

264-12 HILLSIDE AVENUE  
QUEENS, NEW YORK 11040

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# Remedial Action Work Plan

NYC VCP Project Number 16CVCP063Q  
OER Project Number 15EH-N558Q

**Prepared For:**  
Shiv Shakti Peeth  
196-43 Foothill Avenue  
**Hollis, New York 11423**

**Prepared By:**

***EBC***

***ENVIRONMENTAL BUSINESS CONSULTANTS***

1808 Middle Country Road  
**Ridge, NY 11961**

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## LIST OF ACRONYMS

<b>Acronym</b>	<b>Definition</b>
AOC	Area of Concern
AS/SVE	Air Sparging/Soil Vapor Extraction
BOA	Brownfield Opportunity Area
CAMP	Community Air Monitoring Plan
C&D	Construction and Demolition
CEQR	City Environmental Quality Review
CFR	Code of Federal Regulations
CHASP	Construction Health and Safety Plan
COC	Certificate of Completion
CQAP	Construction Quality Assurance Plan
CSOP	Contractors Site Operation Plan
DCR	Declaration of Covenants and Restrictions
ECs/ICs	Engineering Controls and Institutional Controls
ELAP	Environmental Laboratory Accreditation Program
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations Emergency Response
IRM	Interim Remedial Measure
BCA	Brownfield Cleanup Agreement
MNA	Monitored Natural Attenuation
NOC	Notice of Completion
NYS DEC	New York State Department of Environmental Conservation
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York State Department of Health and Mental Hygiene
NYC OER	New York City Office of Environmental Remediation
NYC VCP	New York City Voluntary Cleanup Program
NYCRR	New York Codes Rules and Regulations
NYS DEC	New York State Department of Environmental Conservation

NYS DEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYS DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
ORC	Oxygen-Release Compound
OSHA	United States Occupational Health and Safety Administration
PCBs	Professional Engineer Polychlorinated Biphenyls
PE	Professional Engineer
PID	Photo Ionization Detector
QEP	Qualified Environmental Professional
QHHEA	Qualitative Human Health Exposure Assessment
RAOs	Remedial Action Objectives
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan or Plan
RCA	Recycled Concrete Aggregate
RD	Remedial Design
RI	Remedial Investigation
RMZ	Residual Management Zone
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SSDS	Sub-Slab Depressurization System
SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
TCL	Target Compound List
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound



## CERTIFICATION

I, [name], am currently a registered professional engineer licensed by the State of New York. I performed professional engineering services and had primary direct responsibility for designing the remedial program for the 264-12 Hillside Avenue site, site number 16CVCP063Q. I certify to the following:

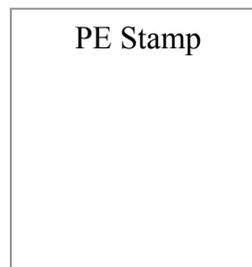
- I have reviewed this document, to which my signature and seal are affixed.
- Engineering Controls developed for this remedial action were designed by me or a person under my direct supervision and achieve to achieve the goals established in this Remedial Action Work Plan for this site.
- The Engineering Controls to be constructed during this remedial action are accurately reflected in the text and drawings of the Remedial Action Work Plan and are of sufficient detail to enable proper construction.
- This Remedial Action Work Plan (RAWP) has a plan for handling, transport and disposal of soil, fill, fluids and other materials removed from the property in accordance with applicable City, State and Federal laws and regulations. Importation of all soil, fill and other material from off-Site will be in accordance with all applicable City, State and Federal laws and requirements. This RAWP has provisions to control nuisances during the remediation and all invasive work, including dust and odor suppression.

\_\_\_\_\_  
Name

\_\_\_\_\_  
PE License Number

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date



I, [name], am a qualified Environmental Professional. I had primary direct responsibility for implementation remedial program for the [site name (address)] site, site number [VCP site number]. I certify to the following:

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

\_\_\_\_\_  
QEP Name

\_\_\_\_\_  
QEP Signature

\_\_\_\_\_  
Date

## **EXECUTIVE SUMMARY**

Shiv Shakti Peeth is working with the NYC Office of Environmental Remediation (OER) in the New York City Voluntary Cleanup Program to investigate and remediate a 10,000-square foot site located at 264-12 Hillside Avenue in Queens, New York. A remedial investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP). The remedial action described in this document provides for the protection of public health and the environment consistent with the intended property use, complies with applicable environmental standards, criteria and guidance and conforms with applicable laws and regulations.

### **Site Location and Background**

The Site is located at 264-12 Hillside Avenue in the Hillside Section of the Borough of Queens, New York, and is currently identified as Block 8794 and Lot 22 on the New York City Tax Map. Figure 1 shows the Site location. The lot is square shaped and approximately 10,000 square feet (sf) in total with 100 feet of street frontage along Hillside Avenue and 100 feet of street frontage on 265<sup>th</sup> Street. A map of the site boundary is shown on Figure 2. Currently, Lot 22 is vacant.

### **Summary of Redevelopment Plan**

The proposed future use of the Site will consist of a new 2-story temple with a full cellar. The 5,550 square foot (sf) first floor will contain a 3,585 sf prayer hall, a 260 sf store, an elevator lobby, a vestibule, two storage rooms, a shoe rack room, an office, a bathroom, an elevator, and a stairwell. The 2,511 sf second floor will consist of 3 private priests' studies, storage, a bathroom, mechanical room, elevator and stairwell, as well as the care takers apartment. The cellar will be 5,550 sf in size and will contain a 2,812 sf dining hall, a kitchen, a walk in cooler, two bathrooms, two storage closets, a mechanical room, a utility closet, a stairwell and an elevator.

The cellar level will require excavation to a total depth of approximately 13 feet below grade and is approximately a 74 feet by 75 feet area. The remaining areas will not be excavated and will be paved or landscaped. The elevator shaft will be excavated an additional 5 feet below grade. Approximately 2,672 cubic yards (cy) (4,000 tons) of soil will be excavated for the cellar. The water table is approximately 66-67 feet below grade surface (bgs) and therefore, will not be encountered during excavation.

Layout of the redevelopment plans for the cellar is presented in Figure 3. The current zoning designation is R2-3 with a C1-3 commercial overlay. The remedial action contemplated under this RAWP may be implemented independently of the proposed redevelopment plan.

### Summary of Surrounding Property

The area immediately surrounding Site consists of residential buildings to the north (across Hillside Avenue), west and south; and an industrial building to the east (across 265th Street). Figure 4 shows the surrounding land usage of the adjacent properties listed below as well as additional properties located up to 500 feet away from the Site. No schools, daycare facilities, or hospitals were identified within a 500 ft radius of the Site.

#### Surrounding Property Usage

Direction	Property Description
<b>North</b> – <i>Across Hillside Avenue</i>	<u>Block 8776, Lot 98</u> – 83-60 265 Street: a 2,000 sf residential lot developed with a multi-family walk up.
<b>South</b> – <i>Adjacent property</i>	<u>Block 8794, Lot 27</u> – 84-12 265 Street. One 4,000 sf lots developed with a 1 and 2 family residential dwelling.
<b>East</b> – <i>Across 265th Street</i>	<u>Block 8795, Lot 14</u> - 265-08 Hillside Avenue: A 10,000 sf property developed with an industrial/manufacturing building.
<b>West</b> – <i>Adjacent property</i>	<u>Block 8794, Lots 15, 16, 18 and 20</u> - 84-01 to 84-07 264 Street: A 2,225 sf lot developed with a mixed residential and commercial use building, a 2,242 sf lot developed with a residential multi-family walk up, and two 2,742 sf lots each developed with a residential multi-family walk up.

## **Summary of Past Site Uses and Areas of Concern**

According to historical sources, the Site was occupied as a gasoline service station and automobile repair facility as early as 1966. Gasoline service operations continued onsite until approximately 1991, when the property was solely occupied by an automobile repair facility. According to the regulatory agency records, the regulatory database, and prior reports, the subject property was formerly equipped with a total of twelve (12) gasoline underground storage tanks (USTs) all totaling 550-gallons in size and located in the central eastern portion of the property in a tank field. The Site is currently vacant and is equipped with one (1) 550-gallon waste oil underground storage tank (UST) and one (1) 550-gallon heating oil UST.

- A Gasoline Tanks Excavation Report, prepared by Phoenix Environmental Technologies, Inc. (PET) (dated August 22, 2003) detailed the removal of all twelve gasoline USTs, as well as associated underground piping and pump islands. Soils located immediately outside the concrete encasement and beneath the dispenser islands were screened using a Photo Ionization Detector (PID) which recorded readings ranging from 0.0 to 15 parts per million (ppm). Groundwater was not encountered during excavation activities. Following excavation and field screening activities, a total of five (5) soil samples were collected for analysis. All five (5) soil samples were for volatile organic compounds (VOCs) analysis via EPA Method 8021. Reportedly, only one sample, TF-South, was found to contain VOC contamination. The only compound detected was methyl tertiary butyl ether (MTBE) at a concentration of 19 µg/kg; which is below its respective standard.
- A second Subsurface Investigation Report, prepared by EMS, dated June 14, 2011 included the advancement of six (6) borings in the area of the former tank field and dispenser islands on the subject property. Soil samples were submitted for analysis of the STARS List VOCs including benzene, toluene, ethylbenzene, xylenes, and MTBE, using Method SW-846-8260. No VOCs concentrations in excess of recommended NYS TAGM Recommended Soil Cleanup Objectives (RSCOs) were reported in any of the soil samples collected from the borings located within the former tank field.

In May 2014, an AEI consultants conducted a Limited Phase II Subsurface Investigation, which included a geophysical survey. The purpose of the geophysical survey was to outline the current USTs and provide utility clearance. A total of six (6) soil borings (AEI-B1 through AEI-B6) were advanced on the Site. The borings were advanced using a direct-push drilling method. Each boring was advanced to a depth of 20 feet bgs. No elevated PID readings were reported, and no odors or staining were observed in any of the soil columns. Due to the lack of contaminants detected above the NYSDEC Unrestricted SCOs, the NYSDEC CP-51 Unrestricted Residential SCOs, and the NYSDEC CP-51 Commercial SCOs, it does not appear that a reportable release has occurred in the areas evaluated.

Areas of Concern (AOCs) identified for the Site include:

1. The presence of historic fill material to depths as great as 2 feet.
2. The Site was occupied as a gasoline service station and automobile repair facility as early as 1966. Gasoline service operations continued onsite until approximately 1991. Thereafter the site was occupied as an auto repair facility.
3. The Site was most recently developed as an automobile repair facility and is equipped with one (1) 550-gallon waste oil underground storage tank (UST) and one (1) 550-gallon heating oil UST.

### **Summary of Work Performed under the Remedial Investigation**

EBC performed the following scope of work at the Site in September and December of 2015:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed seven soil borings across the Site, and collected fourteen soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed three groundwater monitoring wells throughout the Site and collected three groundwater samples and one duplicate groundwater sample for chemical analysis to evaluate groundwater quality;
4. Installed five soil gas implants and collected five soil gas samples for chemical analysis.

### **Summary of Findings of Remedial Investigation**

1. The elevation of the Site is approximately 109 feet above sea level.
2. Depth to groundwater is estimated to be approximately 66-67 feet below sidewalk grade.
3. Groundwater flow is generally southwest.
4. Depth to bedrock at the Site is greater than 100 feet.
5. The stratigraphy of the Site from the surface down consists of historic fill material to depths as great as 2 feet, underlain by native brown silty, sand and clay.
6. Soil/fill samples results were compared to the New York State Department of Environmental Conservation (NYSDEC) 6NYCRR Part 375 Section 6.8 Track 1 Unrestricted Use as well as to Track 2 Restricted Residential Use Soil Cleanup Objectives (SCOs). No PCBs were detected in any of the samples, and no VOCs or SVOCs were detected above Unrestricted Use SCOs. Two pesticides, alpha-chlordane (max. of 9,200 µg/kg) and chlordane (max. of 94,000 µg/kg), were detected above Restricted Residential SCOs in the shallow soil samples. Several metals including arsenic (max. of 16 mg/kg), copper (max. of 105 mg/kg), lead (max. of 99.2 mg/kg) and mercury (max. of 0.54 mg/kg) exceeded Unrestricted Use SCOs within all shallow soil samples. Of these metals, arsenic also exceeded its Restricted Residential Use SCOs in one of the shallow soil samples. Overall, the soil results were consistent with data identified at sites with urban fill material in NYC with the exception of the chlordane identified above Restricted Residential SCOs which will be treated as a hotspot.
7. Groundwater samples results were compared to New York State 6NYCRR Part 703.5 Class GA Groundwater Quality Standards (GQS). Groundwater samples collected during the investigations showed no pesticides at detectable concentrations. Several VOCs were detected with 1,1,1-trichloroethane (max. of 8 µg/L) 1,1,2-trichloroethane (4.5 µg/L), 1,1-dichloroethane (34 µg/L), 1,2-dichloroethane (10 µg/L), 1,2-dichloropropane (13 µg/L), 2,2-dichloropropane (14 µg/L), bromomethane (max of 25 µg/L), carbon tetrachloride (max of 19 µg/L), chloroethane (max of 24 µg/L), chloroform (max of 6,600 µg/L), chloromethane (max of 270 µg/L), acetone (max 120 µg/L), and methylene chloride (max. of 85 µg/L) exceeding their respective GQS. One SVOC, benzoic acid (max. of 240 µg/L) was detected in trace concentrations. One PCB, PCB-1016 (max. of 0.061 µg/L) was detected above GQS in one of the three samples and within the duplicate. Several metals were identified in groundwater, but only antimony (max. of

0.006 mg/L), chromium (max. of 0.74 mg/L), iron (max. of 0.58 mg/L), and sodium (max. of 1,210 mg/L) exceeded their respective GQS in all three groundwater samples and the duplicate.

8. Soil vapor samples collected during the RI were compared to the compounds listed in the NYSDOH located in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion dated October 2006 matrices. Soil vapor samples collected during the RI showed high levels of petroleum-related VOCs and chlorinated VOCs. The total concentration of petroleum-related VOCs (BTEX) ranged from 1,798.9  $\mu\text{g}/\text{m}^3$  to 5,254.3  $\mu\text{g}/\text{m}^3$ . The chlorinated VOC, trichloroethylene (TCE) was detected in two of the soil gas samples ranging in concentrations from 0.27  $\mu\text{g}/\text{m}^3$  to 1.5  $\mu\text{g}/\text{m}^3$ . Tetrachloroethylene (PCE) was detected in all soil gas samples ranging in concentration from 24.1  $\mu\text{g}/\text{m}^3$  to 416  $\mu\text{g}/\text{m}^3$ . Carbon tetrachloride (at 0.28  $\mu\text{g}/\text{m}^3$ ) was detected in one of the soil gas samples. 1,1,1-trichloroethane (TCA) with a maximum concentration of 4.51  $\mu\text{g}/\text{m}^3$  was detected in one of the soil vapor sample. Concentrations of chlorinated VOC PCE were above the monitoring level ranges established within the NYSDOH soil vapor guidance matrix.

## **Summary of the Remedial Action**

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

The major milestones for the Remedial Action were: A Pre-Application Meeting was held on June 24, 2015. A Remedial Investigation (RI) was performed in September and December, 2015 and a RI Report was prepared to evaluate data and information necessary to develop a Remedial Action Work Plan (RAWP).

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establishment of Track 2 Restricted Residential Soil Cleanup Objectives (SCOs) and groundwater protection SCOs for alpha and gamma chlordane. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility(s).
6. Excavation and removal of soil/fill exceeding Track 2 Restricted Residential SCOs. A 75 x 74 area (the cellar) will be excavated to a depth of approximately 13 feet below grade for development purposes. In addition the area of the elevator pit will be excavated an additional 5 feet. Excavation and removal of all locations where alpha-Chlordane and gamma-Chlordane exceed SCOs .
7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site.
8. Management of excavated materials including temporarily stockpiling and segregating in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials.
9. Removal of the waste oil UST and the heating oil UST. Registration of tanks and reporting of any petroleum spills associated with UST's and appropriate closure of these petroleum spills in compliance with applicable local, State and Federal laws and regulations.
10. Transportation and off-Site disposal of all soil/fill material at licensed or permitted facilities in accordance with applicable laws and regulations for handling, transport,

and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media on-Site.

11. Demarcation of residual soil/fill in landscaped areas.
12. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
13. Construction of an engineered composite cover consisting of a six-inch thick concrete building slab in the cellar area. A six inch concrete slab or two feet of clean soil will be used to cover the unexcavated areas.
14. Installation of a vapor barrier system consisting of vapor barrier beneath the building slab and outside of sub-grade foundation sidewalls. The vapor barrier system will consist of a 20-mil Raven Industries VaporBlock 20+ below the slab throughout the full building area and a 20-mil Raven Industries VaporBlock 20+ outside all sub-grade foundation sidewalls. All welds, seams and penetrations will be properly sealed to prevent preferential pathways for vapor migration. The vapor barrier system is an Engineering Control for the remedial action. The remedial engineer will certify in the RAR that the vapor barrier system was designed and properly installed to mitigate soil vapor migration into the building
15. Installation of an active sub-slab depressurization system (SSDS) consisting of three loops installed beneath the basement slab of the building. The SSDS loops will provide the correct coverage in accordance with USEPA sub-slab depressurization design specifications which recommend a separate vent loop for every 4,000 ft<sup>2</sup> of slab area. The horizontal vent line is to be constructed of a continuous loop of perforated 4-inch HDPE pipe fitted with a filter sock. Fill material around the horizontal vent piping will be ¾ inch gravel with round edges. The horizontal pipe will extend to an adjacent utility chase-way where it will be piped to the roof via a 6-inch schedule 40 Cast Iron line. The exhaust stack will be located a minimum of 10 feet from windows and ventilation inlets and a minimum of 6” above the roof line as per MC512.4 All other applicable provisions of the NYC BC, MC, and PC shall be complied with. The active SSDS will be hardwired and will include a blower installed on the roof line and a pressure gauge and alarm located in an accessible area in the basement. The active sub-slab depressurization system is an Engineering Control for

- the remedial action. The remedial engineer will certify in the RAR that the active sub-slab depressurization system was designed and properly installed to establish a vacuum in the gas permeable layer and a negative (decreasing outward) pressure gradient across the building slab to prevent vapor migration into the building.
16. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
  17. Performance of all activities required for the remedial action, including acquisition of required permits and attainment of pretreatment requirements, in compliance with applicable laws and regulations.
  18. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
  19. Submission of a RAR that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and describes all Engineering and Institutional Controls to be implemented at the Site.
  20. Submission of an approved Site Management Plan (SMP) in the Remedial Action Plan (RAR) for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
  21. The property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

## COMMUNITY PROTECTION STATEMENT

The NYC Office of Environmental Remediation (OER) provides governmental oversight for the cleanup of contaminated property in NYC. This Remedial Action Work Plan (“cleanup plan”) describes the findings of prior environmental studies that show the location of contamination at the site, and describes the plans to clean up the site to protect public health and the environment.

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

### **Project Information:**

- Site Address: 264-12 Hillside Avenue Queens, NY
- NYC Voluntary Cleanup Program Project Number: 16CVCP063Q

### **Project Contacts:**

- OER Project Manager: Noel Anderson, 212-341-2073
- Site Project Manager: Chawinie Reilly, 631-504-6000
- Site Safety Officer: Kevin Waters, 631-504-6000
- Online Document Repository: <http://www.nyc.gov/html/oer/html/document-repository/document-repository.shtml>

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

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

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

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

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

**Worker Training:** Workers participating in cleanup of contaminated material on this project are required to be trained in a 40-hour hazardous waste operators training course and to take annual refresher training. This pertains to workers performing specific tasks including removing contaminated material and installing cleanup systems in contaminated areas.

**Community Air Monitoring Plan:** Community air monitoring will be performed during this cleanup project to ensure that the community is properly protected from contaminants, dust and odors. Air samples will be tested in accordance with a detailed plan called the Community Air Monitoring Plan or CAMP. Results will be regularly reported to the NYC Office of Environmental Remediation. This cleanup plan also has a plan to address any unforeseen problems that might occur during the cleanup (called a ‘Contingency Plan’).

**Odor, Dust and Noise Control:** This cleanup plan includes actions for odor and dust control. These actions are designed to prevent off-Site odor and dust nuisances and includes steps to be taken if nuisances are detected. Generally, dust is managed by application of physical covers and by water sprays. Odors are controlled by limiting the area of open excavations, physical covers, spray foams and by a series of other actions (called operational measures). The project is also required to comply with applicable NYC noise control standards. If you observe problems in these areas, please contact the onsite Project Manager or NYC Office of Environmental Remediation Project Manager listed on the first page of this Community Protection Statement document.

**Quality Assurance:** This cleanup plan requires that evidence be provided to illustrate that all cleanup work required under the plan has been completed properly. This evidence will be summarized in the final report, called the Remedial Action Report. This report will be submitted to the NYC Office of Environmental Remediation and will be thoroughly reviewed.

**Stormwater Management:** To limit the potential for soil erosion and discharge, this cleanup plan has provisions for stormwater management. The main elements of the stormwater management include physical barriers such as tarp covers and erosion fencing, and a program for frequent inspection.

**Hours of Operation:** The hours for operation of cleanup will comply with the NYC Department of Buildings construction code requirements or according to specific variances

issued by that agency. For this cleanup project, the hours of operation will conform to requirements of Department of Buildings.

**Signage:** While the cleanup is in progress, a placard will be prominently posted at the main entrance of the property with a laminated project Fact Sheet that states that the project is in the NYC Voluntary Cleanup Program and provides project contact names and numbers, and locations of project documents can be viewed.

