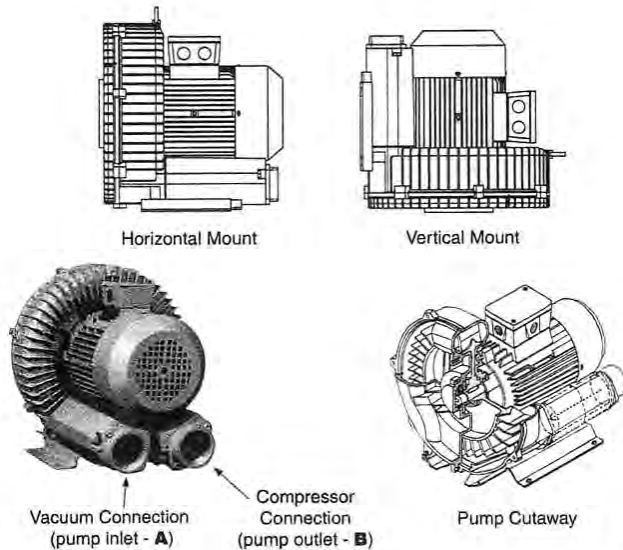


Figure 1

CAUTION! Design your piping system to avoid unnecessary pressure loss, which may significantly affect the operation of any regenerative blower. Contact your Airtech representative for assistance in designing and configuring an appropriate piping system for your application.

For alternation between vacuum and pressure in any application, changeover valves are available. Use of the changeover valve allows the same connection to be used for both vacuum and pressure.

2. The electrical data shown in Tables 1 to 4 (pages 10-14) should be confirmed by examination of the motor data plate on your 3BA blower. The standard motor features Class F insulation as a standard and are UL recognized for applications in both Canada and the United States (CUL). Motors are IEC design IP55, equal to a NEMA TEFC motor design. The connection diagram for the motors can be found in the inside of the terminal box cover. Be sure to confirm that your electrical supply has sufficient capacity to operate the blower according to the nameplate requirements.

3. A magnetic motor starter should always be used to connect the motor to the power supply. It is advisable to use thermal overload motor starters to provide maximum protection for the motor and wiring. All cabling used on starters should be secured with good quality cable clamps.

We recommend that the motor starters used feature a time delay trip on high amperage to avoid nuisance trips on start-up. When the unit is started cold, over amperage may be experienced for a short time due to the higher resistance of the windings at lower temperatures.

If using a change over or solenoid valve, ensure that the voltage connected to the valve matches that shown on the valve instructions or nameplate. Most valves are rated for 110 Volts 60Hz or 220 Volts 50 Hz. Connection of these valves to higher voltages may result in immediate valve failure.

WARNING! The electrical installation should be made by a qualified electrician and in complete compliance with all NFPA 70 (National Electrical Code) requirements along with all state and local code requirements. The main disconnect and motors starters are assumed to be provided by others.

4. Install the necessary relief valves and confirm their proper operation.

4. Start-up

CAUTION! Do not start the blower motor more than 10 times in one hour. If multiple and frequent start-ups are required by your application, install a minimum run timer in the motor control circuit to avoid decreased motor life and possible fire due to over-starting of the motor.

1.1 Start-up Procedure

1. Before operation, confirm the correct direction of rotation by jogging (switching rapidly on and off) the motor and observing the motor fan rotation in the same direction as the arrow. If the direction of rotation is incorrect, lock out the power and switch two leads (three phase) or rewire (single phase) to effect the opposite rotation direction. Recheck the direction of rotation before proceeding.

2. Do not operate the blower at pressure or vacuum ranges that exceed those shown in Tables one through four for the model being installed. This can be achieved by use of the recommended relief valve shown in Table 5.

Note: Relief valves that have been factory pre-set have a label indicating the set pressure and an arrow indicating the direction of flow. The arrow will point into the pipe when installed in vacuum applications and out of the pipe when installed in pressure applications. Do not re-set the relief valve if it has been pre-set from the factory.

In the event the relief valve setting needs to be reset, adjust the set screw to increase or decrease the tension on the spring. Place the blower in operation and note the current draw of the motor. When the current draw of the motor is near the maximum noted on the motor nameplate, tighten the locking nut on the valve and proceed.

3. When checking the current draw of the motor with an ammeter, be sure to confirm the voltage at the motor junction box. Low voltage conditions may result in difficulty starting or in unexpected motor failure or motor starter trips.

1.2 Potential Risks For Operators

Noise emission: Free field noise limits are indicated in Tables 1-4 (pages 10-14). Hearing protection is not normally required at the expected noise generation levels in the table; however, local conditions may result in higher ambient noise. If this is the case and local noise exceeds OSHA recommended levels for expected exposure time (typically 85 dBA for eight hours), hearing protection should be used.

5. Maintenance and Servicing

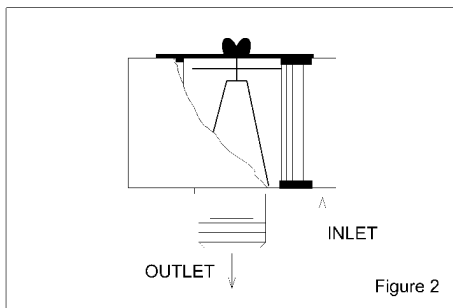
WARNING! Be sure the power supply is disconnected and locked out before attempting to do any maintenance on the unit. It is critical that the unit be locked out from starting during maintenance as severe injury or death could result from exposure to high voltage or rotating parts.

CAUTION! Allow the blower to cool to a surface temperature of less than 100 F before attempting maintenance. Prolonged exposure to temperatures above 120F can cause severe burns.

Clean the blower surfaces periodically to avoid build up of dust or other debris. Build up of debris can cause overheating and premature failure of the blower.

If an inlet filter is being use, ensure that it remains clean during operation by examining the filter cartridge for debris build up. Replace dirty or clogged filter cartridges.

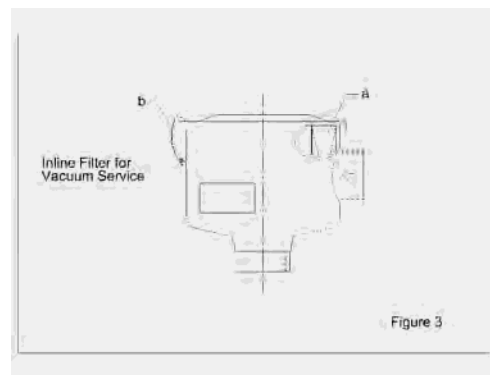
On pressure units, periodically clean the inlet mesh screen to avoid loss of capacity. If an external inlet filter is used, the filter element should be cleaned monthly or as frequently as required by local conditions. Excessive pressure drop will develop from use of clogged or dirty filters. This pressure drop will degrade blower performance and increase operating temperatures, leading possibly to premature pump failure.