**Complaint Management:** The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager or the NYC Office of Environmental Remediation Project Manager listed on the first page of this Community Protection Statement document, or call 311 and mention the Site is in the NYC Voluntary Cleanup Program.

**Utility Mark-outs:** To promote safety during excavation in this cleanup, the contractor is required to first identify all utilities and must perform all excavation and construction work in compliance with NYC Department of Buildings regulations.

**Soil and Liquid Disposal:** All soil and liquid material removed from the Site as part of the cleanup will be transported and disposed of in accordance with all applicable City, State and Federal regulations and required permits will be obtained.

**Soil Chemical Testing and Screening:** All excavations will be supervised by a trained and properly qualified environmental professional. In addition to extensive sampling and chemical testing of soils on the Site, excavated soil will be screened continuously using hand-held instruments, by sight, and by smell to ensure proper material handling and management, and community protection.

**Stockpile Management:** Soil stockpiles will be kept covered with tarps to prevent dust, odor and erosion. Stockpiles will be frequently inspected. Damaged tarp covers will be

promptly replaced. Stockpiles will be protected with silt fences. Hay bales will be used, as needed to protect storm water catch basins and other discharge points.

**Trucks and Covers:** Loaded trucks leaving the Site will be covered in compliance with applicable laws and regulations to prevent dust and odor. Trucks will be properly recorded in logs and records and placarded in compliance with applicable City, State and Federal laws, including those of the New York State Department of Transportation. If loads contain wet material that can leak, truck liners will be used. All transport of materials will be performed by licensed truckers and in compliance with applicable laws and regulations.

**Imported Material:** All fill materials proposed to be brought onto the Site will comply with rules outlined in this cleanup plan and will be inspected and approved by a qualified worker located on the Site. Waste materials will not be brought onto the Site. Trucks entering the Site with imported clean materials will be covered in compliance with applicable laws and regulations.

**Equipment Decontamination:** All equipment used for cleanup work will be inspected and washed, if needed, before it leaves the Site. Trucks will be cleaned at a truck inspection station on the property before leaving the Site.

**Housekeeping:** Locations where trucks enter or leave the Site will be inspected every day and cleaned regularly to ensure that they are free of dirt and other materials from the Site.

**Truck Routing:** Truck routes have been selected to: (a) limit transport through residential areas and past sensitive nearby properties; (b) maximize use of city-mapped truck routes; (c) limit total distance to major highways; (d) promote safety in entry to highways; (e) promote overall safety in trucking; and (f) minimize off-Site line-ups (queuing) of trucks entering the property. Operators of loaded trucks leaving the Site will be instructed not to stop or idle in the local neighborhood.

**Final Report:** The results of all cleanup work will be fully documented in a final report (called the Remedial Action Report) that will be available for public review online. A link to the online document repository and the public library with Internet access nearest the Site are listed on the first page of this Community Protection Statement document

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

# **REMEDIAL ACTION WORK PLAN**

## **1.0 Project Background**

Shiv Shakti Peeth is working with the NYC Office of Environmental Remediation (OER) in the New York City Voluntary Cleanup Program to investigate and remediate a property located at 264-12 Hillside Avenue in the Hillside section of Queens, New York (the “Site”). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, and complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

## **1.1 Site Location and Background**

The Site is located at 264-12 Hillside Avenue in the Hillside Section of the Borough of Queens, New York, and is currently identified as Block 8794 and Lot 22 on the New York City Tax Map. Figure 1 shows the Site location. The lot is square shaped and approximately 10,000 square feet (sf) in total with 100 feet of street frontage along Hillside Avenue and 100 feet of street frontage on 265<sup>th</sup> Street. A map of the site boundary is shown on Figure 2. Currently, Lot 22 is vacant.

## **1.2 Redevelopment Plan**

The proposed future use of the Site will consist of a new 2-story temple with a full cellar. The 5,550 square foot (sf) first floor will contain a 3,585 sf prayer hall, a 260 sf store, an elevator lobby, a vestibule, two storage rooms, a shoe rack room, an office, a bathroom, an elevator, and a stairwell. The 2,511 sf second floor will consist of 3 private priests' studies, storage, a bathroom, mechanical room, elevator and stairwell, as well as the care takers apartment. The cellar will be 5,550 sf in size and will contain a 2,812 sf dining hall, a kitchen, a walk in cooler, two bathrooms, two storage closets, a mechanical room, a utility closet, a stairwell and an elevator.

The cellar level will require excavation to a total depth of approximately 13 feet below grade and is approximately a 74 feet by 75 feet area. The remaining areas will not be excavated and will be paved or landscaped. The elevator shaft will be excavated an additional 5 feet below grade. Approximately 2,672 cubic yards (cy) (4,000 tons) of soil will be excavated for the cellar. The water table is approximately 66-67 feet below grade surface (bgs) and therefore, will not be encountered during excavation.

Layout of the redevelopment plans for the cellar is presented in Figure 3. The current zoning designation is R2-3 with a C1-3 commercial overlay. The remedial action contemplated under this RAWP may be implemented independently of the proposed redevelopment plan.

### 1.3 Description of Surrounding Property

The area immediately surrounding Site consists of residential buildings to the north (across Hillside Avenue), west and south; and an industrial building to the east (across 265th Street). Figure 4 shows the surrounding land usage of the adjacent properties listed below as well as additional properties located up to 500 feet away from the Site. No schools, daycare facilities, or hospitals were identified within a 500 ft radius of the Site.

**Surrounding Property Usage**

<b>Direction</b>	<b>Property Description</b>
<b>North –</b> <i>Across Hillside Avenue</i>	<u>Block 8776, Lot 98 – 83-60 265 Street:</u> a 2,000 sf residential lot developed with a multi-family walk up.
<b>South –</b> <i>Adjacent property</i>	<u>Block 8794, Lot 27 – 84-12 265 Street.</u> One 4,000 sf lots developed with a 1 and 2 family residential dwelling.
<b>East –</b> <i>Across 265th Street</i>	<u>Block 8795, Lot 14 - 265-08 Hillside Avenue:</u> A 10,000 sf property developed with an industrial/manufacturing building.
<b>West –</b> <i>Adjacent property</i>	<u>Block 8794, Lots 15, 16, 18 and 20 - 84-01 to 84-07 264 Street:</u> A 2,225 sf lot developed with a mixed residential and commercial use building, a 2,242 sf lot developed with a residential multi-family walk up, and two 2,742 sf lots each developed with a residential multi-family walk up.

Figure 4 shows the surrounding land usage.

#### **1.4 Summary of Past Site Uses and Areas of Concern**

According to historical sources, the Site was occupied as a gasoline service station and automobile repair facility as early as 1966. Gasoline service operations continued onsite until approximately 1991, when the property was solely occupied by an automobile repair facility. According to the regulatory agency records, the regulatory database, and prior reports, the subject property was formerly equipped with a total of twelve (12) gasoline underground storage tanks (USTs) all totaling 550-gallons in size and located in the central eastern portion of the property in a tank field. The Site is currently vacant and is equipped with one (1) 550-gallon waste oil underground storage tank (UST) and one (1) 550-gallon heating oil UST.

- A Gasoline Tanks Excavation Report, prepared by Phoenix Environmental Technologies, Inc. (PET) (dated August 22, 2003) detailed the removal of all twelve gasoline USTs, as well as associated underground piping and pump islands. Soils located immediately outside the concrete encasement and beneath the dispenser islands were screened using a Photo Ionization Detector (PID) which recorded readings ranging from 0.0 to 15 parts per million (ppm). Groundwater was not encountered during excavation activities. Following excavation and field screening activities, a total of five (5) soil samples were collected for analysis. All five (5) soil samples were for volatile organic compounds (VOCs) analysis via EPA Method 8021. Reportedly, only one sample, TF-South, was found to contain VOC contamination. The only compound detected was methyl tertiary butyl ether (MTBE) at a concentration of 19 µg/kg; which is below its respective standard.
- A second Subsurface Investigation Report, prepared by EMS, dated June 14, 2011 included the advancement of six (6) borings in the area of the former tank field and dispenser islands on the subject property. Soil samples were submitted for analysis of the STARS List VOCs including benzene, toluene, ethylbenzene, xylenes, and MTBE, using Method SW-846-8260. No VOCs concentrations in excess of recommended NYS TAGM Recommended Soil Cleanup Objectives (RSCOs) were

reported in any of the soil samples collected from the borings located within the former tank field.

In May 2014, a AEI consultants conducted a Limited Phase II Subsurface Investigation, which included a geophysical survey. The purpose of the geophysical survey was to outline the current USTs and provide utility clearance. A total of six (6) soil borings (AEI-B1 through AEI-B6) were advanced on the Site. The borings were advanced using a direct-push drilling method. Each boring was advanced to a depth of 20 feet bgs. No elevated PID readings were reported, and no odors or staining were observed in any of the soil columns. Due to the lack of contaminants detected above the NYSDEC Unrestricted SCOs, the NYSDEC CP-51 Unrestricted Residential SCOs, and the NYSDEC CP-51 Commercial SCOs, it does not appear that a reportable release has occurred in the areas evaluated.

Areas of Concern (AOCs) identified for the Site include:

4. The presence of historic fill material to depths as great as 2 feet.
5. The Site was occupied as a gasoline service station and automobile repair facility as early as 1966. Gasoline service operations continued onsite until approximately 1991. There after the site was occupied as an auto repair facility.
6. The Site was most recently developed as an automobile repair facility and is equipped with one (1) 550-gallon waste oil underground storage tank (UST) and one (1) 550-gallon heating oil UST.

## **1.5 Summary of Work Performed under the Remedial Investigation**

EBC performed the following scope of work at the Site in September and December of 2015:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed seven soil borings across the Site, and collected fourteen soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed three groundwater monitoring wells throughout the Site and collected three groundwater samples and one duplicate groundwater sample for chemical analysis to evaluate groundwater quality;

4. Installed five soil gas implants and collected five soil gas samples for chemical analysis.

## **1.6 Summary of Findings of Remedial Investigation**

A remedial investigation was performed and the results are documented in a companion document called “Remedial Investigation Report, 264-12 Hillside Avenue”, dated February 2016 (RIR).

1. The elevation of the Site is approximately 109 feet above sea level.
2. Depth to groundwater is estimated to be approximately 66-67 feet below sidewalk grade.
3. Groundwater flow is generally southwest.
4. Depth to bedrock at the Site is greater than 100 feet.
5. The stratigraphy of the Site from the surface down consists of historic fill material to depths as great as 2 feet, underlain by native brown silty, sand and clay.
6. Soil/fill samples results were compared to the New York State Department of Environmental Conservation (NYSDEC) 6NYCRR Part 375 Section 6.8 Track 1 Unrestricted Use as well as to Track 2 Restricted Residential Use Soil Cleanup Objectives (SCOs). No PCBs were detected in any of the samples, and no VOCs or SVOCs were detected above Unrestricted Use SCOs. Two pesticides, alpha-chlordane (max. of 9,200 µg/kg) and chlordane (max. of 94,000 µg/kg), were detected above Restricted Residential SCOs in the shallow soil samples. Several metals including arsenic (max. of 16 mg/kg), copper (max. of 105 mg/kg), lead (max. of 99.2 mg/kg) and mercury (max. of 0.54 mg/kg) exceeded Unrestricted Use SCOs within all shallow soil samples. Of these metals, arsenic also exceeded its Restricted Residential Use SCOs in one of the shallow soil samples. Overall, the soil results were consistent with data identified at sites with urban fill material in NYC with the exception of the chlordane identified above Restricted Residential SCOs which will be treated as a hotspot.
7. Groundwater samples results were compared to New York State 6NYCRR Part 703.5 Class GA Groundwater Quality Standards (GQS). Groundwater samples collected during the investigations showed no pesticides at detectable concentrations. Several VOCs were detected with 1,1,1-trichloroethane (max. of 8 µg/L) 1,1,2-trichloroethane (4.5 µg/L), 1,1-dichloroethane (34 µg/L), 1,2-dichloroethane (10 µg/L), 1,2-dichloropropane (13 µg/L), 2,2-dichloropropane (14 µg/L), bromomethane (max of 25 µg/L), carbon

tetrachloride (max of 19 µg/L), chloroethane (max of 24 µg/L), chloroform (max of 6,600 µg/L), chloromethane (max of 270 µg/L), acetone (max of 120 µg/L), and methylene chloride (max. of 85 µg/L) exceeding their respective GQS. One SVOC, benzoic acid (max. of 240 µg/L) was detected in trace concentrations. One PCB, PCB-1016 (max. of 0.061 µg/L) was detected above GQS in one of the three samples and within the duplicate. Several metals were identified in groundwater, but only antimony (max. of 0.006 mg/L), chromium (max. of 0.74 mg/L), iron (max. of 0.58 mg/L), and sodium (max. of 1,210 mg/L) exceeded their respective GQS in all three groundwater samples and the duplicate.

8. Soil vapor samples collected during the RI were compared to the compounds listed in the NYSDOH located in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion dated October 2006 matrices. Soil vapor samples collected during the RI showed high levels of petroleum-related VOCs and chlorinated VOCs. The total concentration of petroleum-related VOCs (BTEX) ranged from 1,798.9 µg/m<sup>3</sup> to 5,254.3 µg/m<sup>3</sup>. The chlorinated VOC, trichloroethylene (TCE) was detected in two of the soil gas samples ranging in concentrations from 0.27 µg/m<sup>3</sup> to 1.5 µg/m<sup>3</sup>. Tetrachloroethylene (PCE) was detected in all soil gas samples ranging in concentration from 24.1 µg/m<sup>3</sup> to 416 µg/m<sup>3</sup>. Carbon tetrachloride (at 0.28 µg/m<sup>3</sup>) was detected in one of the soil gas samples. 1,1,1-trichloroethane (TCA) with a maximum concentration of 4.51 µg/m<sup>3</sup> was detected in one of the soil vapor sample. Concentrations of chlorinated VOC PCE were above the monitoring level ranges established within the NYSDOH soil vapor guidance matrix.

For more detailed results, consult the RIR. Based on an evaluation of the data and information from the RIR and this RAWP, disposal of significant amounts of hazardous waste is not suspected at this site.

## **2.0 Remedial Action Objectives**

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

**Soil**

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

**Groundwater**

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

**Soil Vapor**

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

### **3.0 Remedial Alternatives Analysis**

The goal of the remedy selection process is to select a remedy that is protective of human health and the environment taking into consideration the current, intended and reasonably anticipated future use of the property. The remedy selection process begins by establishing RAOs for media in which chemical constituents were found in exceedance of applicable standards, criteria and guidance values (SCGs). Remedial alternatives are then developed and evaluated based on the following ten criteria:

- Protection of human health and the environment;
- Compliance with SCGs;
- Short-term effectiveness and impacts;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume of contaminated material;
- Implementability;
- Cost effectiveness;
- Community Acceptance;
- Land use; and
- Sustainability.

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

#### **Alternative 1:**

- Removal of all soil/fill exceeding Track 1 Unrestricted Use SCOs as defined in NYSDEC 6NYCRR Part 375-6.8 throughout the Site and confirmation that Track 1 Unrestricted Use SCOs have been achieved with post-excavation endpoint sampling. Based on the results of the Remedial Investigation, it is expected that this alternative would be achieved by excavating the entire site to a depth of at least 2 feet across the entire site to remove historical fill. If soil/fill containing analytes at concentrations above Unrestricted Use SCOs is still present at the base of the excavation after removal of all soil required

for construction of the new building's cellar level is complete, additional excavation would be performed to ensure complete removal of soil that does not meet Track 1 Unrestricted Use SCOs.

- No Engineering or Institutional Controls are required for a Track 1 cleanup. As part of development, a vapor barrier and passive sub-slab depressurization system (SSDS) would be installed to prevent potential exposures from off-Site soil vapor in the future. It should be noted that an active SSDS is not an allowable vapor mitigation strategy for a Track 1 Unrestricted Use Cleanup, since ongoing Site Management is required.

**Alternative 2:**

- Selection of NYSDEC 6NYCRR Part 375-6.8, Restricted Residential Use SCOs as well as the groundwater protection standard for alpha-chlordane and gamma-chlordane.
- Removal of all soil/fill exceeding SCO's and confirmation that SCO's have been achieved with post-excavation end point sampling. Based on the results of the Remedial Investigation, it is expected that this alternative would be achieved by excavating a 74 x 75 foot area down to 13 feet and an additional 5 feet of excavation for the elevator pit. The remaining areas on site would not be excavated unless SCO exceedance is identified. If soil/fill containing analytes at concentrations above Track 2 Restricted Residential SCO's is still present at the base of the excavation, additional excavation would be performed to meet Track 2 Restricted Residential SCO's and the Groundwater Protection Standard for alpha-chlordane and gamma-chlordane.
- Placement of a composite cover system over the entire Site to prevent exposure to remaining soil/fill;
- Installation of a vapor barrier system beneath the building slab and along foundation side walls to prevent potential exposures from soil vapor;
- Installation of an active Sub Slab Depressurization System (SSDS);
- Establishment of use restrictions including prohibitions on the use of groundwater from the Site; prohibitions of restricted Site uses, such as farming or vegetable gardening, to prevent future exposure pathways; and prohibition of a higher level of land use without OER approval;

- Establishment of an approved Site Management Plan (SMP) to ensure long-term management of these Engineering and Institutional Controls including the performance of periodic inspections and certification that the controls are performing as they were intended. The SMP will note that the property owner and property owner's successors and assigns must comply with the approved SMP; and
- The property will continue to be registered with an E-Designation at the NYC Buildings Department.

### **3.1 Threshold Criteria**

#### **Protection of Public Health and the Environment**

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

Alternative 1 would be protective of human health and the environment by removing all soil/fill exceeding Track 1 Unrestricted Use SCO's and groundwater protection standards, thus eliminating potential for direct contact with contaminated soil/fill once construction is complete and eliminating the risk of contaminants leaching into groundwater. Potential post-remediation exposures to on-Site residents from soil vapors would remain a potential concern since the volatile contaminants in soil vapor may originate from off-Site source(s). This would be addressed by the installation of a vapor barrier and SSDS beneath the foundation of the building's basement. A Track 1 Remedy cannot employ ICs or ECs. Therefore, even though Alternative 1 would provide the maximum protection of public health and the environment based on on-Site contamination, Alternative 1 would not allow for ongoing monitoring and reporting of Engineering and Institutional controls that are needed to prevent soil vapor migration into the building over the long term.

Alternative 2 would achieve comparable protections of human health and the environment by excavation and removal of most of the historic fill at the Site and by ensuring that remaining soil/fill on-Site meets Track 2 Restricted Residential SCOs, as well as by placement of Institutional and Engineering Controls, including a composite cover system. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. Potential future migration of off-Site soil vapors into the new building would be prevented by installing a vapor barrier below the building slab and outside foundations walls below grade as well as by installing an active sub-slab depressurization system. Implementing Institutional Controls including a Site Management Plan and continuing the E-designation on the property would ensure that the composite cover system remains intact and protective of public health. Establishment of Track 2 Restricted Residential SCO's and groundwater protection SCOs for alpha-chlordane and gamma-chlordane would minimize the risk of contamination leaching into groundwater.

For both Alternatives, potential exposure to contaminated soils or groundwater during construction would be minimized by implementing a Construction Health and Safety Plan, an approved Soil/Materials Management Plan and Community Air Monitoring Plan (CAMP). Potential contact with contaminated groundwater would be prevented as its use is prohibited by city laws and regulations.

### **3.2 Balancing Criteria**

#### **Compliance with Standards, Criteria and Guidance (SCGs)**

This evaluation criterion assesses the ability of the alternative to achieve applicable standards, criteria and guidance.

Alternative 1 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil to achieve Track 1 Unrestricted Use SCO's and Protection of Groundwater SCO's. Compliance with SCGs for soil vapor would require engineering and institutional controls if off-site sources continue to warrant active vapor management after excavation.

Alternative 2 would achieve compliance with the remedial goals, chemical-specific SCG's and RAOs for soil through removal of soil to meet Track 2 Restricted Residential SCO's and groundwater protection SCOs for alpha-chlordane and gamma-chlordane. Compliance with SCG's for soil vapor would also be achieved by installing a waterproofing/vapor barrier system below the new building's basement slab and continuing the vapor barrier outside of subgrade foundation walls and installing an active SSDS system. A Site Management Plan would ensure that these controls remained protective for the long term.

Health and safety measures contained in the CHASP and Community Air Monitoring Plan (CAMP) will be implemented during Site redevelopment under this RAWP. For both Alternatives, focused attention on means and methods employed during the remedial action would ensure that handling and management of contaminated material would be in compliance with applicable SCGs. These measures will protect on-site workers and the surrounding community from exposure to Site-related contaminants.

### **Short-Term Effectiveness and Impacts**

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

Both Alternative 1 and 2 have similar short-term effectiveness during their implementation, as each requires excavation of historic fill material. Both alternatives would result in short-term dust generation impacts associated with excavation, handling, load out of materials, and truck traffic. Short-term impacts could potentially be higher for Alternative 1 since excavation of greater amounts of historical fill material would take place. However, focused attention to means and methods during a Track 1 removal action, including community air monitoring and appropriate truck routing, would minimize the overall impact of these activities.

An additional short-term adverse impact and risks to the community associated with both remedial alternatives is increased truck traffic. Truck traffic will be routed on the most direct

course using major thoroughfares where possible and flag persons will be used to protect pedestrians at Site entrances and exits.