To replace the filter, remove the wing nut and cover. Remove the element and either clean with compressed air or replace. Reassemble in reverse order.

For vacuum applications, the optional in-line vacuum filter must be cleaned regularly, depending on local conditions. Cleaning can be achieved by blowing out with compressed air. If cleaning is not possible, replace the cartridge. Access the cartridge by unhooking the relevant clips and removing the cover.

CAUTION! Do not attempt to check the filter cartridge during operation of the blower. Only check the cartridge after disconnecting the power from the blower and locking out the power to prevent an unexpected start.



Bearings require regreasing with Exxon/Esso UNIREX N3 or equal grease after approximately 20,000 operating hours (normal conditions) or between 2 and 3 years after installation and commissioning. Do not mix grease types.

5.1 Troubleshooting Chart

Fault	Cause	Remedy	Responsible Party
Motor does not start, no noise.	Two or more power legs interrupted	Check fuses, terminals, etc.. for source of interruption and correct.	Electrician
Motor does not start, humming noise.	One power supply lead interrupted	Check fuses, terminals, etc.. for source of interruption and correct.	Electrician
	Impeller is jammed.	Open blower cover, remove debris, clean.	Service Technician
		Check impeller clearance and reset if necessary.	
	Defective Impeller	Replace impeller.	Service Technician
Defective Bearing	Replace defective bearing.	Service Technician	
Trip of motor starter at start-up	Incorrect starter setting	Ensure starter setting is correct (check current on nameplate)	Electrician
	Winding short-circuit	Megger motor	Electrician
	Motor overloaded due to operation of pump at excessive differential pressures.	Inspect filters, mufflers and connection pipes and clean as required. Check relief valve operation. Reset or replace as necessary.	Operator
	Impeller Jammed	See above fault Motor does not start, humming noise, cause jammed impeller.	Operator
Excessive Power Consumption	Lime or other deposits	Decalcify or clean unit as required (see Maintenance Chart)	Operator
No Vacuum or Pressure.	Severe leak in system	Close off pump and run deadheaded to confirm pump is operating properly. If so, find and fix leak in the system.	Operator
	Wrong direction of rotation	Check air flow direction and change direction of rotation if necessary.	Operator Electrician

Fault	Cause	Remedy	Responsible Party
Insufficient Vacuum	System too small	Use larger system	Operator
	Inlet piping too long or too small.	Increase pipe diameter to reduce pressure loss in inlet piping. Contact Airtech for assistance in determining correct pipe size.	Operator
	Leak at connection to vacuum system.	Check for leaks and repair if necessary.	Operator
	Density of gas handles different from air.	Consider increased limits on operation due to density differences. Consult Airtech, Inc. for assistance.	Airtech Engineering
	Change in impeller geometry due to erosion	Clean impeller and examine for wear. Replace if necessary.	Service Technician
	Inlet filter clogged.	Change filter element; remove clog.	Operator
	Vacuum relief valve incorrectly set.	Reset or replace vacuum relief valve. Contact Airtech for assistance.	Operator
	Seal defective.	Replace seal.	Service Technician
Abnormal flow noises.	Flow speed too high.	Clean pipes or use larger pipes to connect unit to process.	Operator
	Muffler soiled.	Clean muffler inserts, replace if necessary.	Operator
Abnormal running noise	Ball bearing defective or insufficient lubrication on bearing.	Re-grease or replace bearing as required.	Service Technician
Compressor leaky	Seals on muffler defective.	Tighten muffler connection. Replace gasket if necessary.	Operator
	Seals in motor area defective	Replace as necessary.	Service Technician

WARNING! Before attempting an on-site repair, ensure that a qualified electrician has disconnected the motor from the power supply so that accidental starting of the motor is impossible.

After repairing the unit, be sure to follow the instructions noted in this manual in the **Installation** section (page 20).

5.2 Lifting

For smaller units (less than 65 lbs/ 30 kgs), it may be possible to lift the units manually. When doing so, be sure to understand the weight of the unit being lifted and to follow good lifting safety procedures.

Model	Weight Lbs/kgs	Model	Weight Lbs/kgs
3BA1300-7AT06	20/9	3BA1310-7AT26	33/15
2BA1300-7AT16	22/10	3BA1410-7AT36	55/25
3BA1400-7AT06	29/13	3BA1410-7AT46	59.5/29
3BA1400-7AT26	37.5/17	3BA1510-7AT46	86/39
3BA1500-7AT06	40/18	3BA1510-7AT56	97/44
3BA1500-7AT16	46.5/21	3BA1610-7AT26	104/47
3BA1500-7AT26	51/23	3BA1610-7AT36	119/54
3BA1500-7AT36	55/25	3BA1610-7AT46	163/74
3BA1600-7AT06	57.5/26	3BA1610-7AT56	172/78
3BA1600-7AT16	64/29	3BA1640-7AT36	128/58
3BA1600-7AT26	75/34	3BA1640-7AT46	172/78
3BA1600-7AT36	90.5/41	3BA1640-7AT56	181/82
3BA1800-7AT06	128/58	3BA1810-7AT16	250/113
3BA1800-7AT16	143/65	3BA1810-7AT26	260/118
3BA1800-7AT26	150/68	3BA1810-7AT36	316/143
3BA1900-7AT06	265/120	3BA1810-7AT46	341/155
3BA1900-7AT16	314/142	3BA1840-7AT26	260/118
3BA19437AT26	417/190	3BA1840-7AT36	316/143
3BA19437AT36	463/210	3BA1910-7AT16	409/186
3BA19437AT46	509/231	3BA1910-7AT36	455/206
3BA7210-0AT167	35.3/16	3BA7220-0AT567	61.7/28
3BA7310-0AT167	35.3/16	3BA7320-0AT567	66.1/30
3BA7410-0AT167	50.7/23	3BA7420-0AT267	72.7/33
3BA7510-0AT168	57.3/26	3BA7420-0AT567	86/39
3BA7510-0AT268	63.9/29	3BA7520-0AT268	88.2/40
3BA7610-0AT168	70.5/32	3BA7620-0AT368	106/48
3BA7610-0AT368	77.2/35	3BA7620-0AT568	143/65
		3BA7630-0AT668	207/94

When lifting 3BA15 through 3BA19 (but not 3BA1943 units) or the 3BA75 through the 3BA76, use the eye bolt provided (eye bolts are not included on smaller units). One attachment point should be sufficient. Ensure that the crane is rated for the weight being lifted.

For the 3BA1943, use the eye bolt and the holes in the feet of the blower to lift and maintain a balanced load.

5.3 Storage

The 3BA units should be stored in a clean, dry environment. If stored in an area with a humidity of greater than 80 percent, store in a closed container with desiccant drying agents to avoid damage.

5.4 Disposal

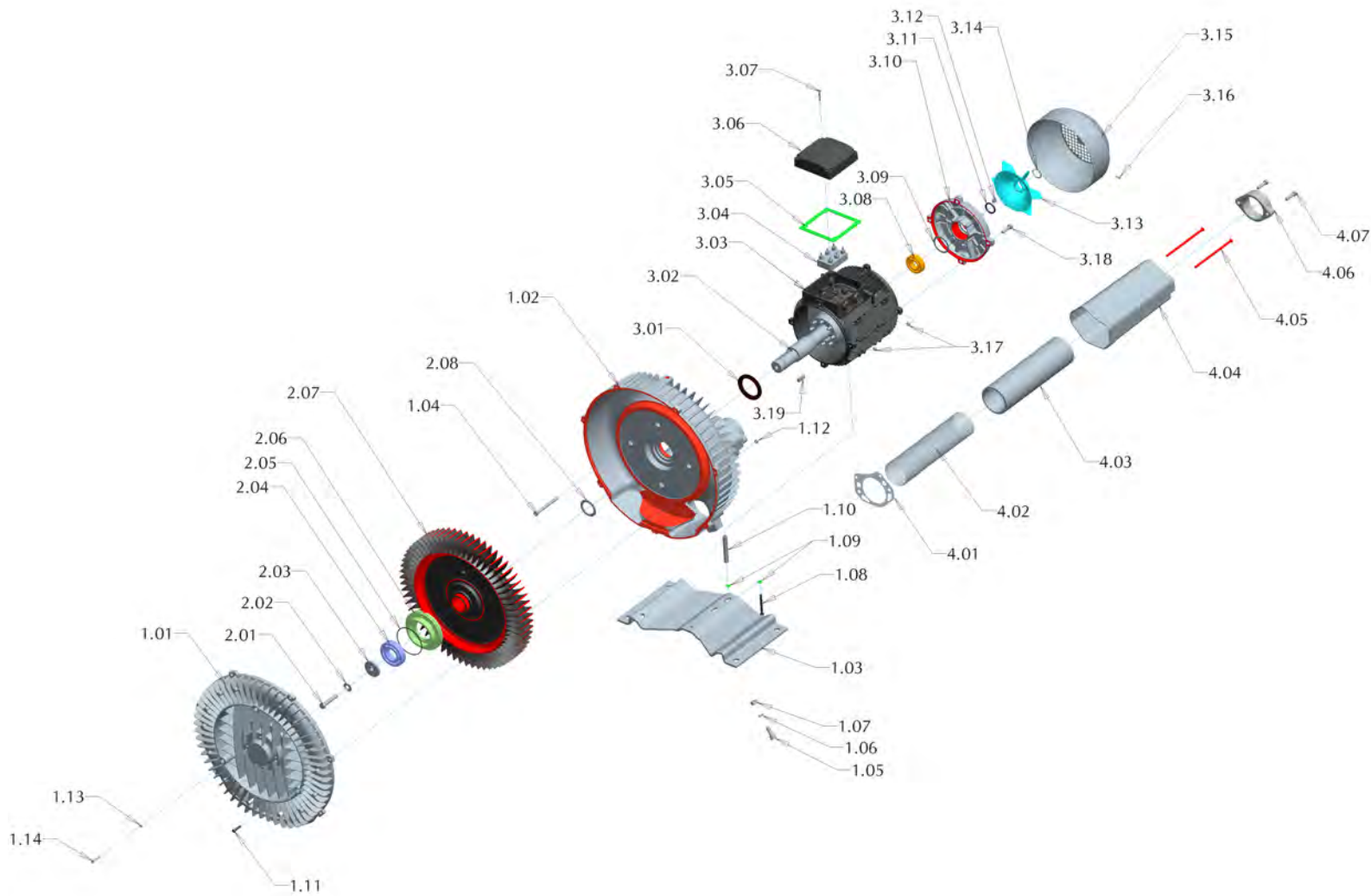
Dispose in accordance with all local health and safety regulations.

Spare parts list are available from your local Airtech service center. Please contact your local Airtech representative for assistance.

For additional assistance, please contact:

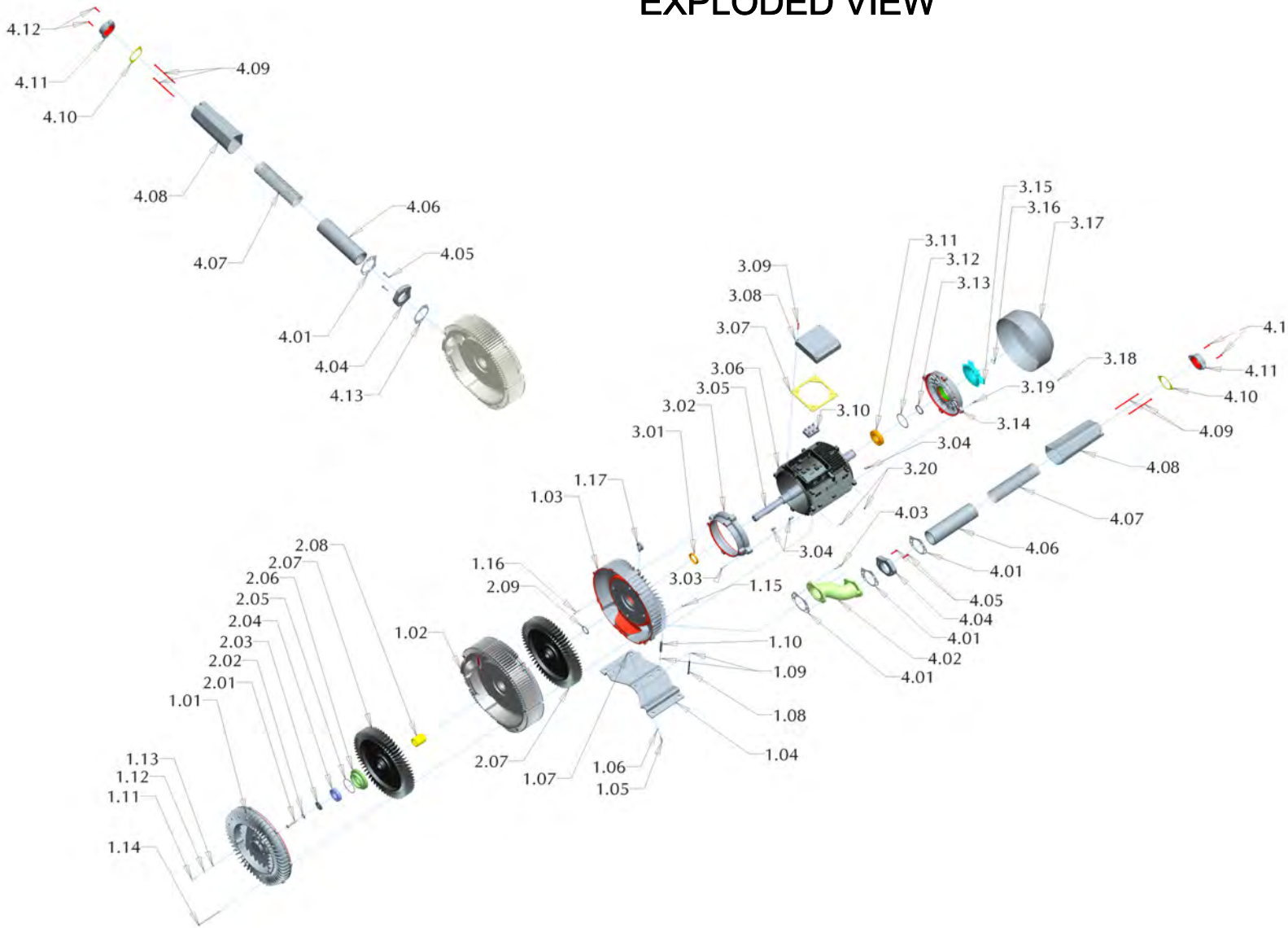
Airtech, Inc.,
150 South Van Brunt Street
Englewood, NJ, 07631
Phone: 1-201-569-1173
Fax: 201-569-1696.