The potential adverse impact to the community, workers and the environment for both alternatives would be minimized through implementation of control plans including a Construction Health and Safety Plan, a Community Air Monitoring Plan (CAMP) and a Soil/Materials Management Plan (SMMP), during all on-Site soil disturbance activities and would minimize the release of contaminants into the environment. Both alternatives provide short-term effectiveness in protecting the surrounding community by decreasing the risk of contact with on-Site contaminants. Construction workers operating under appropriate management procedures and a Construction Health and Safety Plan (CHASP) would provide protection from on-Site contaminants by using personal protective equipment would be worn consistent with the documented risks within the respective work zones.

### **Long-term effectiveness and permanence**

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

Alternative 1 would achieve long-term effectiveness and permanence related to on-Site contamination by permanently removing all impacted soil/fill above Track 1 Unrestricted Use SCO's. Removal of on-Site contaminant sources will also prevent future groundwater contamination. However, engineering and institutional controls may be required to prevent exposure to off-Site soil vapor contamination in the long term.

Alternative 2 would provide long-term effectiveness by removing most on-Site contamination and attaining Track 2 Restricted Residential SCOs and groundwater protection SCOs for alpha-

chlordane and gamma-chlordane; installing a composite cover system across the Site; installing an active SSDS and vapor barrier system, maintaining use restrictions; establishing an SMP to ensure long-term management of ICs and ECs; and maintaining registration as an E-designated property to memorialize these controls for the long term. The SMP would ensure long-term effectiveness of all ECs and ICs by requiring periodic inspection and certification that these controls and restrictions continue to be in place and are functioning as they were intended, assuring that protections designed into the remedy continue to provide the required level of protection.

### **Reduction of toxicity, mobility, or volume of contaminated material**

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

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

Alternative 2 would remove most of the historic fill at the Site, and all remaining on-Site soil/fill beneath the new building will meet Track 2 Restricted Residential SCO's. Alpha-chlordane and gamma-chlordane would also meet Groundwater Protection SCOs.

Alternative 1 would remove a greater total mass of contaminants from the Site. The removal of soil for the new development in both scenarios would lessen the difference in contaminant mass removal between these two alternatives.

## **Implementability**

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

The techniques, materials and equipment to implement both Alternatives 1 and 2 are readily available and have been proven to be effective in remediating the contaminants present on the Site. They use standard equipment and technologies that are well established in the industry. The reliability of each remedy is also high. There are no special difficulties associated with any of the activities proposed.

## **Cost effectiveness**

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

Since historic fill at the Site was only found to extend to a depth of up to 2 feet below grade during the RI, and the new building requires excavation of the entire Site to a depth of 13 feet in a 75 x 74 area and an additional 5 feet in the vicinity for the elevator pit, the costs associated with Alternative 1 would likely be greater. Costs associated with Alternative 1 could potentially be higher than Alternative 2 if soil with analytes above Track 1 Unrestricted Use SCOs is encountered below the excavation depth required for development. Additional costs would include installation of additional shoring/underpinning, disposal of additional soil, and import of clean soil for backfill. However, long-term costs for Alternative 2 are likely higher than Alternative 1 based on implementation of an active SSDS system and a Site Management Plan as part of Alternative 2.

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

## **Community Acceptance**

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

This RAWP will be subject to a public review under the NYC VCP and will provide the opportunity for detailed public input on the remedial alternatives and the selected remedy. This public comment will be considered by OER prior to approval of this plan. The Citizen Participation Plan for the project is provided in Appendix 2. Observations here will be supplemented by public comment received on the RAWP. Under both alternatives, the overall goals of the remedial program, to protect public health and the environment and eliminate potential contaminant exposures, have been broadly supported by citizens in NYC communities.

## **Land use**

This evaluation criterion addresses the proposed use of the property. This evaluation has considered reasonably anticipated future uses of the Site and takes into account: current use and historical and/or recent development patterns; applicable zoning laws and maps; NYS Department of State's Brownfield Opportunity Areas (BOA) pursuant to section 970-r of the general municipal law; applicable land use plans; proximity to real property currently used for residential use, and to commercial, industrial, agricultural, and/or recreational areas; environmental justice impacts, Federal or State land use designations; population growth patterns and projections; accessibility to existing infrastructure; proximity of the site to important cultural resources and natural resources, potential vulnerability of groundwater to contamination that might emanate from the site, proximity to flood plains, geography and geology; and current Institutional Controls applicable to the site.

The current, intended, and reasonably anticipated future land use of the Site and its surroundings are compatible with the selected remedy of soil remediation. The proposed future use of the Site includes a new two story temple building with a cellar. Following remediation, the Site will meet either Track 1 Unrestricted Use or Track 2 Restricted Residential SCOs modified with groundwater protection SCOs for alpha-chlordane and gamma-chlordane, both of which are protective of public health and the environment for its planned residential use. The proposed use is compliant with the property's zoning and is consistent with recent development patterns. The areas surrounding the site are developed with mainly residential buildings. The development would remediate a vacant contaminated lot and provide a community facility. The proposed development would clean up the property and make it safer, create new employment opportunities and other economic benefits from land revitalization.

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

### **Sustainability of the Remedial Action**

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

and promotion of the use of native vegetation and enhancing biodiversity during landscaping associated with Site development.

While Alternative 2 would potentially result in lower energy usage based on reducing the volume of material transported off-Site, both remedial alternatives are comparable with respect to the opportunity to achieve sustainable remedial action. The remedial plan for either alternative would take into consideration the shortest trucking routes during off-Site disposal of historic fill and other soils, which would reduce greenhouse gas emissions and conserve energy used to fuel trucks. The New York City Clean Soil Bank program is available for reuse of any clean native soils under either alternative. A complete list of green remedial activities considered as part of the NYC VCP is included in a Sustainability Statement.

## **4.0 Remedial Action**

### **4.1 Summary of Preferred Remedial Action**

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

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establishment of Track 2 Restricted Residential Soil Cleanup Objectives (SCOs) and groundwater protection SCOs for alpha and gamma chlordane. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility(s).
6. Excavation and removal of soil/fill exceeding Track 2 Restricted Residential, SCOs. A 75 x 74 area (the cellar) will be excavated to a depth of approximately 13 feet below grade for development purposes. In addition the area of the elevator pit will be excavated an additional 5 feet. Excavation and removal of all locations where alpha-Chlordane and gamma-Chlordane exceed SCOs.

7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site.
8. Management of excavated materials including temporarily stockpiling and segregating in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials.
9. Removal of the waste oil UST and the heating oil UST. Registration of tanks and reporting of any petroleum spills associated with UST's and appropriate closure of these petroleum spills in compliance with applicable local, State and Federal laws and regulations.
10. Transportation and off-Site disposal of all soil/fill material at licensed or permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media on-Site.
11. Demarcation of residual soil/fill in landscaped areas.
12. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
13. Construction of an engineered composite cover consisting of a six-inch thick concrete building slab in the cellar area. A six inch concrete slab or two feet of clean soil will be used to cover the unexcavated areas. Installation of a vapor barrier system consisting of vapor barrier beneath the building slab and outside of sub-grade foundation sidewalls. The vapor barrier system will consist of a 20-mil Raven Industries VaporBlock 20+ below the slab throughout the full building area and a 20-mil Raven Industries VaporBlock 20+ outside all sub-grade foundation sidewalls. All welds, seams and penetrations will be properly sealed to prevent preferential pathways for vapor migration. The vapor barrier system is an Engineering Control for the remedial action. The remedial engineer will certify in the RAR that the vapor barrier system was designed and properly installed to mitigate soil vapor migration into the building
14. Installation of an active sub-slab depressurization system (SSDS) consisting of three loops installed beneath the basement slab of the building. The SSDS loops will

provide the correct coverage in accordance with USEPA sub-slab depressurization design specifications which recommend a separate vent loop for every 4,000 ft<sup>2</sup> of slab area. The horizontal vent line is to be constructed of a continuous loop of perforated 4-inch HDPE pipe fitted with a filter sock. Fill material around the horizontal vent piping will be ¾ inch gravel with round edges. The horizontal pipe will extend to an adjacent utility chase-way where it will be piped to the roof via a 6-inch schedule 40 Cast Iron line. The exhaust stack will be located a minimum of 10 feet from windows and ventilation inlets and a minimum of 6" above the roof line as per MC512.4 All other applicable provisions of the NYC BC, MC, and PC shall be complied with. The active SSDS will be hardwired and will include a blower installed on the roof line and a pressure gauge and alarm located in an accessible area in the basement. The active sub-slab depressurization system is an Engineering Control for the remedial action. The remedial engineer will certify in the RAR that the active sub-slab depressurization system was designed and properly installed to establish a vacuum in the gas permeable layer and a negative (decreasing outward) pressure gradient across the building slab to prevent vapor migration into the building.

15. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
16. Performance of all activities required for the remedial action, including acquisition of required permits and attainment of pretreatment requirements, in compliance with applicable laws and regulations.
17. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
18. Submission of a RAR that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and describes all Engineering and Institutional Controls to be implemented at the Site.
19. Submission of an approved Site Management Plan (SMP) in the Remedial Action Plan (RAR) for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.

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

## **4.2 Soil Cleanup Objectives and Soil/ Fill Management**

Track 2 Restricted Residential SCOs are proposed for this project and SCOs are defined in 6 NYCRR Part 375, Table 6.8 Track 2 Restricted Residential Use. Additionally the SCOs for alpha-Chlordane and gamma-Chlordane will be the lesser of their Groundwater Protection Standards and Restricted Residential SCOs: 2.9 ppm for alpha-chlordane and 14 ppm for gamma-chlordane.

Soil and materials management on-Site and off-Site, including excavation, handling and disposal, will be conducted in accordance with the Soil/Materials Management Plan in Appendix 4. Discrete contaminant sources (such as hotspots) identified during the remedial action will be identified by GPS or surveyed. This information will be provided in the Remedial Action Report.

### **Soil/Fill Excavation and Removal**

A 75 x 74 area (the cellar) will be excavated to a depth of 13 feet for the new building. In addition, the elevator pit area will be excavated an additional 5 feet. The remaining areas on site will not be excavated except to remove SCO exceedances. The location of planned excavations is shown in Figure 5. The total quantity of soil/fill expected to be excavated and disposed off-Site is 4,000 tons. For each disposal facilities to be used in the remedial action, a letter from the developer/QEP to the receiving facility requesting approval for disposal and a letter back to the developer/QEP providing approval for disposal will be submitted to OER prior to any transport and disposal of soil at a facility.

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

## **End-point Sampling**

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

- Volatile organic compounds by EPA Method 8260;
- Semi-volatile organic compounds by EPA Method 8270;
- Target Analyte List metals; and
- Pesticides/PCBs by EPA Method 8081/8082.

New York State ELAP certified labs will be used for all end-point sample analyses. Labs performing end-point sample analyses will be reported in the RAR. The RAR will provide a tabular and map summary of all end-point sample results and will include all data including non-detects and applicable standards and/or guidance values.

## **Confirmation End-point Sampling**

Removal actions for development purposes under this plan will be performed in conjunction with confirmation end-point soil sampling. Seven confirmation samples will be collected from the base of the excavation at locations to be determined by OER. To evaluate attainment of Track 2 SCOs, analytes will include those for which SCOs have been developed, including list VOCs, SVOCs, PCBs, pesticides and metals according to analytical methods described above.

## **Hotspot End-point Sampling**

. End point samples will be analyzed for SCO trigger parameters and will be coordinated with OER in advance of sampling.

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

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.
2. For excavations 20 to 300 feet in perimeter:

- For surface removals, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
  - For subsurface removals, one sample from each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
3. For sampling of volatile organics, bottom samples should be taken within 24 hours of excavation, and should be taken from the zero to six-inch interval at the excavation floor. Samples taken after 24 hours should be taken at six to twelve inches.
  4. For contaminated soil removal, post remediation soil samples for laboratory analysis should be taken immediately after contaminated soil removal. If the excavation is enlarged horizontally, additional soil samples will be taken pursuant to bullets 1-3 above.

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

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

### **Quality Assurance/Quality Control**

The fundamental QA objective with respect to accuracy, precision, and sensitivity of analysis for laboratory analytical data is to achieve the QC acceptance of the analytical protocol. The accuracy, precision and completeness requirements will be addressed by the laboratory for all data generated.

One blind duplicate sample for every 20 samples collected will be submitted to the approved laboratory for analysis of the same parameters. Trip blanks will be used whenever samples are transported to the laboratory for analysis of VOCs. One trip blank will be submitted to the laboratory with each shipment of soil samples. Trip blanks will not be used for samples to be analyzed for metals, SVOCs or pesticides.

Collected samples will be appropriately packaged, placed in coolers and shipped via overnight courier or delivered directly to the analytical laboratory by field personnel. Samples will be containerized in appropriate laboratory provided glassware and shipped in plastic coolers. Samples will be preserved through the use of ice or “cold-paks” to maintain a temperature of 4°C.

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

- Gently tap or scrape to remove adhered soil
- Rinse with tap water
- Wash withalconox® detergent solution and scrub
- Rinse with tap water
- Rinse with distilled or deionized water

Field blanks will be prepared by pouring distilled or deionized water over decontaminated equipment and collecting the water in laboratory provided containers. Trip blanks will be used whenever samples are transported to the laboratory for analysis of VOCs.

## **Import of Soils**

Import of soils onto the property will be performed in conformance with the Soil/Materials Management Plan in Appendix 4. Imported soil will meet the lower of:

- Track 2 Restricted Residential Use SCO's, and

- Groundwater Protection Standards in Part 375-6.8.

If the unexcavated areas will be landscaped; the estimated quantity of soil to be imported into the Site for cover soil is 70 tons. A map of soil backfill placement locations is shown in Figure 5; indicated as capped or landscaped areas.

## **Reuse of Onsite Soils**

Soil reuse is not planned on this project.

### **4.3 Engineering Controls**

Engineering Controls will be employed in the remedial action to address residual contamination remaining at the site. The Site has three primary Engineering Control Systems. These are:

- (1) Composite Cover System
- (2) Soil Vapor Barrier System
- (3) Active Sub-Slab Depressurization System

#### **Composite Cover System**

Exposure to residual soil/fill will be prevented by an engineered, composite cover system to be built on the Site. This composite cover system will be comprised of a 6 inches concrete slab underlain by 6 inches of clean sub-base material in building areas. The unexcavated areas will be covered by 6 inches of concrete or 2 feet of clean soil.

Figure 5 shows the typical design for each remedial cover type used on this Site. Figure 5 shows the location of each cover type built at the Site.

The composite cover system will be a permanent engineering control. The system will be inspected and its performance certified at specified intervals as required by this RAWP and the Site Management Plan. A Soil and Materials Management Plan will be included in the Site Management Plan and will outline the procedures to be followed in the event that the composite cover system and underlying residual soil/fill is disturbed after the remedial action is complete.

Maintenance of this composite cover system will be described in the Site Management Plan in the Remedial Action Report.

### **Vapor Barrier System**

Migration of soil vapor from onsite or offsite sources into the building will be mitigated with a combination of building slab and vapor barrier. The vapor barrier will be installed beneath the cellar area. The vapor barrier will consist of Raven Industries' VaporBlock 20 Plus, which is a seven layer co-extruded barrier made from state-of-the-art polyethylene and EVOH resins. The specifications for installation will be provided to the construction management company and the foundation contractor or installer of the liner. The specifications state that all vapor barrier seams, penetrations, and repairs will be sealed either by the tape method or weld method, according to the manufacturer's recommendations and instructions.

The vapor barrier will extend throughout the area occupied by the footprint of the new building and up the foundation sidewalls and will be installed in accordance with manufacturer specifications.

A plan view showing the location of the proposed vapor barrier system is provided in Figure 7. Typical design sections for the vapor barrier on slab and sidewalls are provided in Figure 7. Product specification sheets are provided in Appendix 6. The Remedial Action Report will include as-built drawings and diagrams; manufacturer documentation; and photographs.

The Remedial Action Report will include a PE certified letter (on company letterhead) from primary contractor responsible for installation oversight and field inspections and a copy of the manufacturer's certificate of warranty.

### **Sub-Slab Depressurization System**

Migration of soil vapor into the building will be mitigated with the construction of an active Sub-Slab Depressurization System (SSDS). The SSDS consisting of three loops installed beneath the basement slab of the building. The SSDS loops will provide the correct coverage in accordance with USEPA sub-slab depressurization design specifications which recommend a separate vent loop for every 4,000 ft<sup>2</sup> of slab area. The horizontal vent line is to be constructed of

a continuous loop of perforated 4-inch HDPE pipe fitted with a filter sock. Fill material around the horizontal vent piping will be ¾ inch gravel with round edges. The horizontal pipe will extend to an adjacent utility chase-way where it will be piped to the roof via a 6-inch schedule 40 Cast Iron line. The exhaust stack will be located a minimum of 10 feet from windows and ventilation inlets and a minimum of 6" above the roof line as per MC512.4 All other applicable provisions of the NYC BC, MC, and PC shall be complied with. The active SSDS will be hardwired and will include a blower installed on the roof line and a pressure gauge and alarm located in an accessible area in the basement. The active sub-slab depressurization system is an Engineering Control for the remedial action. The remedial engineer will certify in the RAR that the active sub-slab depressurization system was designed and properly installed to establish a vacuum in the gas permeable layer and a negative (decreasing outward) pressure gradient across the building slab to prevent vapor migration into the building.

The SSDS is a permanent engineering control. The system will be inspected and its performance certified at specified intervals as required by this RAWP and the Site Management Plan. Maintenance of this SSDS will be described in the Site Management Plan in the Remedial Action Report. The location and layout of the SSDS is shown in Figure 8. A typical section of the system is shown in Figure 9.

#### **4.4 Institutional Controls**

A series of Institutional Controls (IC's) are required under this Remedial Action to assure permanent protection of public health by elimination of exposure to residual materials. These IC's define the program to operate, maintain, inspect and certify the performance of Engineering Controls and Institutional Controls on this property. Institutional Controls would be implemented in accordance with a Site Management Plan included in the final Remedial Action Report (RAR). Institutional Controls would be:

- Continued registration of the E-Designation for the property. This RAWP includes a description of all ECs and ICs and summarizes the requirements of the SMP which will

note that the property owner and property owner's successors and assigns must comply with the approved SMP;

- Submittal of a SMP in the RAR for approval by OER that provides procedures for appropriate operation, maintenance, inspection, and certification of ECs and IC's. SMP will require that the property owner and property owner's successors and assigns will submit to OER a periodic written statement that certifies that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by OER; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. OER retains the right to enter the Site in order to evaluate the continued maintenance of any controls. This certification shall be submitted at a frequency to be determine by OER in the SMP and will comply with RCNY §43-1407(1)(3).
- Vegetable gardens and farming on the Site are prohibited in contact with residual soil materials;
- Use of groundwater underlying the Site is prohibited without treatment rendering it safe for its intended use;
- All future activities on the Site that will disturb residual material must be conducted pursuant to the soil management provisions in an approved SMP;
- The Site will be used for restricted residential use and will not be used for a higher level of use without prior approval by OER.

#### **4.5 Site Management Plan**

Site Management is the last phase of remediation and begins with the approval of the Remedial Action Report and issuance of the Notice of Completion (NOC) for the Remedial Action. The Site Management Plan (SMP) describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by this RAWP. The Site Management Plan is submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER. The property owner is responsible to ensure that all Site Management responsibilities defined in the Site Management Plan are implemented.

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

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

#### **4.6 Qualitative Human Health Exposure Assessment**

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

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

#### **Known and Potential Contaminant Sources**

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

Soil:

- Pesticides including: alpha-Chlordane and gamma-Chlordane exceeding Restricted Residential Use SCOs;
- Metals such as arsenic; which exceeded Restricted Residential Use SCO;

Groundwater:

- VOCs including: 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,1-dichloroethane, 1,2-dichloroethane, 1,2-dichloropropane, 2,2-dichloropropane, bromomethane, carbon tetrachloride, chloroethane, chloroform, chloromethane and methylene chloride which were above their respective Groundwater Quality Standards (GQSs);
- Dissolved metals including: antimony, chromium, iron and sodium above GQS;

Soil Vapor:

- CVOCs such as tetrachloroethene were above the NYS DOH Soil Vapor monitoring values; and
- Petroleum-related VOCs including benzene, toluene, ethylbenzene, and xylene.

**Nature, Extent, Fate and Transport of Contaminants**

The information compiled during previous investigations has confirmed the presence of historic fill material from surface grade to an approximate depth of 2 feet bgs.

Soil: Two pesticides and one metal above Restricted Residential Use SCOs were only identified in shallow soil on site. While the metal concentrations are consistent with those identified in historical fill material throughout NYC, the pesticide concentrations are indicative of a discreet shallow contaminant source. Elevated pesticide concentrations were not identified in deep soil samples, nor in groundwater, demonstrating that the pesticides are not migrating into groundwater.

Groundwater: Twelve VOCs and four metals were above GQS. However, none of the metals or VOCs with GQS exceedances were detected above Unrestricted Use or groundwater protection SCOs in soils, demonstrating that the groundwater exceedances are not related to an on-site source. Furthermore, the groundwater exceedances were identified in upgradient wells which also indicates an off-site source of VOC contamination.

Soil Vapor: High levels of petroleum related VOCs were noted in soil vapor and are likely associated with former gas station operations and USTs. Concentrations of chlorinated VOC PCE were above the monitoring level ranges established within the NYSDOH soil vapor

guidance matrix. PCE was not noted in on-site soil or groundwater samples and may indicate that the contaminant is migrating from an off-site source.

## **Receptor Populations**

**On-Site Receptors:** The site is currently vacant and capped; access to the Site is restricted by an 8 foot high, chained and locked, perimeter fence. Onsite receptors are limited to trespassers, site representatives and visitors granted access to the property. During construction, potential on-site receptors include construction workers, site representatives, and visitors. Under proposed future conditions, potential on-site receptors include adult and child building residents, workers and visitors.