3BA1 SINGLE STAGE EXPLODED VIEW



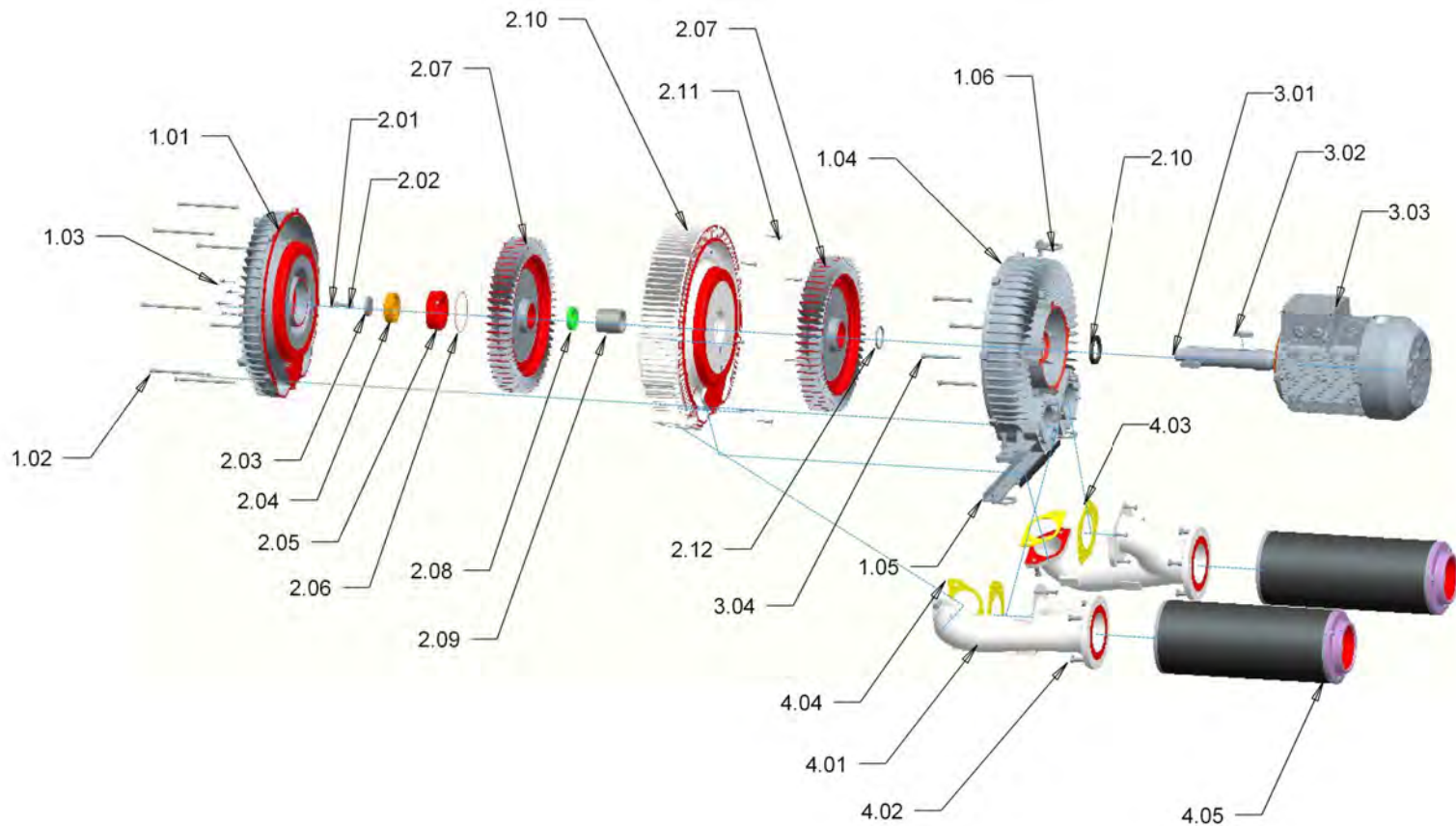
No.	Qty.	Description
1.01	1	Cover
1.02	1	Housing
1.03	1	Mounting Plate
1.04	4	Motor Mounting Screw
1.05	2	Mouting Plate Screw
1.06	2	Mounting Plate Washer
1.07	2	Mouting Plate Nut
1.08	1	Stator Support Screw
1.09	2	Stator Support Washer
1.10	1	Stator Support Sleeve
1.11	8	Cover Mounting Screw
1.12	8	Cover Mounting Nut
1.13	4	Bearing Cover Washer
1.14	4	Bearing Cover Screw
2.01	1	Shaft Screw
2.02	1	Shaft Lock Washer
2.03	1	Disc
2.04	1	Bearing
2.05	1	Bearing Cover O-Ring
2.06	1	Bearing Cover
2.07	1	Impeller
2.08	1	Disc
3.01	1	Seal
3.02	1	Motor Rotor
3.03	1	Stator
3.04	1	Terminal Block
3.05	1	Motor Terminal Box Gasket
3.06	1	Cover For Terminal Box
3.07	4	Terminal Box Cover Screw
3.08	1	Rear Bearing
3.09	1	Bearing Preloading Ring
3.10	1	End Shield
3.11	1	Tolerance Ring
3.12	1	Shaft Key
3.13	1	External Fan
3.14	1	Retaining Ring
3.15	1	Fan Cowl
3.16	4	Fan Cowl Screw
3.17	8	Stator Nut
3.18	4	End Shield Screw
3.19	1	Parallel Key
4.01	2	Silencer Gasket
4.02	2	Silencer Insert
4.03	2	Silencer Insert Filler
4.04	2	Silencer Casing
4.05	4	Silencer Screw
4.06	2	Flange
4.07	4	Flange Screw

3BA1 TWO STAGE EXPLODED VIEW



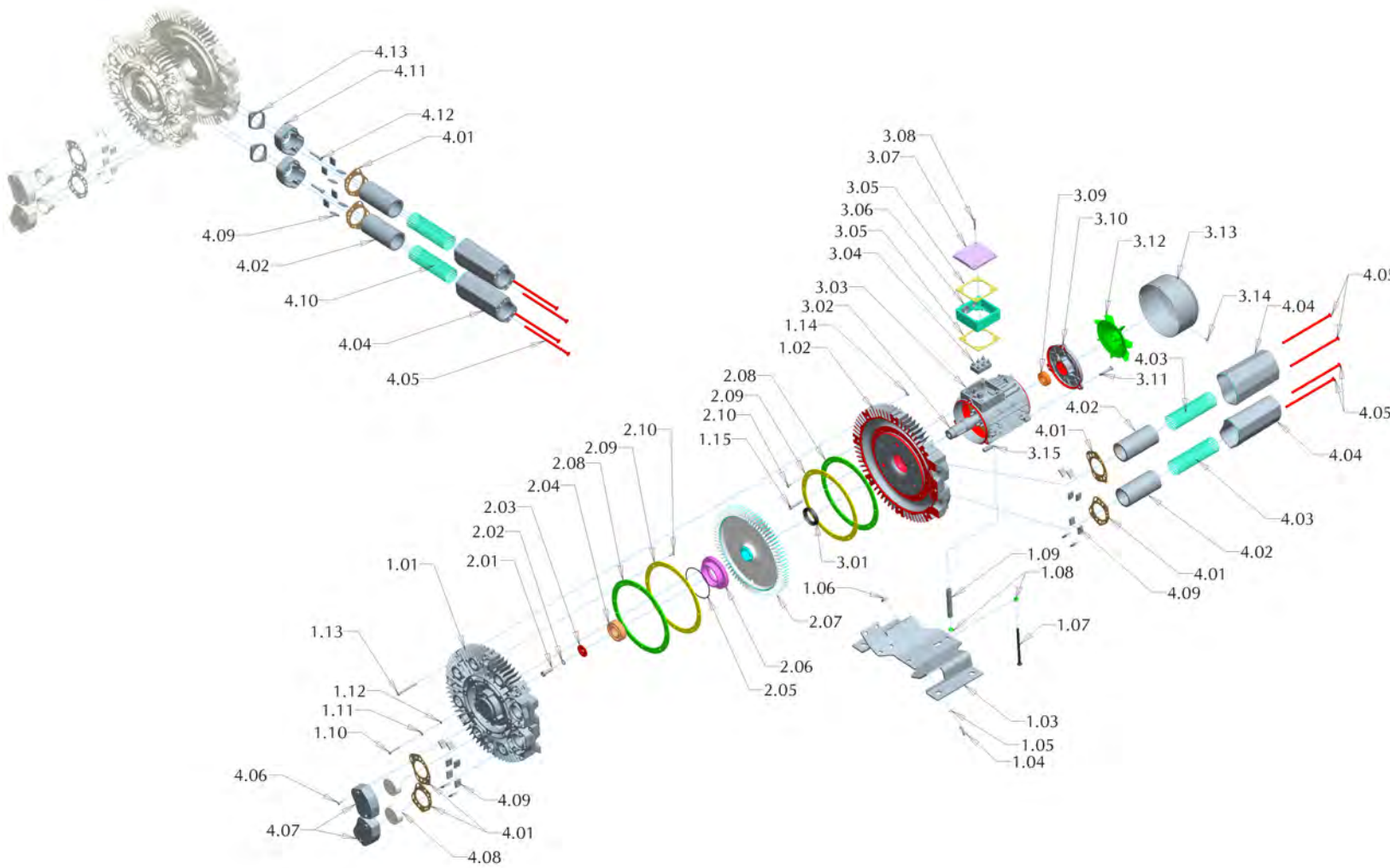
No.	Qty.	Description
1.01	1	Cover
1.02	1	Center Section
1.03	1	Blower Housing
1.04	1	Mounting Plate
1.05	2	Plate Mounting Screw
1.06	2	Mounting Plate Washer
1.07	2	Mounting Plate Nut
1.08	1	Stator Support Screw
1.09	2	Stator Support Washer
1.10	1	Stator Support Sleeve
1.11	4	Bearing Cover Screw
1.12	4	Bearing Screw Washer
1.13	4	Bearing Ring Seal
1.14	8	Cover Mounting Screw
1.15	8	Cover Mounting Nut
1.16	4	Motor Mounting Screw
1.17	1	Lifting Ring
2.01	1	Shaft Screw
2.02	1	Shaft Lock Washer
2.03	1	Disc
2.04	1	Bearing
2.05	1	Bearing Cover O-Ring
2.06	1	Bearing Cover
2.07	2	Impeller
2.08	1	Sleeve
2.09	1	Disc
3.01	1	Shaft Seal Ring
3.02	1	Motor Attachment
3.03	4	Motor Attachment Screw
3.04	3	Parallel Key
3.05	1	Motor Rotor
3.06	1	Stator
3.07	1	Motor Terminal Box Gasket
3.08	1	Cover For Terminal Box
3.09	4	Terminal Box Cover Screw
3.10	1	Terminal Block
3.11	1	Rear Bearing
3.12	1	End Shield Seal
3.13	1	Rotary Shaft Lip Seal
3.14	1	End Shield
3.15	1	External Fan
3.16	1	Retaining Ring
3.17	1	Fan Cowl
3.18	4	Fan Cowl Screw
3.19	4	End Shield Screw
3.20	8	Stator Nut
4.01	4	Silencer Gasket
4.02	1	Silencer Attachment
4.03	2	Silencer Attachment Screw
4.04	2	Silencer Flange
4.05	4	Silencer Flange Screw
4.06	2	Silencer Insert Filler
4.07	2	Silencer Insert
4.08	2	Silencer Casing
4.09	4	Silencer Screw
4.10	2	Flange Gasket
4.11	2	Flange
4.12	4	Flange Screw
4.13	1	Side Silencer Gasket