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

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

## **Potential Routes of Exposure**

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

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

## **Potential Exposure Points**

*Current Conditions:* The site is currently capped with asphalt there are no potential exposure pathways from ingestion, inhalation, or dermal absorption of soil/ fill. Groundwater is not exposed at the site. The site is served by the public water supply and groundwater is not used at

the site for potable supply and there is no potential for exposure. Because the site is currently undeveloped, there is no potential for soil vapor to accumulate on site.

*Construction/ Remediation Conditions:* During the remedial action, onsite workers will come into direct contact with surface and subsurface soils as a result of on-Site construction and excavation activities. On-Site construction workers potentially could ingest, inhale or have dermal contact with exposed impacted soil and fill. Similarly, off-Site receptors could be exposed to dust and vapors from on-Site activities. Due to the depth of groundwater, direct contact with groundwater is not expected. During construction, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through the Soil/Materials Management Plan, dust controls, and through the implementation of the Community Air-Monitoring Program and a Construction Health and Safety Plan.

*Proposed Future Conditions:* Under future remediated conditions, all soils in excess of Track 2 SCOs will be removed. The site will be fully capped, preventing potential direct exposure to soil and groundwater remaining in place, and engineering controls (vapor barrier and active SSDS) will prevent any potential exposure due to inhalation by preventing soil vapor intrusion. The site is served by the public water supply, and groundwater is not used at the site. There are no plausible off-site pathways for oral, inhalation, or dermal exposure to contaminants derived from the site.

## **Overall Human Health Exposure Assessment**

There are no potential complete exposure pathways for the current site condition. There are potential complete exposure pathways that requires mitigation during implementation of the remedy. There are no complete exposure pathways under future conditions after the site is developed. This assessment takes into consideration the reasonably anticipated use of the site, which includes a residential structure, site-wide surface cover, and a subsurface vapor barrier and active sub-slab depressurization system for the building. Under current conditions, on-Site exposure pathways are limited by the site cap and lack of building structures. During remedial construction, on-Site and off-Site exposures to contaminated dust from historic fill material will be addressed through dust controls, and through the implementation of the Community Air Monitoring Program, the Soil/Materials Management Plan, and a Construction Health and Safety

Plan. Potential post-construction use of groundwater is not considered an option because groundwater in this area of New York City is not used as a potable water source. There are no surface waters in close proximity to the Site that could be impacted or threatened.

<b>Environmental Media &amp; Exposure Route</b>	<b>Human Exposure Assessment for Proposed Remedial Action</b>
Direct contact with surface and subsurface soils	<ul style="list-style-type: none"> <li>• There will be no direct contact with soil because the site will be completely covered with an engineered composite cover. Future contact with soil will be prevented by the implementation of a Site Management Plan and Soil and Materials Management Plan for any future ground intrusive work</li> </ul>
Ingestion of groundwater	<ul style="list-style-type: none"> <li>• The area is served by an upstate water supply and local groundwater is not being used for potable water supply. Groundwater use for potable supply onsite is prohibited by municipal law.</li> </ul>
Direct contact with groundwater	<ul style="list-style-type: none"> <li>• There is no direct contact with groundwater because the site will be completely covered with an engineered composite cover. Future contact with groundwater will be prevented by the implementation of a Site Management Plan and Soil and Materials Management Plan for any future ground intrusive work.</li> </ul>
Direct contact with soil vapor	<ul style="list-style-type: none"> <li>• Contact with soil vapor will be prevented with a soil vapor barrier and an active sub slab depressurization</li> </ul>

	system.
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## **5.0 Remedial Action Management**

### **5.1 Project Organization and Oversight**

Principal personnel who will participate in the remedial action include Chawinie Reilly; EBC Project Manager and Kevin Water EBC Field Operations Manager. The Professional Engineer (PE) and Qualified Environmental Professionals (QEP) for this project are Ariel Czemerinski P.E., AMC Engineering and Charles Sosik P.G. EBC.

### **5.2 Site Security**

Site access will be controlled by chain link or wooden construction fence, which will surround the property.

### **5.3 Work Hours**

The hours for operation of cleanup will comply with the NYC Department of Buildings construction code requirements or according to specific variances issued by that agency. The hours of operation will be conveyed to OER during the pre-construction meeting.

### **5.4 Construction Health and Safety Plan**

The Health and Safety Plan is included in Appendix 5. The Site Safety Coordinator will be Kevin Waters. Remedial work performed under this RAWP will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the remedial construction work will ensure that performance of work is in compliance with the HASP and applicable laws and regulations. The HASP pertains to remedial and invasive work performed at the Site until the issuance of the Notice of Completion.

All field personnel involved in remedial activities will participate in training required under 29 CFR 1910.120, such as 40-hour hazardous waste operator training and annual 8-hour refresher training. Site Safety Officer will be responsible for maintaining workers training records. Personnel entering any exclusion zone will be trained in the provisions of the HASP and will comply with all requirements of 29 CFR 1910.120. Site-specific training will be provided to field personnel. Additional safety training may be added depending on the tasks performed. Emergency telephone numbers will be posted at the site location before any remedial work begins. A safety meeting will be conducted before each shift begins. Topics to be discussed include task hazards and protective measures (physical, chemical, environmental); emergency procedures; PPE levels and other relevant safety topics. Meetings will be documented in a log book or specific form.

An emergency contact sheet with names and phone numbers is included in the CHASP. That document will define the specific project contacts for use in case of emergency.

## **5.5 Community Air Monitoring Plan**

Real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the exclusion zone or work area will be performed. Continuous monitoring will be performed for all ground intrusive activities and during the handling of contaminated or potentially contaminated media. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pit excavation or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be performed during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well bailing/purging, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park,

or adjacent to a school or residence. Exceedences of action levels observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the OER Project Manager and included in the Daily Report.

### **VOC Monitoring, Response Levels, and Actions**

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

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

All 15-minute readings must be recorded and be available for OER personnel to review.

Instantaneous readings, if any, used for decision purposes will also be recorded.

## **Particulate Monitoring, Response Levels, and Actions**

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

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m<sup>3</sup>) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m<sup>3</sup> above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m<sup>3</sup> above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m<sup>3</sup> of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for OER personnel to review.

### **5.6 Agency Approvals**

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

## **5.7 Site Preparation**

### **Pre-Construction Meeting**

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

### **Mobilization**

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

### **Utility Marker Layouts, Easement Layouts**

The presence of utilities and easements on the Site will be fully investigated prior to the performance of invasive work such as excavation or drilling under this plan by using, at a minimum, the One-Call System (811). Underground utilities may pose an electrocution, explosion, or other hazard during excavation or drilling activities. All invasive activities will be performed in compliance with applicable laws and regulations including NYC Building Code to assure safety. Utility companies and other responsible authorities will be contacted to locate and mark the locations, and a copy of the Mark-Out Ticket will be retained by the contractor prior to the start of drilling, excavation or other invasive subsurface operations. Overhead utilities may also be present within the anticipated work zones. Electrical hazards associated with drilling in the vicinity of overhead utilities will be prevented by maintaining a safe distance between overhead power lines and drill rig masts.

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

## **Dewatering**

Dewatering is not anticipated during remediation and construction.

## **Equipment and Material Staging**

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

## **Stabilized Construction Entrance**

Steps will be taken to ensure that trucks departing the site will not track soil, fill or debris off-Site. Such actions may include use of cleaned asphalt or concrete pads or use of stone or other aggregate-based egress paths between the truck inspection station and the property exit.

Measures will be taken to ensure that adjacent roadways will be kept clean of project related soils, fill and debris.

## **Truck Inspection Station**

An outbound-truck inspection station will be set up close to the Site exit. Before exiting the Site, trucks will be required to stop at the truck inspection station and will be examined for evidence of contaminated soil on the undercarriage, body, and wheels. Soil and debris will be removed. Brooms, shovels and clean water will be utilized for the removal of soil from vehicles and equipment, as necessary.

## **Extreme Storm Preparedness and Response Contingency Plan**

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

## **Storm Preparedness**

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

## **Storm Response**

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

discharged off site to adjacent properties, property owners and OER will be notified and corrective measure plan designed to remove and clean dislocated material will be submitted to OER and implemented following approval by OER and granting of site access by the property owner. Impacted offsite areas may require characterization based on site conditions, at the discretion of OER. If onsite petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYS DEC's spill hotline at DEC 800-457-7362 within statutory defined timelines. If the source of the spill is ongoing and can be identified, it should be stopped if this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYS DEC.

### **Storm Response Reporting**

A site inspection report will be submitted to OER at the completion of site inspection. An inspection report established by OER is available on OER's website ([www.nyc.gov/oer](http://www.nyc.gov/oer)) and will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the OER project manager and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number. Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the site; estimates of the volume of soil that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of onsite or offsite exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYS DEC; description of corrective actions; schedule for corrective actions. This report should be completed and submitted to OER project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

## **5.8 Traffic Control**

Drivers of trucks leaving the Site with soil/fill will be instructed to proceed without stopping in the vicinity of the Site to prevent neighborhood impacts. The planned route on local roads for trucks leaving the site is shown on Figure 10.

## **5.9 Demobilization**

Demobilization will include:

- As necessary, restoration of temporary access areas and areas that may have been disturbed to accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water management areas, and access area);
- Removal of sediment from erosion control measures and truck wash and disposal of materials in accordance with applicable laws and regulations;
- Equipment decontamination, and;
- General refuse disposal.

Equipment will be decontaminated and demobilized at the completion of all field activities. Investigation equipment and large equipment (e.g., soil excavators) will be washed at the truck inspection station as necessary. In addition, all investigation and remediation derived waste will be appropriately disposed.

## **5.10 Reporting and Record Keeping**

### **Daily reports**

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

- Project number and statement of the activities and an update of progress made and locations of excavation and other remedial work performed;
- Quantities of material imported and exported from the Site;
- Status of on-Site soil/fill stockpiles;

- A summary of all citizen complaints, with relevant details (basis of complaint; actions taken; etc.);
- A summary of CAMP results noting all excursions. CAMP data may be reported;
- Photograph of notable Site conditions and activities.

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

## **Record Keeping and Photo Documentation**

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

### **5.11 Complaint Management**

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

### **5.12 Deviations From The Remedial Action Work Plan**

All changes to the RAWP will be reported to, and approved by, the OER Project Manager and will be documented in daily reports and reported in the Remedial Action Report. The process to

be followed if there are any deviations from the RAWP will include a request for approval for the change from OER noting the following:

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

## **6.0 Remedial Action Report**

A Remedial Action Report (RAR) will be submitted to OER following implementation of the remedial action defined in this RAWP. The RAR will document that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The RAR will include:

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

- Full accounting of the disposal destination of all contaminated material removed from the Site. Documentation associated with disposal of all material will include transportation and disposal records, and letters approving receipt of the material;
- Account of the origin and required chemical quality testing for material imported onto the Site;
- Continue registration of the property with an E-Designation by the NYC Department of Buildings (if Track 1 remedial action is not achieved);
- The RAWP and Remedial Investigation Report will be included as appendices to the RAR;
- Reports and supporting material will be submitted in digital form and final PDF's will include bookmarks for each appendix.

## Remedial Action Report Certification

I, [name], am currently a registered professional engineer licensed by the State of New York. I performed professional engineering services and had primary direct responsibility for implementation of the remedial program for the [site name (address)] site, site number [VCP site number]. I certify to the following:

- I have reviewed this document, to which my signature and seal are affixed.
- Engineering Controls implemented during this remedial action were designed by me or a person under my direct supervision and achieve the goals established in the Remedial Action Work Plan for this site.
- The Engineering Controls constructed during this remedial action were professionally observed by me or by a person under my direct supervision and (1) are consistent with the Engineering Control design established in the Remedial action Work Plan and (2) are accurately reflected in the text and drawings for as-built design reported in this Remedial Action Report.
- The OER-approved Remedial Action Work Plan dated [date] and Stipulations in a letter dated [date] were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

Name

PE License Number

Signature

Date

PE Stamp

I, [name], am a Qualified Environmental Professional. I had primary direct responsibility for implementation of the remedial program for the [site name (address)] site, site number [VCP site number]. I certify to the following:

- The OER-approved Remedial Action Work Plan dated August 15, 2012 and Stipulations in a letter dated September 10, 2014 were implemented and that all requirements in those documents have been

substantively complied with. I certify that contaminated soil, fill, liquids or other material from the property were taken to facilities licensed to accept this material in full compliance with applicable laws and regulations.

QEP Name

QEP Signature

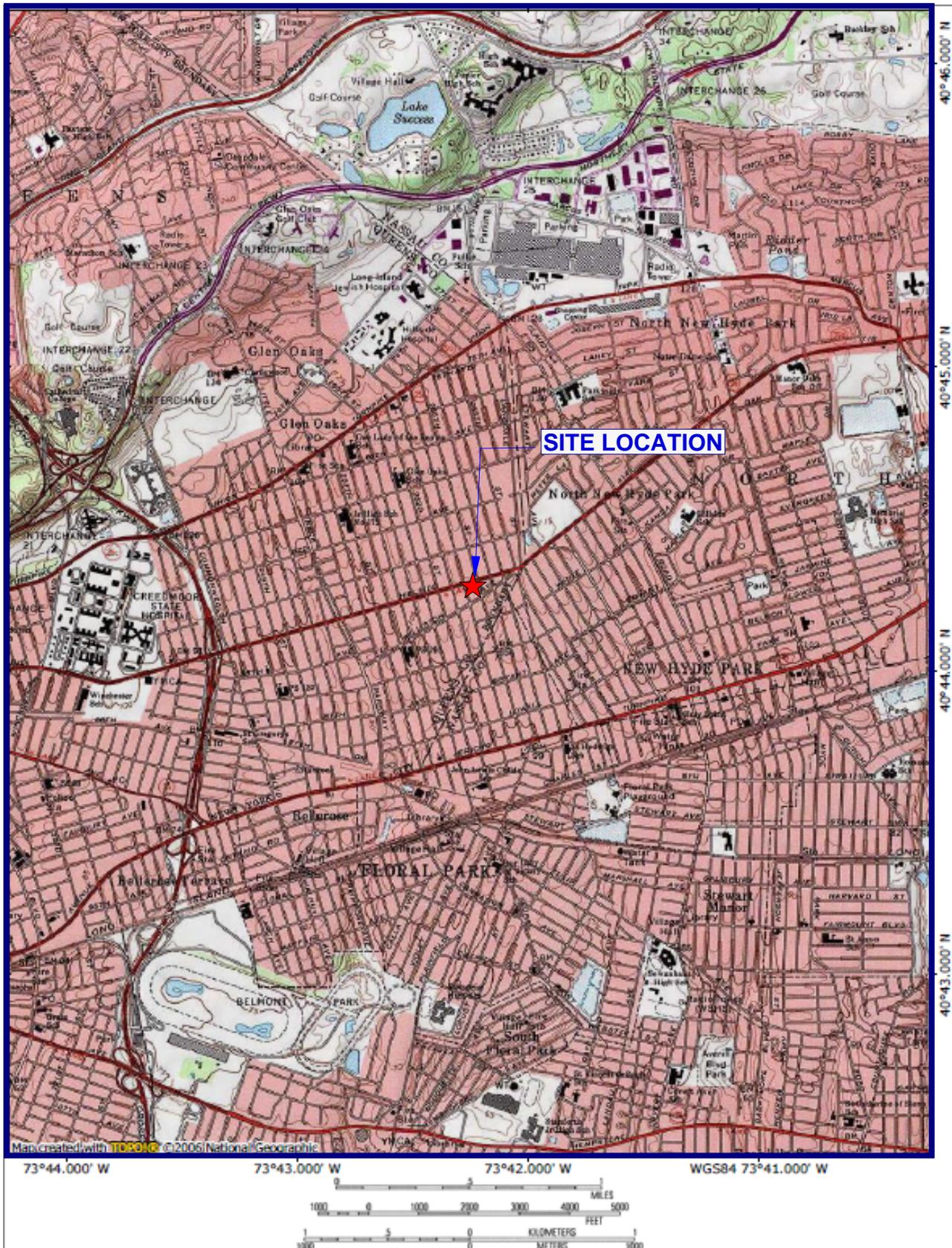
Date

## 7.0 Schedule

The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER. Currently, a 6 month remediation period is anticipated.

<b>Schedule Milestone</b>	<b>Weeks from Remedial Action Start</b>	<b>Duration (weeks)</b>
<b>OER Approval of RAWP</b>	<b>0</b>	<b>-</b>
<b>Fact Sheet 2 announcing start of remedy</b>	<b>0</b>	<b>-</b>
<b>Mobilization</b>	<b>1</b>	<b>1</b>
<b>Remedial Excavation</b>	<b>2</b>	<b>8</b>
<b>Demobilization</b>	<b>10</b>	<b>1</b>
<b>Submit Remedial Action Report</b>	<b>20</b>	<b>-</b>

## FIGURES



USGS Central Park Quadrangle 1995, Contour Interval = 10 feet



**ENVIRONMENTAL BUSINESS CONSULTANTS**

Phone 631.504.6000  
Fax 631.924.2870

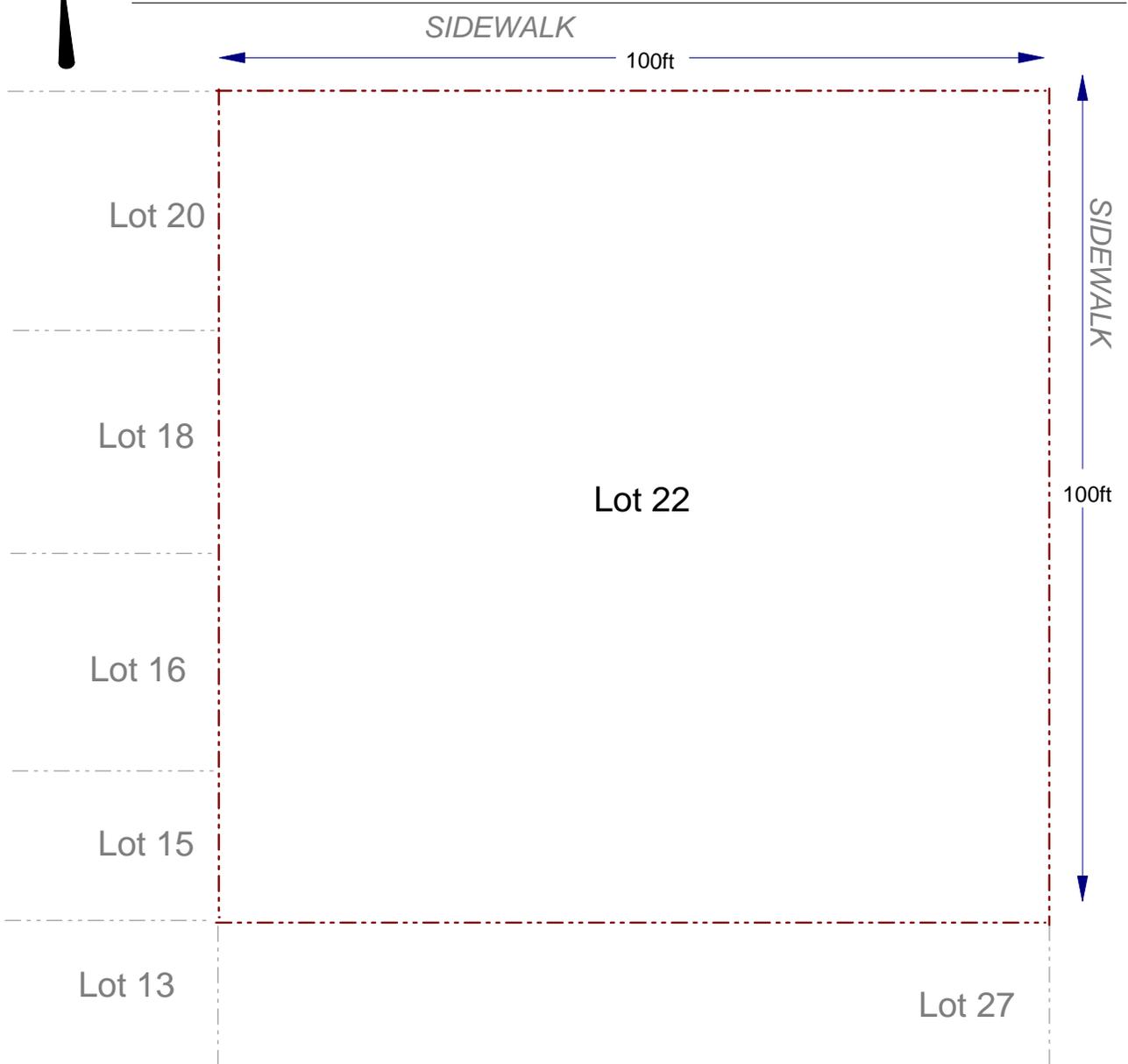
**264-12 HILLSIDE AVENUE  
QUEENS, NY**

**FIGURE 1**

**SITE LOCATION MAP**



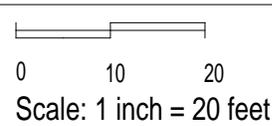
# HILLSIDE AVENUE



**KEY:**

 Property Boundary

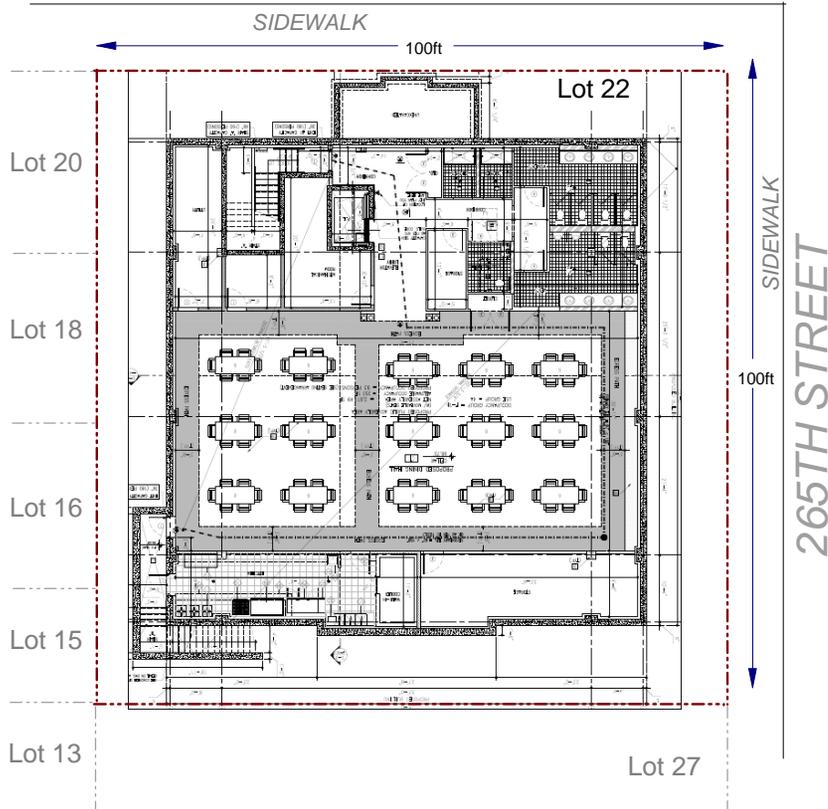
**SCALE:**





# CELLAR PLAN

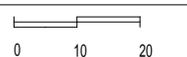
HILLSIDE AVENUE



KEY:

Property Boundary

SCALE:



Scale: 1 inch = 20 feet

# NORTH ELEVATION

(Not to Scale)

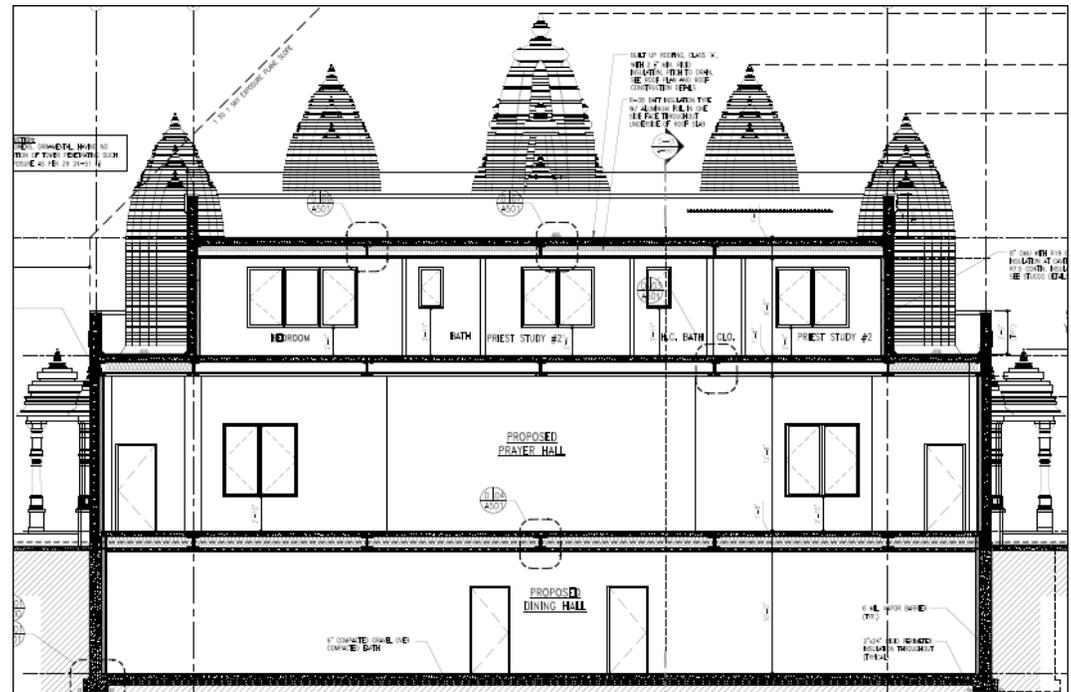
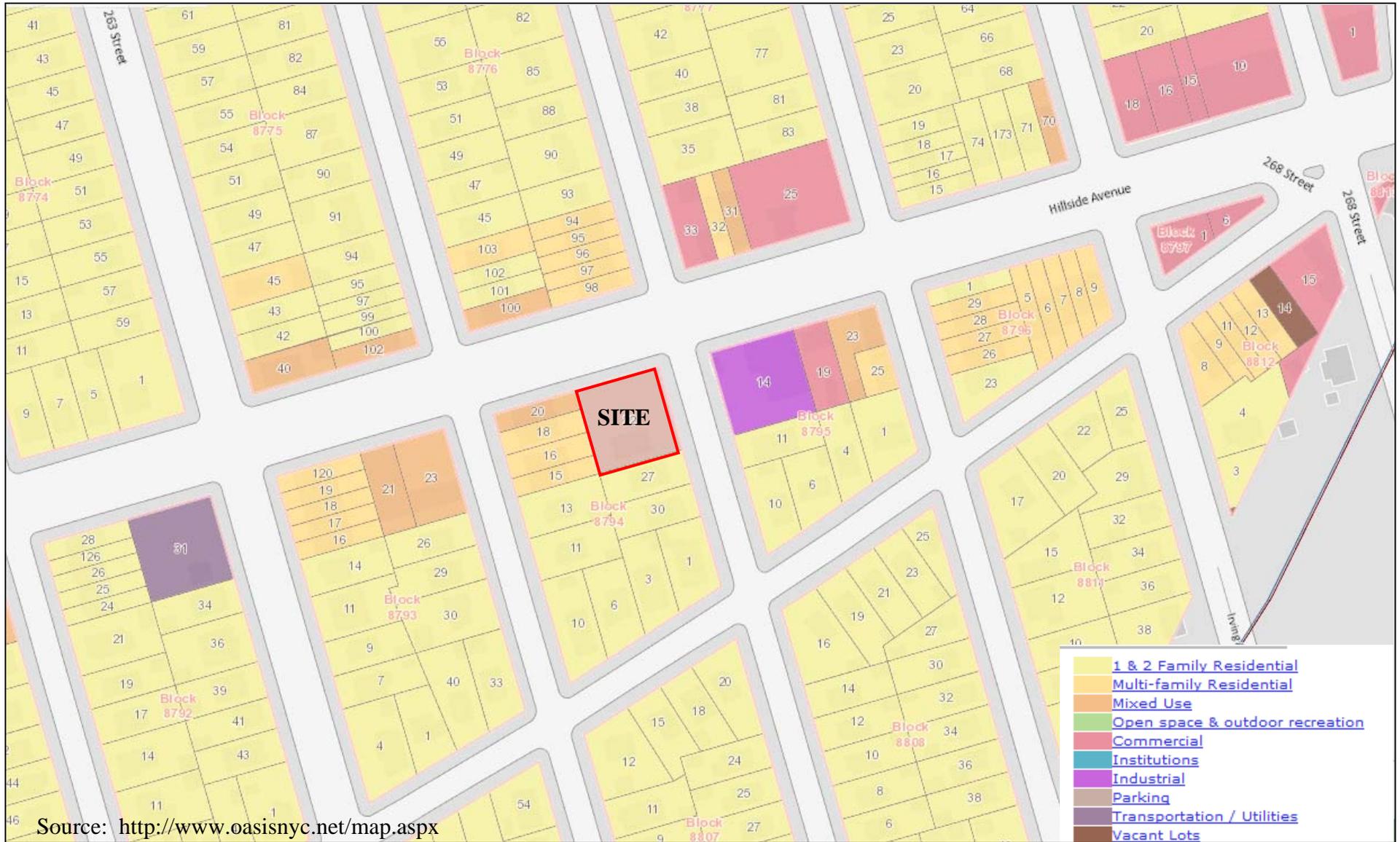


Figure No. 3

Site Name:	REDEVELOPMENT PROJECT
Site Address:	264-12 HILLSIDE AVENUE, QUEENS, NY
Drawing Title:	PROPOSED REDEVELOPMENT PLANS

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 Fax 631.924.2870



## FIGURE 4 SURROUNDING LAND USE MAP

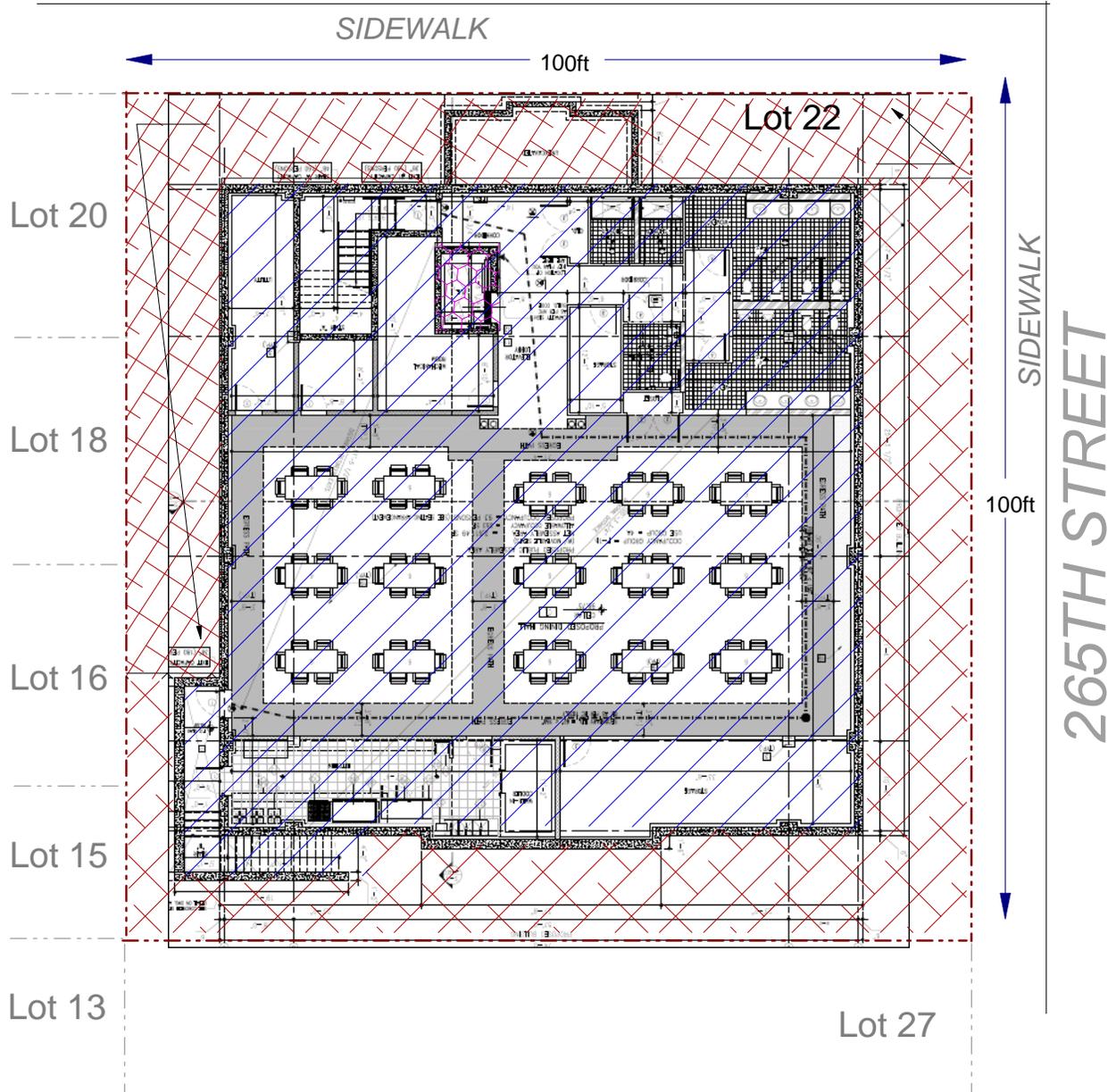
264-12 HILLSIDE AVENUE, QUEENS NY 11004  
HAZARDOUS MATERIALS REMEDIAL INVESTIGATION REPORT

**EBC**

**ENVIRONMENTAL BUSINESS CONSULTANTS**  
1808 MIDDLE COUNTRY ROAD, RIDGE, NEW YORK 11961  
PHONE: (631) 504-6000 FAX: (631) 924-2870



# HILLSIDE AVENUE



### KEY:

- Property Boundary
- Excavated to 13' Below Grade; Capped with 6 inches of Concrete
- Excavated to 18' Below Grade; capped with 6 Inches of Concrete
- Not Excavated and will be Capped with 6 Inches of Concrete or 2 Feet of Clean Soil and Landscaped

### SCALE:

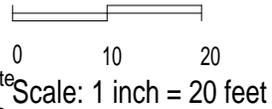


Figure No. **5**

Site Name: **REDEVELOPMENT PROJECT**  
 Site Address: **264-12 HILLSIDE AVENUE, QUEENS, NY**  
 Drawing Title: **EXCAVATION & CAPPING PLAN**

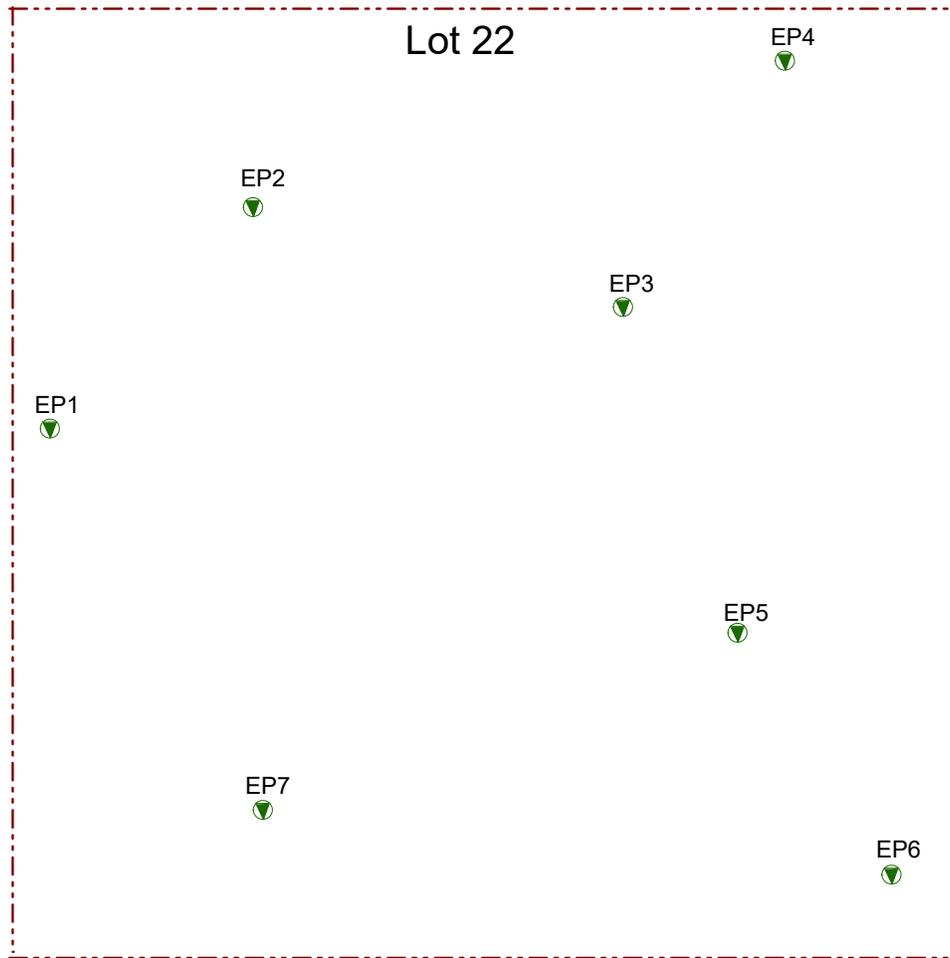
# HILLSIDE AVENUE

265TH STREET

SIDEWALK

SIDEWALK

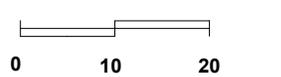
Lot 22



**KEY:**

-  Property Boundary
-  Soil Boring Location

**SCALE:**



Scale: 1 inch = 20 feet



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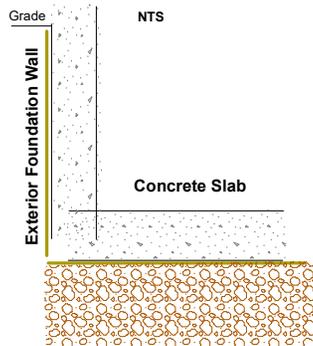
Figure No.  
**6**

Site Name: **Redevelopment Project**

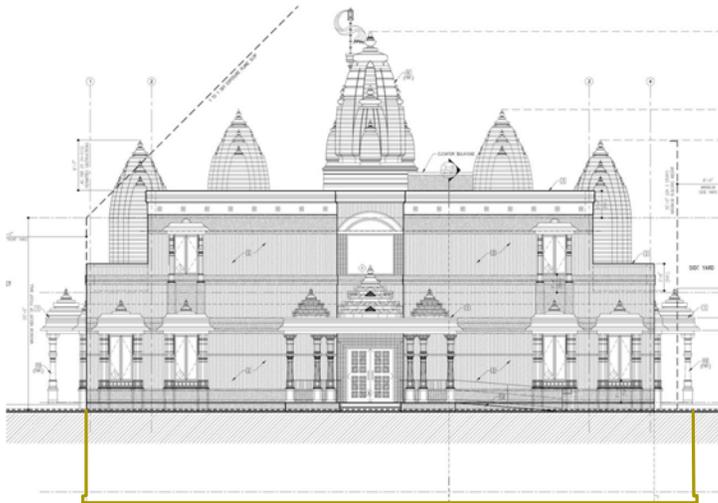
Site Address: **264 Hillside Avenue, Queens, NY**