3BA1943 TWO STAGE EXPLODED VIEW



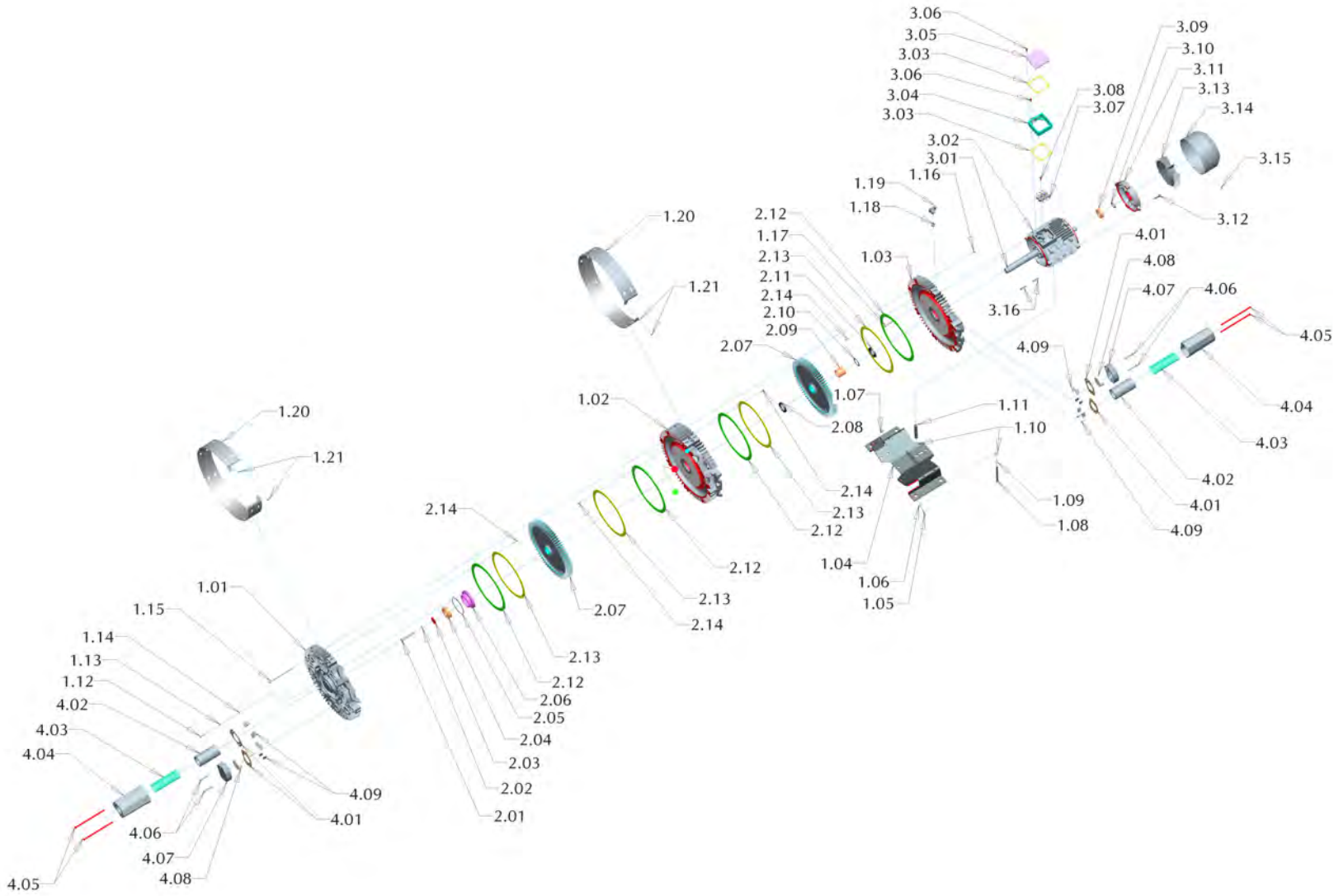
No.	Qty.	Description
1.01	1	Front Housing
1.02	7	Cover Mounting Screw
1.03	4	Bearing Cover Screw
1.04	1	Rear Housing
1.05	1	Lifting Bar
1.06	1	Lifting holder
2.01	1	Shaft Screw
2.02	1	Shaft Lock Washer
2.03	1	Disc
2.04	1	Bearing
2.05	1	Bearing Housing
2.06	1	Bearing Cover O-Ring
2.07	2	Impeller
2.08	1	Rotary Shaft Seal
2.09	1	Sleeve
2.10	1	Center Casing
2.11	7	Center Casing Cover Screw
2.12	1	Sealing Ring
3.01	1	Shaft
3.02	1	Shaft Key
3.03	1	Motor
3.04	4	Motor Screw
4.01	2	Elbow Pipe
4.02	20	Elbow Pipe Screw
4.03	2	Gasket
4.04	2	Gasket
4.05	1	Silencer Housing

3BA7 SINGLE STAGE EXPLODED VIEW



No.	Qty.	Description
1.01	1	Cover
1.02	1	Housing
1.03	1	Mounting Plate
1.04	4	Plate Mounting Screw
1.05	4	Mounting Plate Washer
1.06	4	Mounting Plate Nut
1.07	1	Stator Support Screw
1.08	2	Stator Support Washer
1.09	1	Stator Support Sleeve
1.10	3	Bearing Cover Screw
1.11	3	Bearing Screw Washer
1.12	3	Bearing Ring Seal
1.13	8	Cover Mounting Screw
1.14	8	Cover Mounting Nut
1.15	3	Motor Mounting Screw
2.01	1	Shaft Screw
2.02	1	Shaft Lock Washer
2.03	1	Disc
2.04	1	Bearing
2.05	1	Bearing Cover O-Ring
2.06	1	Bearing Cover
2.07	1	Impeller
2.08	2	Teflon Seal
2.09	2	Retaining Ring
2.10	16	Inner Seal Screw
3.01	1	Shaft Seal Ring
3.02	1	Motor Rotor
3.03	1	Stator
3.04	1	Terminal Block
3.05	2	Motor Terminal Box Gasket
3.06	1	Terminal Box
3.07	1	Cover For Terminal Box
3.08	4	Terminal Box Cover Screw
3.09	1	Rear Bearing
3.10	1	End Shield
3.11	3	End Shield Screw
3.12	1	External Fan
3.13	1	Fan Cowling
3.14	4	Fan Cowling Screw
3.15	1	Parallel Key
4.01	4	Silencer Gasket
4.02	2	Silencer Insert Filler
4.03	2	Silencer Insert
4.04	2	Silencer Casing
4.05	4	Silencer Screw
4.06	4	Flange Screw
4.07	2	Flange Cap
4.08	2	Flange Filler
4.09	16	Filler
4.10	2	Silencer Insert
4.11	2	Flange
4.12	4	Flange Screw
4.13	2	Flange Gasket