Drawing Title: **Endpoint Sampling Map**

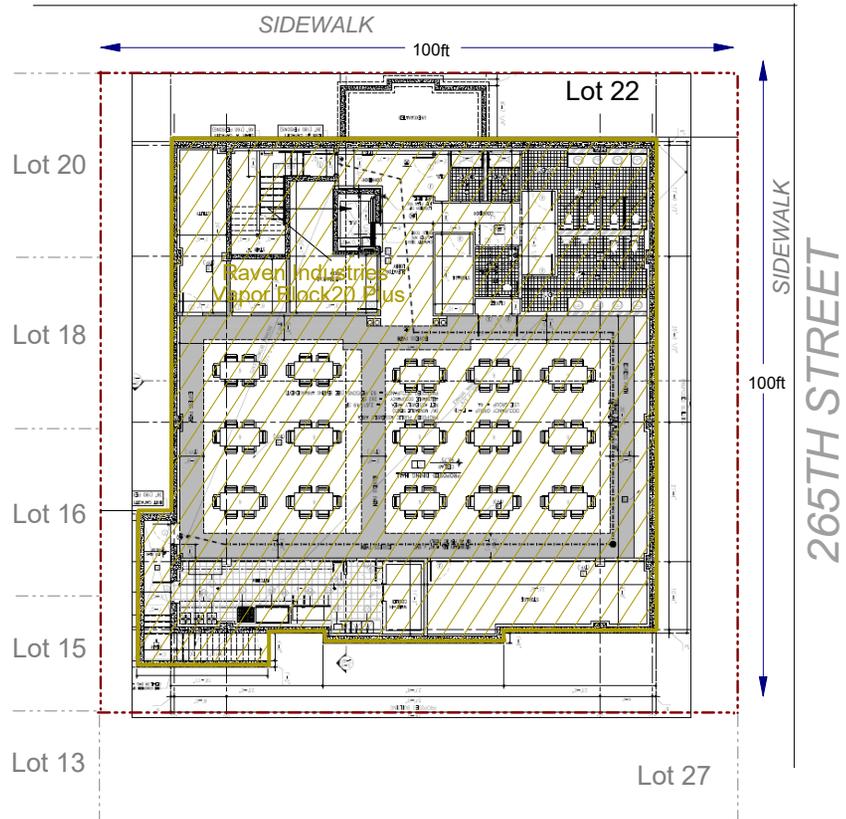
**Detail A**



**Detail B**



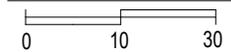
# HILLSIDE AVENUE



**KEY:**

- Property Boundary
- Vapor Block20 Plus
- Vapor Barrier

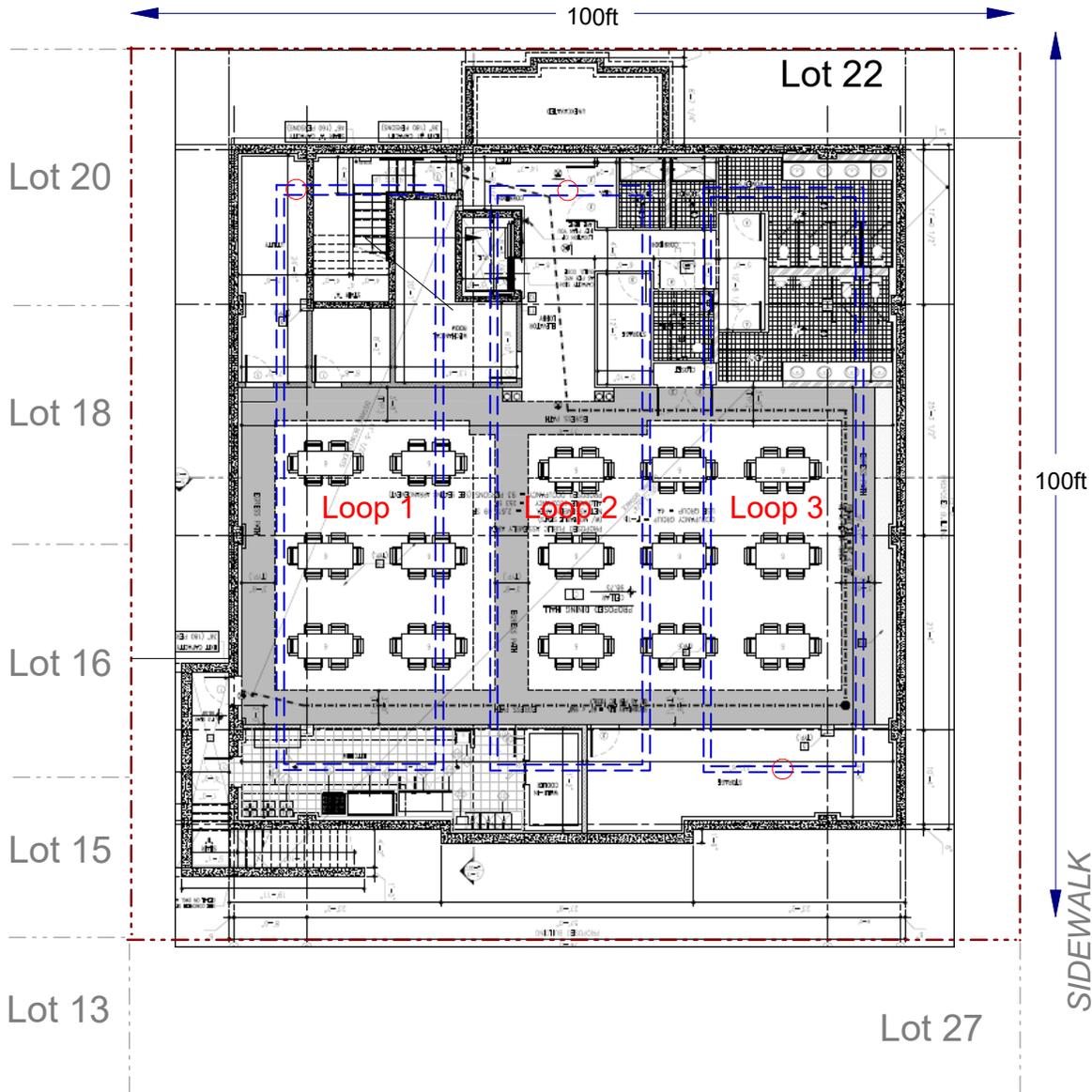
**SCALE:**



Scale: 1 inch = 30 feet

# HILLSIDE AVENUE

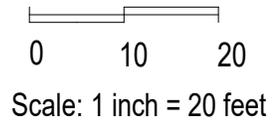
SIDEWALK

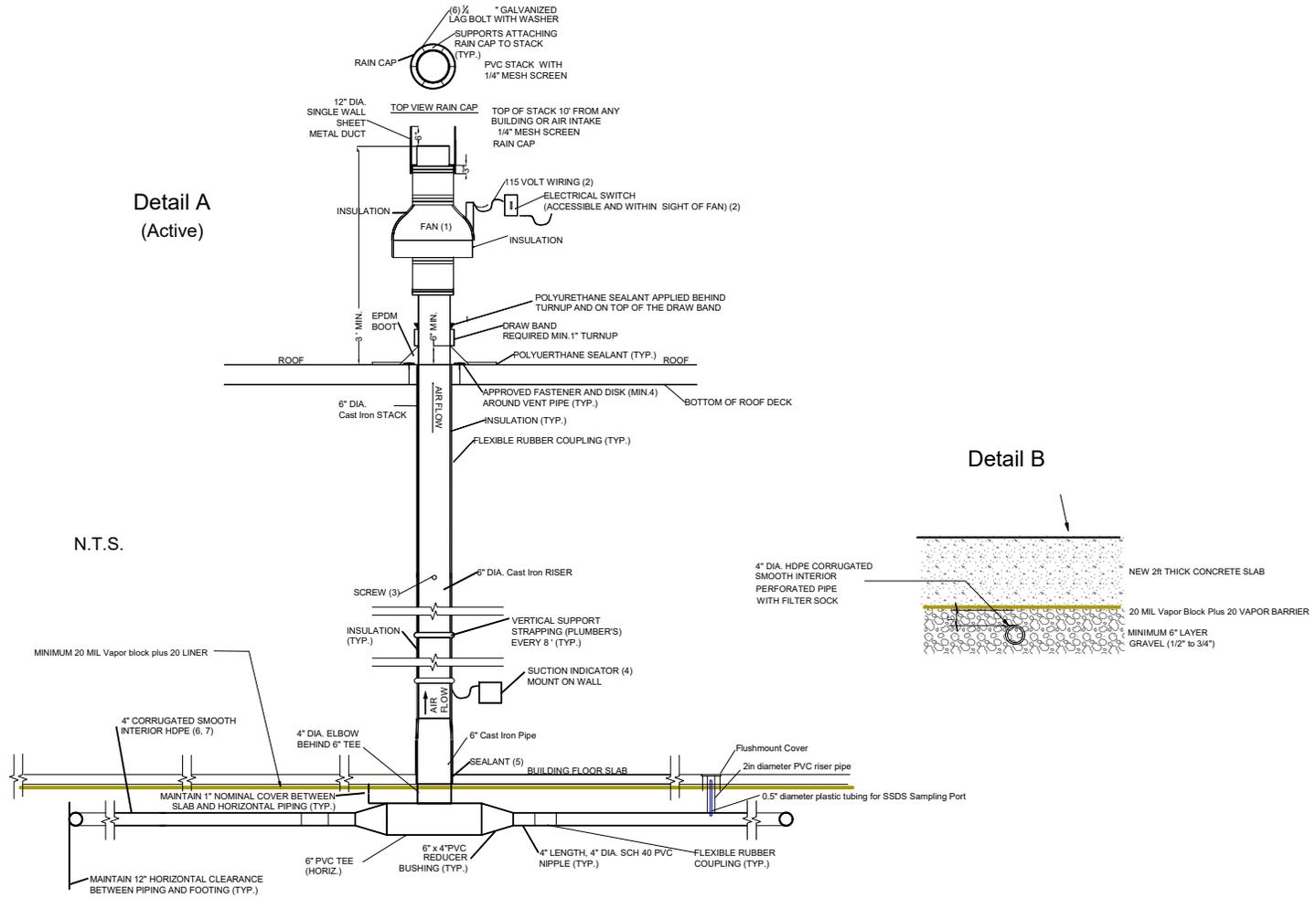


**KEY:**

- Property Boundary
- SSDS Sampling Port at Grade
- 4" diameter HDPE Perforated Vent Pipe (Smooth Interior)

**SCALE:**





Detail A  
(Active)

N.T.S.

Detail B

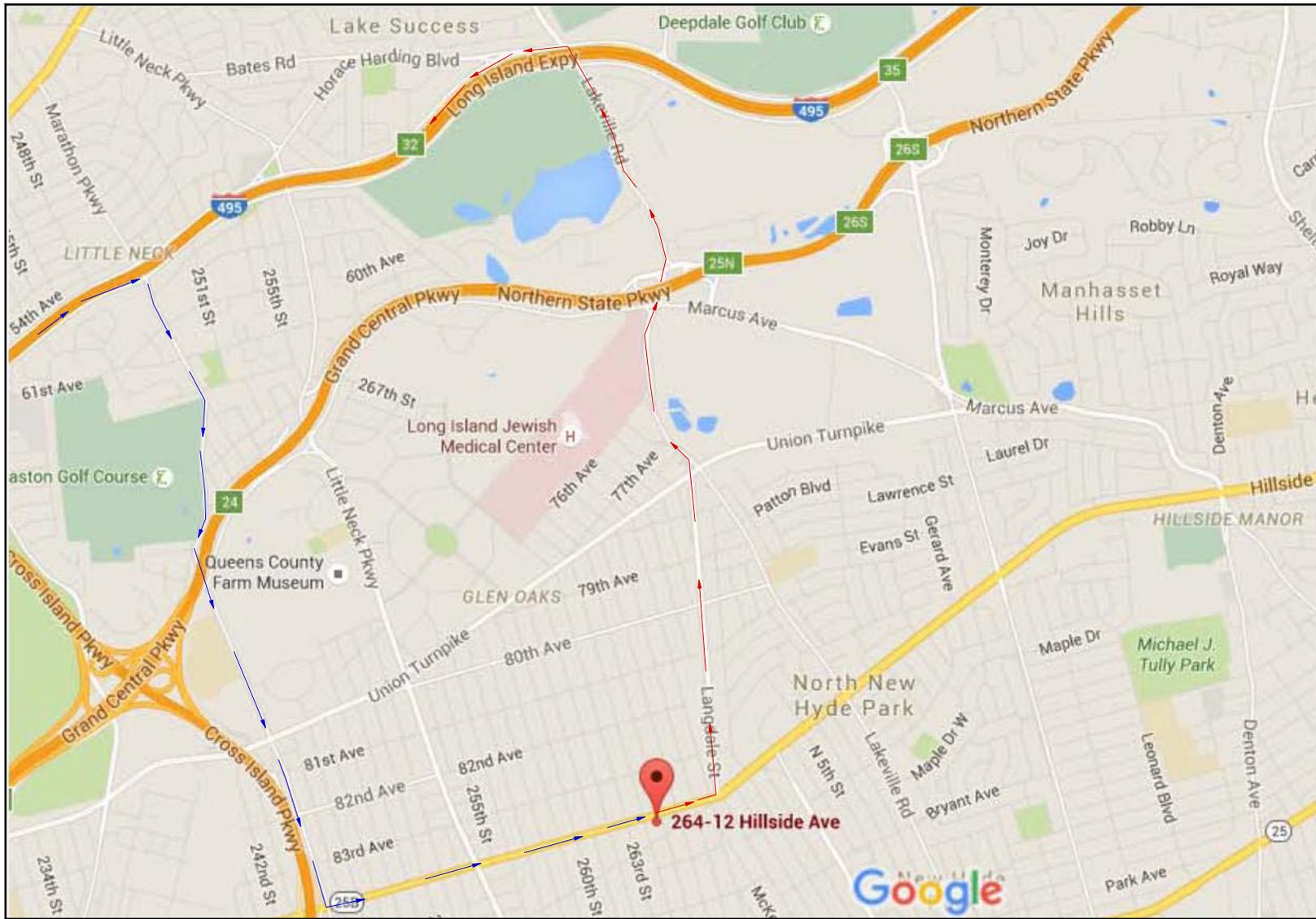
- NOTES:**
1. FAN TO BE RADONAWAY HIGH-FLOW IN-LINE FAN, MODEL RP 265, OR APPROVED EQUAL.
  2. FAN AND ON/OFF SWITCH TO BE HARD-WIRED TOGETHER TO 115 VOLT CIRCUIT.
  3. SECURE RUBBER COUPLING WITH SCREW TO PREVENT FAN ASSEMBLY FROM SLIPPING DOWN VERTICAL PIPE.
  4. DWYER MAGNETIC DIAL TYPE VACUUM GAUGE MODEL 2002-M OR APPROVED EQUAL.
  5. SEAL OPENING WITH ELASTOMERIC JOINT SEALANT AS DEFINED IN ASTM C920.
  6. HIGH DENSITY POLYETHYLENE CORRUGATED PERFORATED PIPE ADS N-12 OR APPROVED EQUAL.
  7. WRAP 4 HDPE PIPE WITH GEOTEXTILE FABRIC, GSE NW4 OR APPROVED EQUAL.
  8. EBC MUST PRE-APPROVE ALL FILLMATERIAL BEFORE DELIVERY TO SITE.

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Figure No.  
**9**

Site Name:	REDEVELOPMENT PROJECT
Site Address:	264-12 HILLSIDE AVENUE, QUEENS, NY
Drawing Title:	ACTIVE SSDS DETAILS



**Key:**

-  Route to the Site
-  Route from the Site

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**Figure No.**  
**10**

Site Name:	REDEVELOPMENT PROJECT
Site Address:	264-12 HILLSIDE AVENUE, QUEENS, NY
Drawing Title:	TRUCK ROUTE

## **TABLES**

**TABLE 1**  
**Soil Cleanup Objectives**

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
<b>METALS</b>							
Arsenic	7440-38 -2	16 <sub>f</sub>	16 <sub>f</sub>	16 <sub>f</sub>	16 <sub>f</sub>	13 <sub>f</sub>	16 <sub>f</sub>
Barium	7440-39 -3	350 <sub>f</sub>	400	400	10,000 <sub>d</sub>	433	820
Beryllium	7440-41 -7	14	72	590	2,700	10	47
Cadmium	7440-43 -9	2.5 <sub>f</sub>	4.3	9.3	60	4	7.5
Chromium, hexavalent <sub>h</sub>	18540-29-9	22	110	400	800	1 <sub>e</sub>	19
Chromium, trivalent <sub>h</sub>	16065-83-1	36	180	1,500	6,800	41	NS
Copper	7440-50 -8	270	270	270	10,000 <sub>d</sub>	50	1,720
Total Cyanide <sub>h</sub>		27	27	27	10,000 <sub>d</sub>	NS	40
Lead	7439-92 -1	400	400	1,000	3,900	63 <sub>f</sub>	450
Manganese	7439-96 -5	2,000 <sub>f</sub>	2,000 <sub>f</sub>	10,000 <sub>d</sub>	10,000 <sub>d</sub>	1600 <sub>f</sub>	2,000 <sub>f</sub>
Total Mercury		0.81 <sub>j</sub>	0.81 <sub>j</sub>	2.8 <sub>j</sub>	5.7 <sub>j</sub>	0.18 <sub>f</sub>	0.73
Nickel	7440-02 -0	140	310	310	10,000 <sub>d</sub>	30	130
Selenium	7782-49 -2	36	180	1,500	6,800	3.9 <sub>f</sub>	4 <sub>f</sub>
Silver	7440-22 -4	36	180	1,500	6,800	2	8.3
Zinc	7440-66 -6	2200	10,000 <sub>d</sub>	10,000 <sub>d</sub>	10,000 <sub>d</sub>	109 <sub>f</sub>	2,480
<b>PESTICIDES / PCBs</b>							
2,4,5-TP Acid (Silvex)	93-72-1	58	100 <sub>a</sub>	500 <sub>b</sub>	1,000 <sub>c</sub>	NS	3.8
4,4'-DDE	72-55-9	1.8	8.9	62	120	0.0033 <sub>e</sub>	17
4,4'-DDT	50-29-3	1.7	7.9	47	94	0.0033 <sub>e</sub>	136
4,4'-DDD	72-54-8	2.6	13	92	180	0.0033 <sub>e</sub>	14
Aldrin	309-00-2	0.019	0.097	0.68	1.4	0.14	0.19
alpha-BHC	319-84-6	0.097	0.48	3.4	6.8	0.04 <sub>g</sub>	0.02
beta-BHC	319-85-7	0.072	0.36	3	14	0.6	0.09
Chlordane (alpha)	5103-71 -9	0.91	4.2	24	47	1.3	2.9
delta-BHC	319-86-8	100 <sub>a</sub>	100 <sub>a</sub>	500 <sub>b</sub>	1,000 <sub>c</sub>	0.04 <sub>g</sub>	0.25
Dibenzofuran	132-64-9	14	59	350	1,000 <sub>c</sub>	NS	210
Dieldrin	60-57-1	0.039	0.2	1.4	2.8	0.006	0.1
Endosulfan I	959-98-8	4.8 <sub>i</sub>	24 <sub>i</sub>	200 <sub>i</sub>	920 <sub>i</sub>	NS	102
Endosulfan II	33213-65-9	4.8 <sub>i</sub>	24 <sub>i</sub>	200 <sub>i</sub>	920 <sub>i</sub>	NS	102
Endosulfan sulfate	1031-07 -8	4.8 <sub>i</sub>	24 <sub>i</sub>	200 <sub>i</sub>	920 <sub>i</sub>	NS	1,000 <sub>c</sub>
Endrin	72-20-8	2.2	11	89	410	0.014	0.06
Heptachlor	76-44-8	0.42	2.1	15	29	0.14	0.38
Lindane	58-89-9	0.28	1.3	9.2	23	6	0.1
Polychlorinated biphenyls	1336-36 -3	1	1	1	25	1	3.2
<b>SEMI-VOLATILES</b>							
Acenaphthene	83-32-9	100 <sub>a</sub>	100 <sub>a</sub>	500 <sub>b</sub>	1,000 <sub>c</sub>	20	98
Acenaphthylene	208-96-8	100 <sub>a</sub>	100 <sub>a</sub>	500 <sub>b</sub>	1,000 <sub>c</sub>	NS	107
Anthracene	120-12-7	100 <sub>a</sub>	100 <sub>a</sub>	500 <sub>b</sub>	1,000 <sub>c</sub>	NS	1,000 <sub>c</sub>
Benz(a)anthracene	56-55-3	1 <sub>f</sub>	1 <sub>f</sub>	5.6	11	NS	1 <sub>f</sub>
Benzo(a)pyrene	50-32-8	1 <sub>f</sub>	1 <sub>f</sub>	1 <sub>f</sub>	1.1	2.6	22
Benzo(b) fluoranthene	205-99-2	1 <sub>f</sub>	1 <sub>f</sub>	5.6	11	NS	1.7
Benzo(g,h,i) perylene	191-24-2	100 <sub>a</sub>	100 <sub>a</sub>	500 <sub>b</sub>	1,000 <sub>c</sub>	NS	1,000 <sub>c</sub>
Benzo(k) fluoranthene	207-08-9	1	3.9	56	110	NS	1.7
Chrysene	218-01-9	1 <sub>f</sub>	3.9	56	110	NS	1 <sub>f</sub>
Dibenz(a,h) anthracene	53-70-3	0.33 <sub>e</sub>	0.33 <sub>e</sub>	0.56	1.1	NS	1,000 <sub>c</sub>
Fluoranthene	206-44-0	100 <sub>a</sub>	100 <sub>a</sub>	500 <sub>b</sub>	1,000 <sub>c</sub>	NS	1,000 <sub>c</sub>
Fluorene	86-73-7	100 <sub>a</sub>	100 <sub>a</sub>	500 <sub>b</sub>	1,000 <sub>c</sub>	30	386
Indeno(1,2,3-cd) pyrene	193-39-5	0.5 <sub>f</sub>	0.5 <sub>f</sub>	5.6	11	NS	8.2
m-Cresol	108-39-4	100 <sub>a</sub>	100 <sub>a</sub>	500 <sub>b</sub>	1,000 <sub>c</sub>	NS	0.33 <sub>e</sub>
Naphthalene	91-20-3	100 <sub>a</sub>	100 <sub>a</sub>	500 <sub>b</sub>	1,000 <sub>c</sub>	NS	12
o-Cresol	95-48-7	100 <sub>a</sub>	100 <sub>a</sub>	500 <sub>b</sub>	1,000 <sub>c</sub>	NS	0.33 <sub>e</sub>
p-Cresol	106-44-5	34	100 <sub>a</sub>	500 <sub>b</sub>	1,000 <sub>c</sub>	NS	0.33 <sub>e</sub>
Pentachlorophenol	87-86-5	2.4	6.7	6.7	55	0.8 <sub>e</sub>	0.8 <sub>e</sub>
Phenanthrene	85-01-8	100 <sub>a</sub>	100 <sub>a</sub>	500 <sub>b</sub>	1,000 <sub>c</sub>	NS	1,000 <sub>c</sub>
Phenol	108-95-2	100 <sub>a</sub>	100 <sub>a</sub>	500 <sub>b</sub>	1,000 <sub>c</sub>	30	0.33 <sub>e</sub>
Pyrene	129-00-0	100 <sub>a</sub>	100 <sub>a</sub>	500 <sub>b</sub>	1,000 <sub>c</sub>	NS	1,000 <sub>c</sub>

**TABLE 1**  
**Soil Cleanup Objectives**

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted-Residential	Commercial	Industrial		
<b>VOLATILES</b>							
1,1,1-Trichloroethane	71-55-6	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>	NS	0.68
1,1-Dichloroethane	75-34-3	19	26	240	480	NS	0.27
1,1-Dichloroethene	75-35-4	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>	NS	0.33
1,2-Dichlorobenzene	95-50-1	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>	NS	1.1
1,2-Dichloroethane	107-06-2	2.3	3.1	30	60	10	0.02 <sup>d</sup>
cis-1,2-Dichloroethene	156-59-2	59	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>	NS	0.25
trans-1,2-Dichloroethene	156-60-5	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>	NS	0.19
1,3-Dichlorobenzene	541-73-1	17	49	280	560	NS	2.4
1,4-Dichlorobenzene	106-46-7	9.8	13	130	250	20	1.8
1,4-Dioxane	123-91-1	9.8	13	130	250	0.1 <sup>e</sup>	0.1 <sup>e</sup>
Acetone	67-64-1	100 <sup>a</sup>	100 <sup>b</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>	2.2	0.05
Benzene	71-43-2	2.9	4.8	44	89	70	0.06
Butylbenzene	104-51-8	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>	NS	12
Carbon tetrachloride	56-23-5	1.4	2.4	22	44	NS	0.76
Chlorobenzene	108-90-7	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>	40	1.1
Chloroform	67-66-3	10	49	350	700	12	0.37
Ethylbenzene	100-41-4	30	41	390	780	NS	1
Hexachlorobenzene	118-74-1	0.33 <sup>e</sup>	1.2	6	12	NS	3.2
Methyl ethyl ketone	78-93-3	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>	100 <sup>a</sup>	0.12
Methyl tert-butyl ether	1634-04 -4	62	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>	NS	0.93
Methylene chloride	75-09-2	51	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>	12	0.05
n-Propylbenzene	103-65-1	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>	NS	3.9
sec-Butylbenzene	135-98-8	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>	NS	11
tert-Butylbenzene	98-06-6	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>	NS	5.9
Tetrachloroethene	127-18-4	5.5	19	150	300	2	1.3
Toluene	108-88-3	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>	36	0.7
Trichloroethene	79-01-6	10	21	200	400	2	0.47
1,2,4-Trimethylbenzene	95-63-6	47	52	190	380	NS	3.6
1,3,5-Trimethylbenzene	108-67-8	47	52	190	380	NS	8.4
Vinyl chloride	75-01-4	0.21	0.9	13	27	NS	0.02
Xylene (mixed)	1330-20 -7	100 <sup>a</sup>	100 <sup>a</sup>	500 <sup>b</sup>	1,000 <sup>c</sup>	0.26	1.6

All soil cleanup objectives (SCOs) are in parts per million (ppm). NS=Not specified. See Technical Support Document (TSD). Footnotes

a The SCOs for residential, restricted-residential and ecological resources use were capped at a maximum value of 100 ppm. See TSD section 9.3.

b The SCOs for commercial use were capped at a maximum value of 500 ppm. See TSD section 9.3.

c The SCOs for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm. See TSD section 9.3.

d The SCOs for metals were capped at a maximum value of 10,000 ppm. See TSD section 9.3.

e For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the SCO value.

**APPENDIX 1**  
**PROPOSED DEVELOPMENT**  
**PLANS**

# TEMPLE

## SHIV SHAKTI PEETH TEMPLE

### ARCHITECT

M.S. SAVANI ARCHITECT, PC  
148-45, HILLSIDE AVENUE  
SUITE 201  
JAMAICA, NY 11435  
TEL: 718.657.6222  
FAX: 718.657.6226  
mss@mssarch.com

### STRUCTURAL

### MEP/FA/FPP/FS

### GEOTECH

### SOE

### DRAWING INDEX

#### ARCHITECTURAL:

Z-100	COVER SHEET
Z-101	SITE PLAN, ZONING CALCULATION, STATEMENTS AND NOTES
Z-102	NOTES, SETBACKS AND TRAVEL DISTANCES DIAGRAMS
Z-103	ZONING FLOOR AREA DIAGRAMS AND CALCULATIONS
C-100	ARCHITECTURAL SURVEY, ZONING, FEMA MAPS, AND BORING TEST RESULT
EN-100	STREET TREE PLANTING DETAILS, NOTES AND SITE DETAILS
EN-101	ENERGY ANALYSIS FOR BUILDING ENVELOPE - COMCHECK, & ENVELOPE SECTIONS
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A-100	FOUNDATION PLAN
A-101	CELLAR PLAN
A-102	FIRST FLOOR PLAN
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A-201	NORTH SIDE ELEVATION
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A-301	SECTION 'A'
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A-800	ADA DETAILS & NOTES
A-801	ADA DETAILS & NOTES
A-900	GENERAL NOTES
A-901	GENERAL NOTES
A-902	GENERAL NOTES

#### STRUCTURAL:

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#### MEP, SPRINKLER:

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ENERGY ANALYSIS FOR BUILDING ENVELOPE – COMCHECK

**COMcheck Software Version 4.0.0**  
**Envelope Compliance Certificate**

**Project Information**

Energy Code: 2014 New York Energy Conservation Construction Code  
 Project Title: HOUSE OF WORSHIP - HINDU TEMPLE  
 Location: QUEENS COUNTY, NEW YORK  
 Climate Zone: 4a  
 Project Type: New Construction  
 Vertical Glazing / Wall Area: 6%  
 Skylight / Roof Area: 1%

Construction Site: 264-16 HILLSIDE AVRM QUEENS, NY 11004  
 Owner/Agent: SHIV SHAKTI PEETH  
 Designer/Contractor: MANISH SAVANI M.S. SAVANI ARCHITECT, P.C. 148-45 HILLSIDE ACVENUE SUITE 201 JAMAICA, NY 11435

Building Area	Floor Area
1-Religious building - Nonresidential	13696

**Additional Efficiency Package**

High efficiency HVAC. Systems that do not meet the performance requirement will be identified in the mechanical requirements checklist report.

**Envelope Assemblies**

Assembly	Gross Area of Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor <sub>req</sub>
NORTH WALL: Concrete Block 8" Solid Grouted, Normal Density, Furring: Metal, [Bldg. Use 1 - Religious building]	1717	13.0	7.5	0.068	0.104
WINDOWS: Metal Frame with Thermal Break-Operable, Perf. Specs.: Product ID NA, SHGC 0.40, [Bldg. Use 1 - Religious building] (b)	105	---	---	0.380	0.550
DOORS: Insulated Metal, Swinging, [Bldg. Use 1 - Religious building]	42	---	---	0.340	0.700
EAST WALL: Concrete Block 8" Solid Grouted, Normal Density, Furring: Metal, [Bldg. Use 1 - Religious building]	1816	13.0	7.5	0.068	0.104
WINDOWS: Metal Frame with Thermal Break-Operable, Perf. Specs.: Product ID NA, SHGC 0.40, [Bldg. Use 1 - Religious building] (b)	102	---	---	0.380	0.550
DOOR: Insulated Metal, Swinging, [Bldg. Use 1 - Religious building]	21	---	---	0.340	0.700
SOUTH WALL: Concrete Block 8" Solid Grouted, Normal Density, Furring: Metal, [Bldg. Use 1 - Religious building]	1717	13.0	7.5	0.068	0.104
WINDOWS: Metal Frame with Thermal Break-Operable, Perf. Specs.: Product ID NA, SHGC 0.40, [Bldg. Use 1 - Religious building] (b)	131	---	---	0.380	0.550
DOOR: Insulated Metal, Swinging, [Bldg. Use 1 - Religious building]	84	---	---	0.340	0.700
WEST WALL: Concrete Block 8" Solid Grouted, Normal Density, Furring: Metal, [Bldg. Use 1 - Religious building]	1816	13.0	7.5	0.068	0.104
WINDOWS: Metal Frame with Thermal Break-Operable, Perf. Specs.: Product ID NA, SHGC 0.40, [Bldg. Use 1 - Religious building] (b)	21	---	---	0.380	0.550
DOOR: Insulated Metal, Swinging, [Bldg. Use 1 - Religious building]	84	---	---	0.340	0.700
ROOF: Insulation Entirely Above Deck, [Bldg. Use 1 - Religious building]	5592	---	38.0	0.026	0.048

Project Title: HOUSE OF WORSHIP - HINDU TEMPLE Report date: 06/29/15  
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Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor <sub>req</sub>
Skylights: Metal Frame with Thermal Break-Glass, With Curb, Perf. Specs.: Product ID NA, SHGC 0.40, [Bldg. Use 1 - Religious building] (b)	79	---	---	0.500	0.800
1 FLOOR: Steel Joist, [Bldg. Use 1 - Religious building]	5592	30.0	0.0	0.036	0.033
CELLAR SLAB: Slab-On-Grade Unheated, Horizontal with vertical >= 4 ft, [Bldg. Use 1 - Religious building] (c)	5285	---	10.0	0.182	0.182
FO NORTH: Solid Concrete-12" Thickness, Normal Density, Furring: Metal, Wall Ht 20.0, Depth B.G. 15.0, [Bldg. Use 1 - Religious building]	777	13.0	10.0	0.059	0.579
FO EAST: Solid Concrete-12" Thickness, Normal Density, Furring: Metal, Wall Ht 20.0, Depth B.G. 15.0, [Bldg. Use 1 - Religious building]	803	13.0	10.0	0.059	0.579
FO SOUTH: Solid Concrete-12" Thickness, Normal Density, Furring: Metal, Wall Ht 20.0, Depth B.G. 15.0, [Bldg. Use 1 - Religious building]	777	13.0	10.0	0.059	0.579
FO WEST: Solid Concrete-12" Thickness, Normal Density, Furring: Metal, Wall Ht 20.0, Depth B.G. 15.0, [Bldg. Use 1 - Religious building]	803	13.0	10.0	0.059	0.579

- (a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.
- (b) Fenestration product performance must be certified in accordance with NFRC and requires supporting documentation.
- (c) Slab-On-Grade proposed and budget U-factors shown in table are F-factors.

Envelope PASSES: Design 8% better than code

**Envelope Compliance Statement**

Compliance Statement: The proposed envelope design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed envelope systems have been designed to meet the 2014 New York Energy Conservation Construction Code requirements in COMcheck Version 4.0.0 and to comply with the mandatory requirements listed in the Inspection Checklist.

Name - Title Signature Date

Project Title: HOUSE OF WORSHIP - HINDU TEMPLE Report date: 06/29/15  
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**COMcheck Software Version 4.0.0**  
**Interior Lighting Compliance Certificate**

**Project Information**

Energy Code: 2014 New York Energy Conservation Construction Code  
 Project Title: HOUSE OF WORSHIP - HINDU TEMPLE  
 Project Type: New Construction

Construction Site: 264-16 HILLSIDE AVRM QUEENS, NY 11004  
 Owner/Agent: SHIV SHAKTI PEETH  
 Designer/Contractor: MANISH SAVANI M.S. SAVANI ARCHITECT, P.C. 148-45 HILLSIDE ACVENUE SUITE 201 JAMAICA, NY 11435

**Additional Efficiency Package**

High efficiency HVAC. Systems that do not meet the performance requirement will be identified in the mechanical requirements checklist report.

**Allowed Interior Lighting Power**

Area Category	B Floor Area (ft <sup>2</sup> )	C Allowed Watts / ft <sup>2</sup>	D Allowed Watts (B X C)
1-Religious building	13696	1.30	17805
		Total Allowed Watts =	17805

**Proposed Interior Lighting Power**

Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps / Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
1-Religious building				
L2 - LED: L2: LED A Lamp 6W:	1	228	9	2052
L3 - LED: L3: LED MR 6W:	1	7	6	42
L4 - LED: L4: LED Other Fixture Unit 40W:	2	19	64	1216
L5 - Compact Fluorescent: L5: BLAX 16W: Electronic:	1	35	18	630
L7 - LED: L7: LED Other Fixture Unit 16W:	1	35	15	525
		Total Proposed Watts =		4465

Interior Lighting PASSES: Design 75% better than code

**Interior Lighting Compliance Statement**

Compliance Statement: The proposed interior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2014 New York Energy Conservation Construction Code requirements in COMcheck Version 4.0.0 and to comply with the mandatory requirements listed in the Inspection Checklist.

Name - Title Signature Date

Project Title: HOUSE OF WORSHIP - HINDU TEMPLE Report date: 06/29/15  
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**COMcheck Software Version 4.0.0**  
**Exterior Lighting Compliance Certificate**

**Project Information**

Energy Code: 2014 New York Energy Conservation Construction Code  
 Project Title: HOUSE OF WORSHIP - HINDU TEMPLE  
 Project Type: New Construction  
 Exterior Lighting Zone: 3 (Other)

Construction Site: 264-16 HILLSIDE AVRM QUEENS, NY 11004  
 Owner/Agent: SHIV SHAKTI PEETH  
 Designer/Contractor: MANISH SAVANI M.S. SAVANI ARCHITECT, P.C. 148-45 HILLSIDE ACVENUE SUITE 201 JAMAICA, NY 11435

**Allowed Exterior Lighting Power**

Area/Surface Category	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B X C)
Other door (not main entry)	9 ft of door	20	Yes	180
		Total Tradable Watts (a) =		180
		Total Allowed Watts =		180
		Total Allowed Supplemental Watts (b) =		750

- (a) Wattage tradeoffs are only allowed between tradable areas/surfaces.
- (b) A supplemental allowance equal to 750 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

**Proposed Exterior Lighting Power**

Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps / Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Other door (not main entry) (9 ft of door width) Tradable Wattage				
L5 - LED: L5: LED Other Fixture Unit 50W:	1	14	50	700
L8 - LED: L8: LED Other Fixture Unit 6.5W:	1	12	9	108
		Total Tradable Proposed Watts =		808

Exterior Lighting PASSES: Design 13% better than code

**Exterior Lighting Compliance Statement**

Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed exterior lighting systems have been designed to meet the 2014 New York Energy Conservation Construction Code requirements in COMcheck Version 4.0.0 and to comply with the mandatory requirements listed in the Inspection Checklist.

Name - Title Signature Date

Project Title: HOUSE OF WORSHIP - HINDU TEMPLE Report date: 06/29/15  
 Data filename: Z:\1-MANISH\MSS-630-Shakti Peeth\CONSTRUCTION DOCUMENTS\COMCHECK\264-16 Hillside A Page 4 of 14  
 Envelope - COMCHECK.cck

BUILDING ENVELOPE MANDATORY PROVISIONS:

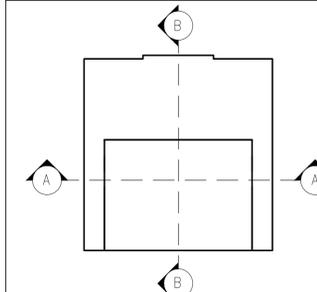
- BUILDING ENTRANCE DOORS AND OTHER EXTERIOR EXIT DOORS SHALL COMPLY WITH BC 1008.4.1.
- DOORS TO DWELLING UNITS SHALL COMPLY WITH BC 1008.4.2.
- ALL STAIRWAY EXIT DOOR SHALL COMPLY WITH BC 403.5.3.
- ALL EXTERIOR DOORS WILL BE FIELD-FITTED WITH WEATHERSTRIPPING PER ECC SECTION C402.4.4.
- AS PER NYCECC C402.4.3 COMMERCIAL ENTRANCE DOOR THE MAXIMUM AIR LEAKAGE RATE SHALL BE 1.00 cfm/ft<sup>2</sup> OF DOOR AREA WHEN TESTED IN ACCORDANCE WITH ASTM E 283.
- AS PER NYCECC C402.4.1 A CONTINUOUS AIR BARRIER SHALL BE INSTALLED: SEALING ALL SEAMS, OPENINGS AND PENETRATIONS OF THE BUILDING AND SHALL BE SEALED WITH CAULKING MATERIALS OR CLOSED WITH GASKETING SYSTEMS COMPATIBLE WITH THE CONSTRUCTION MATERIALS AND LOCATION.
- VESTIBULES' DOOR THAT SEPARATES CONDITIONED SPACE FROM THE EXTERIOR SHALL COMPLY WITH ECC SECTION C402.4.7.

LIGHTING NOTES

- PROVIDE INTERIOR LIGHT CONTROL FOR ALL ROOMS EITHER BY LIGHTING SWITCH AND/OR A OCCUPANCY SENSOR, EXCEPT FOR STAIRWAYS AND CORRIDORS.
- LIGHT REDUCTION CONTROLS FOR CORRIDORS, STAIRCASES, STORAGE ROOMS, WASHROOMS, PUBLIC LOBBY AND SLEEPING UNITS AREA EXEMPTED AS PER NYC ECC C405.2.1.2.
- ALL SLEEPING UNITS SHALL BE PROVIDED WITH A MASTER SWITCH AT PRIMARY ENTRY TO THE UNIT.
- ALL OUTDOOR FIXTURES SHALL BE PROVIDED WITH PHOTO SENSOR.
- ALL EXITS LIGHTS SHALL BE PROVIDED WITH LED LAMPS.
- DAYLIGHT ZONE CONTROL SHALL BE PROVIDED AT LOBBY INDEPENDENT OF GENERAL LIGHTING CONTROL IN COMPLIANCE WITH C405.2.2.3.
- DINING HALL AND VESTIBULE SHALL BE PROVIDED WITH AUTOMATIC LIGHTING SHUTOFF CONTROLS WITH MANUAL OVER RIDE.

BUILDING THERMAL BOUNDARY

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



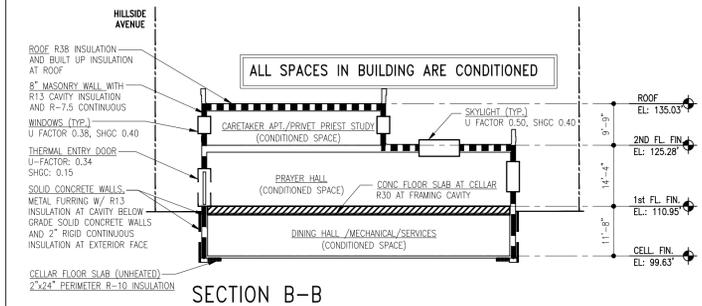
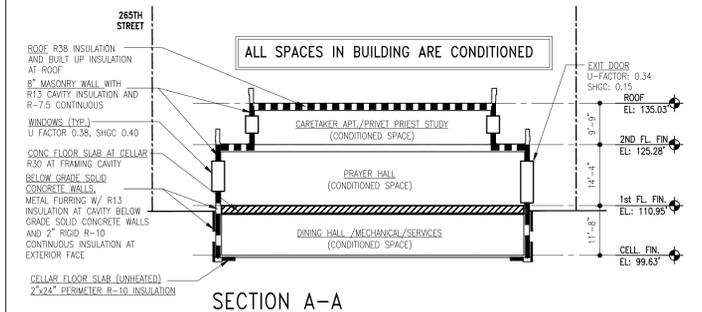
PROFESSIONAL STATEMENT

TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE NYCECC – NEW YORK CITY ENERGY CONSERVATION CODE 2014 – CHAPTER C4 .

CONSULTANTS:

STRUCTURAL:  
 MEP/FA/FFP/FS:  
 GEOTECH:

VERTICAL SECTIONS OF THERMAL ENVELOPE WITH LEGEND



LEGEND:

- ROOF R38 INSULATION AND BUILT UP INSULATION AT ROOF
- 8" MASONRY WALL WITH R19 CAVITY INSULATION
- ALUMINUM FRAME DOUBLE PANE WINDOWS, MAX U-FACTOR = 0.35, SHGC = 0.32, REFER TO WINDOW SCHEDULE.
- THERMAL ENTRY DOOR U-FACTOR: 0.35 SHGC: 0.32
- BELOW GRADE SOLID CONCRETE WALLS WITH 2" RIGID CONTINUOUS INSULATION AT EXTERIOR FACE OF FOUNDATION WALL AND FURRED PARTITION W/ R-13 BATT INSULATION AT CAVITY.
- R30 BATT INSULATION AT UNDERSIDE OF CELLAR METAL FLOOR SLAB.