3BA7 TWO STAGE EXPLODED VIEW



No.	Qty.	Description
1.01	1	Cover
1.02	1	Center Section
1.03	1	Housing
1.04	1	Mounting Plate
1.05	4	Plate Mounting Screw
1.06	4	Mounting Plate Washer
1.07	4	Mounting Plate Nut
1.08	1	Stator Support Screw
1.09	1	Stator Support Lock Washer
1.10	2	Stator Support Washer
1.11	1	Stator Support Sleeve
1.12	3	Bearing Cover Screw
1.13	3	Bearing Screw Washer
1.14	3	Bearing Ring Seal
1.15	8	Cover Mounting Screw
1.16	8	Cover Mounting Nut
1.17	4	Motor Mounting Screw
1.18	1	Lifting Ring Nut
1.19	1	Lifting Ring
1.20	2	Blower Cowl
1.21	4	Blower Cowl Screw
2.01	1	Shaft Screw
2.02	1	Shaft Lock Washer
2.03	1	Disc
2.04	1	Bearing
2.05	1	Bearing Cover O-Ring
2.06	1	Bearing Cover
2.07	2	Impeller
2.08	1	Rotary Shaft Seal
2.09	1	Sleeve
2.10	1	Disk
2.11	1	Shaft Seal Ring
2.12	4	Teflon Seal
2.13	4	Retaining Ring
2.14	32	Inner Seal Screw
3.01	1	Motor Rotor
3.02	1	Stator
3.03	2	Motor Terminal Box Gasket
3.04	1	Terminal Box
3.05	1	Cover For Terminal Box
3.06	8	Terminal Box Screw
3.07	1	Terminal Block
3.08	1	Terminal Block Screw
3.09	1	Rear Bearing
3.10	1	End Shield Disk
3.11	1	End Shield
3.12	4	End Shield Screw
3.13	1	External Fan
3.14	1	Fan Cowl
3.15	4	Fan Cowl Screw
3.16	2	Parallel Key
4.01	4	Silencer Gasket
4.02	2	Silencer Insert Filler
4.03	2	Silencer Insert
4.04	2	Silencer Casing
4.05	4	Silencer Screw
4.06	4	Flange Screw
4.07	2	Flange Cap
4.08	2	Flange Filler
4.09	16	Filler

Airtech, Inc. (“Company”) Warranty Statement

Company warrants that on the date of shipment to Purchaser the goods will be of the kind and quality described herein, merchantable, and free of all defects in workmanship and materials.

If within one year from the date of initial operation, but not more than eighteen months from date of shipment by the Company, of any item of the goods, Purchaser discovers that such item was not as warranted above and promptly notifies Company in writing thereof, Company shall remedy such defect by, at the Company’s option, adjustment, repair or replacement of the item and any affected part of the good. Purchaser shall assume all responsibility and expense for removal, reinstallation and freight in connection with the foregoing remedy. The same obligations and conditions shall extend to replacement items furnished by the Company hereunder. Company shall have the right of disposal of items replaced by it. Purchaser shall grant Company access to the goods at all reasonable times in order for Company to determine any defect in the goods. In the event that adjustment, repair or replacement does not remedy the defect, the Company and Purchaser shall negotiate in good faith an equitable adjustment in the contract price.

The Company’s responsibility does not extend to any item of the goods which has not been manufactured and sold by the Company. Such item shall be covered only by the express warranty, if any, by the manufacturer thereof. The Company and its suppliers shall also have no responsibility if the goods have been improperly stored, handled or installed, or if the goods have not been operated or maintained according to their ratings or according to the instructions in Company or supplier furnished manuals, or if unauthorized repairs or modifications have been made to the goods.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES (EXCEPT TITLE) INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS, AND CONSTITUTES THE ONLY WARRANTY OF COMPANY WITH RESPECT TO THE GOODS.

The forgoing states Purchaser’s exclusive remedy against Company and its suppliers for any defect in the good or for failure of the goods to be as warranted, whether Purchaser’s remedy is based on contract, warranty, failure of such remedy to achieve its essential purpose, tort (including negligence), strict liability, indemnity, or any other legal theory, and whether arising out of warranties, representations, instructions, installations, or defects from any cause.

Neither Company nor its suppliers shall be liable, whether in contract, warranty, failure of a remedy to meet its essential purpose, tort (including negligence), strict liability, indemnity or any other legal theory, for loss of use, revenue or profit or for cost of capital or of substitute use or performance or for indirect, liquidated, incidental or consequential damages or for any other loss or cost of a similar type, or for claims by Purchaser for damages of Purchaser’s customers.

AIRTECH[®]
VACUUM

150 South Van Brunt St.
Englewood, NJ 07631
Tel: 1-888-222-9940
Fax: 201-569-1696
airtech@airtechusa.com

AIRTECH[®] SOUTH
VACUUM

2211 Newmarket Parkway
Marietta, GA 30067
Tel: 770-690-0700
Fax: 770-690-0709
airtechsouth@airtechusa.com

AIRTECH[®] WEST
VACUUM

42 Digital Drive #9
Novato, CA 94949
Tel: 415-382-9000
Fax: 415-382-9700
airtechwest@airtechusa.com

AIRTECH[®]
CHINA

2nd Building,
Jiangbian Second Industrial Park
Songgang Town, Bao'an District
Shenzhen, China
Tel: +86-755-81730991(Ext.8018)
Fax: +86-755-81730986
www.airtechchina.com



7 / 9 Sainsbury Road
O'Connor 6163
Australia
Tel: +61 8 9331 4890
Fax: +61 8 9331 4813
www.vacuvane.com.au

AIRTECH[®]
EUROPE

Vacuvane
Vacuum Technology GMBH
Amsterdamstraße 16
D-97424 Schweinfurt,
Germany
Tel: +49 (0)9721 94563-0
Fax: +49 (0)9721 94563-29
www.vacuvane.com

AIRTECH[®]
EUROPE

HPE
Pressure & Vacuum Technology
C. dels Amics d'Argentona, 40
08310 Argentona (Barcelona)
Spain
Tel: (+34) 93 797 17 66
Fax: (+34) 93 797 17 54
www.hpe-technology.com



**AIRTECH CENTRAL SYSTEM
STARTUP CHECKLIST/SIGN-OFF SHEET**

Date: _____ **Customer:** _____
Project/Airtech Job#: _____
System Model/Type: _____
Serial Number: _____

VERIFY THE FOLLOWING:

I. Installation

- A) Location
 - 1) Adequate room for servicing
 - 2) Adequate room for cooling
- B) Piping
 - 1) Adequate sizing
 - 2) Hangers/support
 - 3) Free of liquid/debris
 - 4) Exhaust line provided with rain cap or gooseneck
- C) Electrical (ph / Hz / Volts)

II. Service and Operation

- A) Check relief valve location (clean; dry)
- B) Jog pump on/off to insure correct rotation
- C) Run system with inlet isolation valve partially open (4-5"Hg vacuum)
- D) Check for unusual noise or vibration
- E) Place on line (valves open)
- F) Remote alarm panel installed and connected/functioning

System installation and function is satisfactory _____

Notes:

Checked by: _____ Date _____

Approved by: _____ Date _____



APPENDIX H
Site Management Forms

COMPOSITE COVER SYSTEM INSPECTION CHECKLIST

Site Name: _____ Location: _____ Project Number: _____

Inspector Name: _____ Date: _____ Weather Conditions: _____

Reason for Inspection _____

Check one of the following: **Y:** Yes **N:** No **NA:** Not Applicable

		Y	N	NA	Normal Situation	Remarks
	General					
1	What are the current site conditions?					
	Site Cover System					
2	Are there any indications of a breach in the site cover system at the time of this inspection?					
3	Is there any construction activity, or indication of any construction activity within the past certification year (including any tenant improvements), that included the breaching of the site cover system, on-site at the time of this inspection?					
4	If YES to number 3, is there documentation that the Soil Management Plan, HASP, and CAMP for the site was/is being followed? Any breach of the cover system into residual contaminated material (or the SMDS) should be overseen by the remedial engineer, and documented and reported in the periodic review report.					

If the answer to any of the above questions indicate non-compliance with ECs for the site, additional remarks must be provided and, where applicable, documentation attached to this checklist detailing additional inspection and repair activities.

Additional remarks: _____

Minimum Inspection Schedule: Site-wide inspections will be conducted annually, per certification year, at a minimum. Additional inspections will also be conducted at times of severe condition events. All inspection events will utilize this checklist.

SITE WIDE INSPECTION CHECKLIST

Site Name: _____ Location: _____ Project Number: _____

Inspector Name: _____ Date: _____ Weather Conditions: _____

Reason for Inspection (i.e., routine, severe condition, etc.): _____ Annual Inspection _____

Check one of the following: **Y**: Yes **N**: No **NA**: Not Applicable

	Y	N	NA	Normal Situation	Remarks
General					
1	--	--	--	--	
2					Are all applicable site records (e.g., documentation of construction activity, most current deed restriction, etc.) complete and up to date?
Deed Restriction					
3					Has site use (restricted residential) remained the same?
4					Does it appear that all deed restriction stipulations have been followed?
Impermeable Site Cover					
5					Are there any indications of a breach in the cover system at the time of this inspection?
6					Are there any cracks in the building slabs?
7					Are there any cracks in the building walls?
8					Is there any construction activity, or indication of any construction activity within the past certification year (including any tenant improvements), that included the breaching of the cover system, on-site at the time of this inspection?
9					If YES to number 8, is there documentation that the Soil Management Plan, HASP, and CAMP for the site was/is being followed?

*** If the answer to any of the above questions indicate non-compliance with any IC/ECs for the site, additional remarks must be provided and, where applicable, documentation attached to this checklist detailing additional inspection and repair activities.

Additional remarks _____

Minimum Inspection Schedule: Site-wide inspections will be conducted annually, per certification year, at a minimum. Additional inspections will also be conducted at times of severe condition events. All inspection events will utilize this checklist.

SMD SYSTEM INSPECTION CHECKLIST

Site Name: _____ Location: _____ Project Number: _____

Inspector Name: _____ Date: _____ Weather Conditions: _____

Reason for Inspection (i.e., routine, maintenance, severe condition, etc.): _____

SMD and/or Building Number: _____

Check one of the following: **Y:** Yes **N:** No **NA:** Not Applicable

		Y	N	NA	Normal Situation	Remarks
	Records					
1	Is the Operations & Maintenance Plan readily available on-site?					
2	Based on site records, when was the last inspection, maintenance, or repair event?					
3	Based on site records, was the system inoperational for any amount of time since the last inspection, maintenance, or repair event? For how long? Provide details.					
	Alarm System					
4	Do the alarm lights indicate that the system is operational?					
	General System					
5	Is there any construction activity, or indication of any construction activity within the past certification year (including any tenant improvements), that included the breaching of the floor slab, on-site at the time of this inspection?					
6	If YES to number 5, is there documentation that the Soil Management Plan, HASP, and CAMP for the site was/is being followed?					
7	If YES to number 5, is there documentation that all breaches in the floor slab have been sealed?					
8	Does all visible SMD piping appear intact and undamaged?					
9	Have any intake points been constructed at the roof near (less than 10 feet) the SMD blower discharge point?					

SMD SYSTEM INSPECTION CHECKLIST

Site Name: _____ Location: _____ Project Number: _____

Inspector Name: _____ Date: _____ Weather Conditions: _____

Reason for Inspection (i.e., routine, maintenance, severe condition, etc.): _____

SMD and/or Building Number: _____

Check one of the following: **Y**: Yes **N**: No **NA**: Not Applicable

		Y	N	NA	Normal Situation	Remarks
SMD Blower Unit						
10	Is the SMD blower operational at the time of the inspection?					
11	What is the VelociCalc Meter reading?					
12	Is the SMD blower expelling air at the discharge point?					
Routine Blower Maintenance						
13	Remove dust and debris from surface of blower.					
14	Replace dirty or clogged filter cartridge.					

**** If the answer to any of the above questions indicate the SMD system is non-operational or malfunctioning, or that this EC is in non-compliance, additional remarks must be provided and, where applicable, documentation attached to this checklist detailing additional inspection and repair activities.**

Additional remarks: _____

Minimum Inspection Schedule: SMD inspections will be conducted quarterly for the first certification year at a minimum. Additional inspections will also be conducted at times of maintenance, repair, or severe condition events. Inspections will be conducted annually, at a minimum, following the first certification year. Inspection frequency is subject to change with the approval of NYSDEC. All inspection events will utilize this checklist.

SITE INSPECTION CHECKLIST

Site Inspection Checklist - Cover System
Gerry Street
Brooklyn, NY
Lot 52

Date: _____ Time: _____

Inspector Name/Organization: _____

Visual Inspection of Asphalt Capped Site

Inspect for cracks, perforations and patching

Describe General Condition of Pavement _____

Describe any Cracks or New Penetrations _____

Describe any Patching _____

Repairs Needed and / or Maintenance at this time?

Signature: _____ Date: _____