ENVELOPE VALUE REFERENCES

ITEM DESCRIPTION	PROPOSED DESIGN VALUE	DRAWING REFERENCE
INSULATION ENTIRELY ABOVE DECK	PROVIDE R38 INSULATION	SECTIONS: A-300, A-301, AND A-400 DETAILS: A-500
MASS WALLS, ABOVE GRADE	PROVIDE R-7.5 CONTINUOUS INSULATION AND R-13 BATT CAVITY INSULATION	SECTIONS: A-300, A-301, AND A-400 DETAILS: A-503
MASS WALLS, BELOW GRADE	PROVIDE R-10 CONTINUOUS RIGID INSULATION AND R-13 BATT CAVITY INSULATION	SECTIONS: A-300, A-301, AND A-400 DETAILS: A-503
WINDOWS	PROVIDE U 0.45, SHGC 0.20	WINDOW SCHEDULE: A-602
ENTRANCE DOORS ALL OTHER	PROVIDE U 0.45, SHGC 0.20	DOOR SCHEDULE: A-600
CELLAR FLOOR SLAB (UNHEATED)	PROVIDE R10 INSULATION UNDER SLAB	SECTIONS: A-300, A-301, AND A-400 DETAILS: A-500
LIGHT FIXTURES	MAX. WATTS PER SQFT = 0.59 AT 1ST FLOOR.	REFLECTED CEILING PLANS: A-700 THRU A-702
EXIT SIGNS	PROVIDE 5 WATT EXIT SIGNS	REFLECTED CEILING PLANS: A-700 THRU A-702
EXTERIOR LIGHTING CONTROL	PROVIDE A COMBINATION OF PHOTO-SENSOR AND TIME SWITCH CONTROL	REFLECTED CEILING PLANS: A-700 THRU A-702, LIGHTING NOTES
INTERIOR LIGHTING CONTROL	MANUAL LIGHTING CONTROLS PROVIDED AT EACH ROOM.	REFLECTED CEILING PLANS: A-700 THRU A-702, LIGHTING NOTES
PTAC – COOLING MODE	PROVIDE 12.1 EER	FLOOR PLANS: A-100 THRU A-106 AND EQUIPMENT SCHEDULE ON DWG. A-100 (SEE MEP PLANS, JOB #421146566)

NO.	DATE	DESCRIPTION OF REVISION
06-24-15		AS PER DOB OBJECTIONS

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**Mss**  
**M.S. SAVANI ARCHITECT, PC**

148-45, HILLSIDE AVENUE  
 SUITE 201  
 JAMAICA, NY 11435  
 TEL: 718.657.6222  
 FAX: 718.657.6226  
 mss@mssarch.com

CLIENT:  
 SHIV SHAKTI PEETH  
 (HINDU TEMPLE)

DOB STAMP & SIGNATURE:

PROJECT:  
 PROPOSED 2-STY AND CELLAR TEMPLE W/  
 CARETAKER'S APARTMENT AND RECTORY  
 264-16 HILLSIDE AVENUE,  
 GLEN OAKS, NY 11004

TITLE:  
 ENERGY ANALYSIS FOR BUILDING  
 ENVELOPE – COMCHECK, AND  
 ENVELOPE SECTIONS

SEAL & SIGNATURE:  
 DATE: 10.16.14  
 PROJECT NO.: MSS-630  
 DRAWING BY: AC  
 CHK. BY: MSS  
 DWG. NO:  
**EN-100.00**  
 CAD FILE NO: 06 OF 37  
 Z: 1-MSS:

CONSULTANTS:

STRUCTURAL:

MEP/FA/PPP/FS:

GEOTECH:

06-24-15 AS PER DOB OBJECTIONS

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148-45, HILLSIDE AVENUE  
SUITE 201  
JAMAICA, NY 11435  
TEL: 718.657.6222  
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SHIV SHAKTI PEETH  
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PROJECT:  
PROPOSED 2-STY AND CELLAR TEMPLE W/  
CARETAKER'S APARTMENT AND RECTORY  
264-16 HILLSIDE AVENUE,  
GLEN OAKS, NY 11004

TITLE:  
ENERGY ANALYSIS,  
MECHANICAL AND PLUMBING  
- COMCHECK

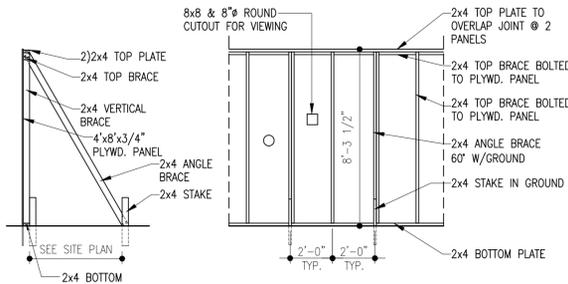
SEAL & SIGNATURE:

DATE: 10.16.14  
PROJECT NO.: MSS-630  
DRAWING BY: AC  
CHK. BY: MSS  
DWG NO:  
**EN-101.00**  
CAD FILE NO: 07 OF 37  
Z: 1-MSS

SUPPORTING DOCUMENT REFERENCE	
ITEM DESCRIPTION	DRAWINGS REFERENCE
GENERAL REQUIREMENT # 4: LOAD CALCULATION	UNIT SPECIFIED ON THE SCHEDULE M-200.00 ARE SELECTED BASED ON LOAD CALCULATION BY ASHRAE CLTD AND TRANSFER FUNCTION METHOD USING ASHRAE HVAC SYSTEMS AND EQUIPMENT HANDBOOK, CHAPTER 5 ENERGY CODE. COMPLIANCE STATEMENT ALSO PROVIDE UNDER ENERGY COMPLIANCE NOTES ON SHEET M-001.00
GENERAL REQUIREMENT # 5: AUTOMATIC CONTROLS	MECHANICAL CONTROL SEQUENCES DRAWING M-400.00. ALL UNITS ARE PROVIDED WITH 7-DAY PROGRAMMABLE THERMOSTATS.
GENERAL REQUIREMENT # 7: INSULATION	MECHANICAL SPECIFICATIONS DRAWINGS M-400.00 UNDER DUCTWORK INSULATION
GENERAL REQUIREMENT # 11 : O&M MANUALS	MECHANICAL SPECIFICATIONS DRAWINGS M-400.00 UNDER RECORD DRAWINGS
GENERAL REQUIREMENT # 14 : DEMAND CONTROL VENTILATION	M-100.00 BREAKFAST AREA PROVIDED WITH CO2 SENSOR. ERV-1 UNIT IS SPECIFIED ON M-200.00. DEMAND CONTROL VENTILATION IS EXEMPT AS PER 503.2.5.1 EXCEPT (1) ERV IN COMPLIANCE WITH 503.2.6 IS PROVIDED.
GENERAL REQUIREMENT # 15 : MOTORIZED , SHUT-OFF DAMPERS ON EXHAUST & OUTSIDE AIR	MOTORIZED DAMPERS PROVIDE FOR ALL OUTSIDE AIR LOUVER LOCATIONS AND EXHAUST AIR DUCTWORK. REFER M-100.00, M-101.00, M-103.00, M-200.00, M-300.00 & M401.00
GENERAL REQUIREMENT #17 EXHAUST AIR RECOVERY	M-200.00: NO EQUIPMENT HAS MORE THAN 5000 CFM CAPACITY OR 70% OUTSIDE AIR FRACTION

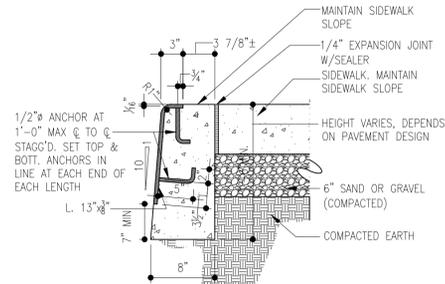






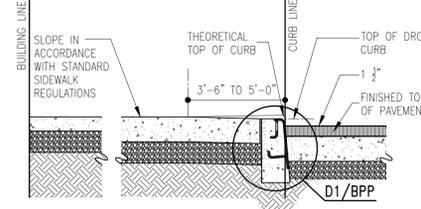
WOOD FENCE DETAIL

SCALE: 1/4"=1'-0" 01



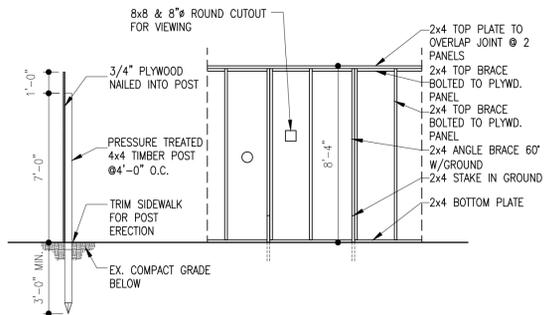
DOT: H-1015 TYP. STEEL FACE CURB DTL.

NOT TO SCALE 05



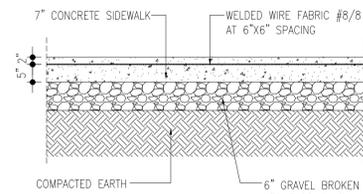
DROP CURB SECTION

SCALE: 1/2"=1'-0" 09



ALT. WOOD FENCE DETAIL

SCALE: 1/4"=1'-0" 02

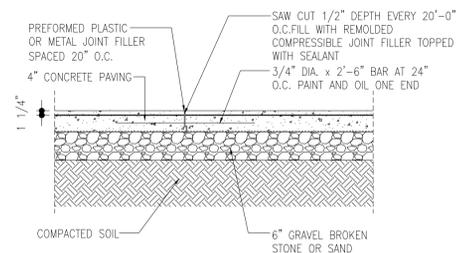


DOT:H-1045 TYPE III- SIDEWALK W/ WELDED WIRE FABRIC

06

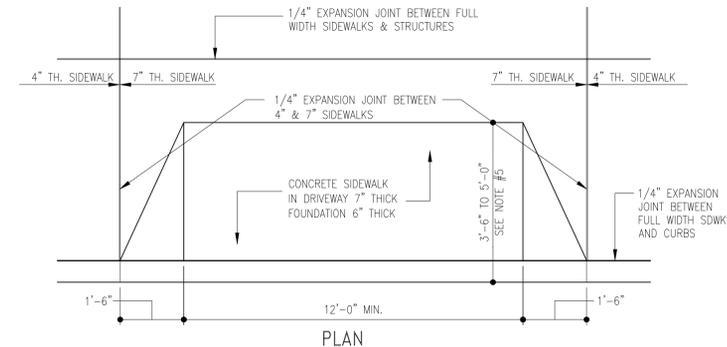
NOTES

NOTE:  
1. ALL MATERIALS AND CONSTRUCTION METHODS USED ARE TO CONFORM TO SECTION #4.13 OF THE BUREAU OF HIGHWAY OPERATIONS SPECIFICATIONS, LATEST EDITION.  
2. WELDED WIRE FABRIC, WHERE SPECIFIED, SHALL BE ASTM DESIGNATION A-185, GAUGE #8/8 AT 6"x6" SPACING, AND CONFORM TO SECTION #2.25 OF THE BUREAU OF HIGHWAY OPERATIONS SPECIFICATIONS, LATEST EDITION.



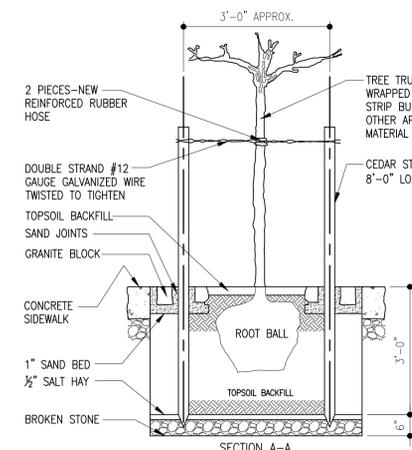
PAVEMENT EXPANSION JOINT @ 20'-0" O.C.

SCALE: 1/2"=1'-0" 03



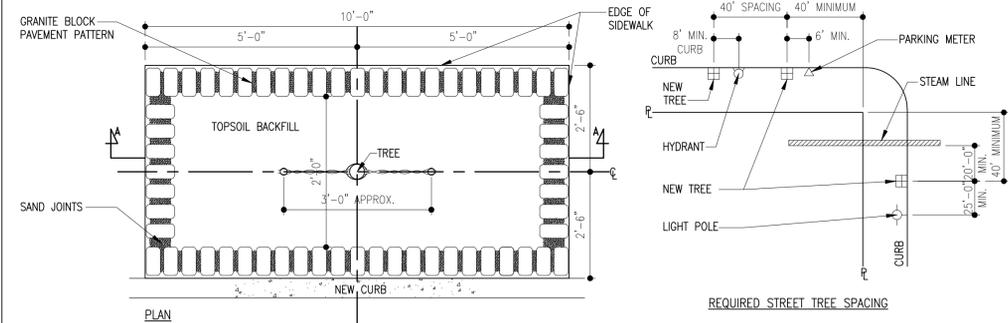
DROP CURB PLAN

SCALE: 1/2"=1'-0" 07



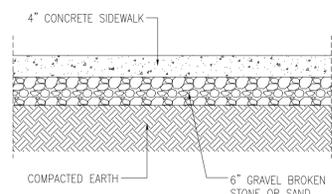
TREE PIT NOTES - BUREAU OF HIGHWAY OPERATIONS:

1. ALL MATERIALS AND CONSTRUCTION METHODS USED ARE TO CONFORM TO SECTION #4.16 OF THE BUREAU OF HIGHWAY OPERATIONS SPECIFICATIONS, LATEST EDITION.
2. PRIOR TO THE START OF WORK, THE CONTRACTOR SHALL OBTAIN THE NECESSARY PERMIT FROM THE DEPT. OF PARK AND RECREATION FOR THE REMOVAL AND PLANTING OF TREES.
3. TREE PITS SHALL BE LOCATED TWO (2) FEET MIN. FROM GAS, OIL OR WATER YOKES.
4. TREE STAKES ARE TO BE REMOVED BY THE TREE SUBCONTRACTOR NOT LESS THAN ONE YEAR AFTER PLANTING OF SAID TREE AND PRIOR TO THE FINAL ACCEPTANCE OF THE WORK.
5. USE OF SIDEWALK PAVEMENT MATERIALS OTHER THAN GRANITE BLOCK MUST BE SPECIFICALLY APPROVED, IN WRITING, BY THE BUREAU OF HIGHWAY OPERATIONS.
6. GRANITE BLOCK IN TREE PIT SHALL BE PAID FOR UNDER ITEM No. 6.06 STREET TREE SPACING.



DOT: H-1046 STREET TREE PLANTING DTL.

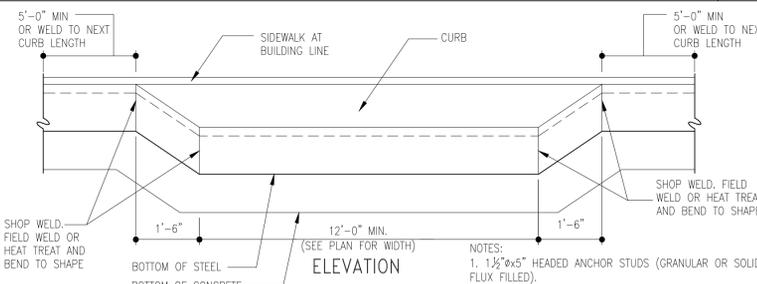
SCALE: 1/2"=1'-0" 10



DOT:H-1045 TYPE I- SIDEWALK, OUTSIDE DRIVEWAY

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

04



DROP CURB ELEVATION

SCALE: 1/2"=1'-0" 08

CONSULTANTS:

STRUCTURAL:
MEP/FA/PPP/FS:
GEOTECH:

NO.	DATE	DESCRIPTION OF REVISION
06-24-15		AS PER DOB OBJECTIONS

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Mss

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148-45, HILLSIDE AVENUE  
SUITE 201  
JAMAICA, NY 11435  
TEL: 718.657.6222  
FAX: 718.657.6226  
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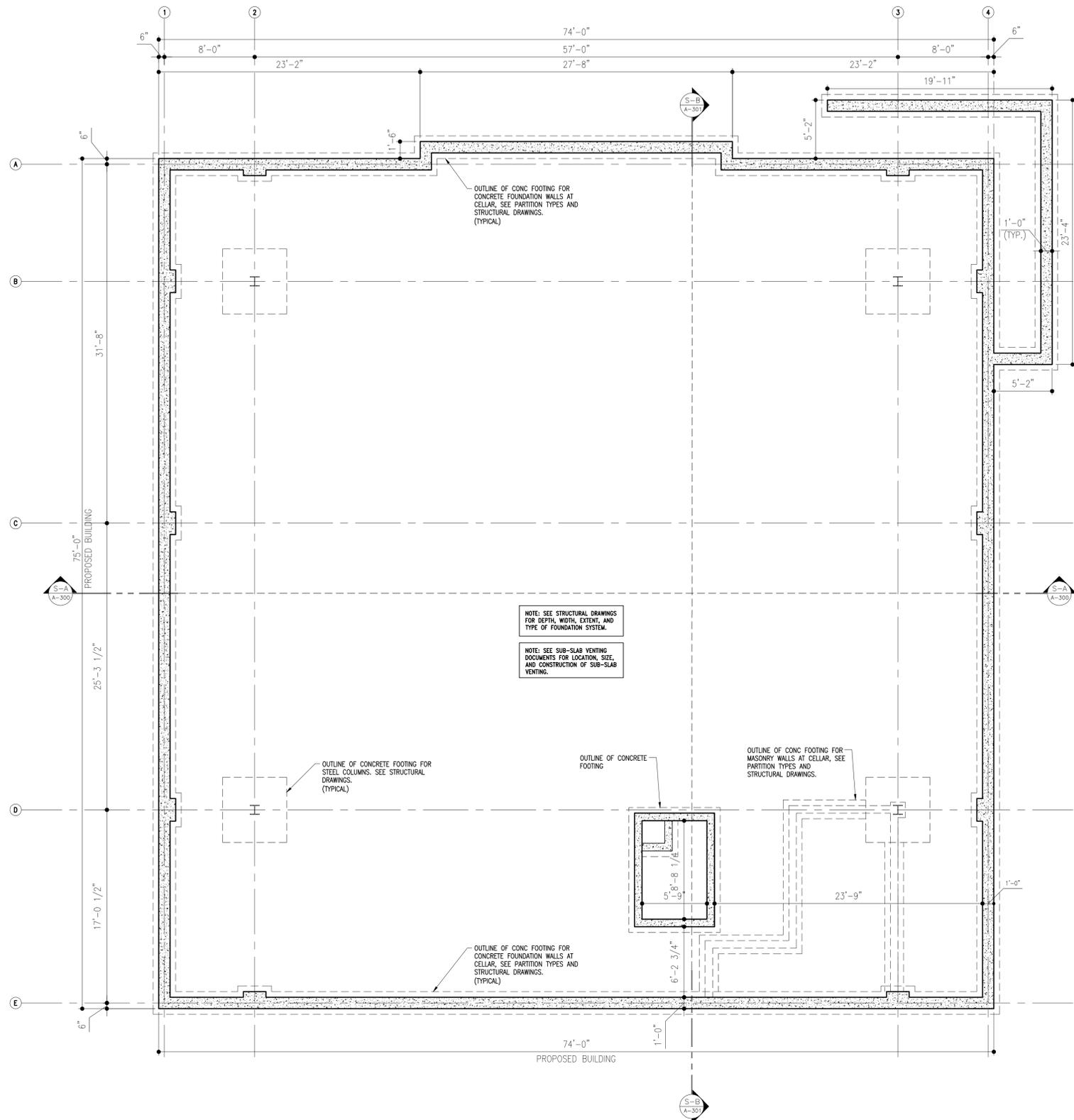
CLIENT:  
SHIV SHAKTI PEETH  
(HINDU TEMPLE)

DOB STAMP & SIGNATURE:

PROJECT:  
PROPOSED 2-STY AND CELLAR TEMPLE W/  
CARETAKER'S APARTMENT AND RECTORY  
264-16 HILLSIDE AVENUE,  
GLEN OAKS, NY 11004

TITLE:  
STREET TREE PLANTING DETAILS AND NOTES

SEAL & SIGNATURE: DATE: 10.16.14  
PROJECT NO.: MSS-630  
DRAWING BY: AC  
CHK. BY: MSS  
DWG. NO.:  
**C-100.00**  
CAD FILE NO: 05 OF 37  
Z: 1-MSS



**P1** FOUNDATION PLAN  
**A001** SCALE: 3/16"=1'-0"

**EXIT SIGN DESIGN NOTES AS PER BC 27-385 & BC 27-534(e)**

1. A TACTILE SIGN INDICATING EXIT AND COMPLYING WITH ICC A 117.1 SHALL BE PROVIDED ADJACENT TO EACH DOOR TO AN EGRESS STAIR, AN EXIT PASSAGEWAY AND EXIT DISCHARGE.
2. A SIGN SHALL BE PROVIDED AT EACH FLOOR LANDING IN INTERIOR VERTICAL EXIT ENCLOSURE CONNECTING MORE THAN THREE STORIES DESIGNATING THE FLOOR LEVEL.
3. EXIT SIGN PLACEMENT SHALL BE SUCH THAT NO POINT IN AN EXIT ACCESS CORRIDOR IS MORE THAN 100 FEET OR THE LISTED VIEWING DISTANCE FOR THE SIGN, WHICHEVER IS LESS, FROM THE NEAREST VISIBLE EXIT SIGNS.

**SMOKE ALARM & DETECTOR NOTES AS PER BC 907.2.8.3**

1. SMOKE DETECTORS AND AUDIBLE NOTIFICATION APPLIANCES SHALL BE INSTALLED IN DWELLING UNITS AND SHALL BE ANNUNCIATED BY DWELLING UNIT AT A CONSTANTLY ATTENDED LOCATION FROM WHICH THE FIRE ALARM SYSTEM IS CAPABLE OF BEING MANUALLY ACTIVATED.
2. SMOKE DETECTORS ARE REQUIRED IN THE FOLLOWING AREAS:
  - IN SLEEPING AREAS
  - IN EVERY ROOM IN THE PATH OF EGRESS FROM THE SLEEPING AREA TO THE DOOR LEADING FROM THE DWELLING UNIT.
  - IN EACH STORY WITHIN THE UNIT, INCLUDING BELOW-GRADE STORIES, FOR DWELLING UNITS WITH SPLIT LEVELS AND WITHOUT AN INTERVENING DOOR BETWEEN THE ADJACENT LEVELS, SMOKE ALARM INSTALLED ON THE UPPER LEVEL SHALL SUFFICE FOR THE ADJACENT LOWER LEVEL.

**CARBON MONOXIDE ALARM & DETECTOR NOTES AS PER BC 908.7**

1. CARBON MONOXIDE DETECTORS AND AUDIBLE NOTIFICATION APPLIANCES SHALL BE INSTALLED IN AFFECTED DWELLING UNITS AND SHALL BE ANNUNCIATED BY DWELLING UNIT AT A CONSTANTLY ATTENDED LOCATION FROM WHICH THE FIRE ALARM SYSTEM IS CAPABLE OF BEING MANUALLY ACTIVATED.
2. CARBON MONOXIDE DETECTORS SHALL BE LOCATED WITHIN DWELLING UNITS AS FOLLOWS:
  - OUTSIDE ANY ROOM USED FOR SLEEPING PURPOSES, WITHIN 15 FEET OF THE ENTRANCE OF SUCH ROOM.
  - IN ANY ROOM USED FOR SLEEPING PURPOSES.
  - ON ANY STORY WITHIN A DWELLING UNIT, INCLUDING BELOW-GRADE STORES AND PENTHOUSES OF ANY AREA, BUT NOT INCLUDING CRAWL SPACES AND UNINHABITABLE ATTICS.
3. CARBON MONOXIDE ALARM OR DETECTORS SHALL COMPLY WITH THE POWER SOURCE, INTERCONNECTION, AND ACCEPTANCE TESTING REQUIREMENTS AS REQUIRED FOR SMOKE ALARMS.
4. CARBON MONOXIDE ALARMS AND DETECTORS SHALL BE LISTED IN ACCORDANCE WITH UL 2034 AND UL 2075.

**ELEVATOR NOTES**

- A) ELEVATOR SHAFT DIMENSIONS ARE SHOWN AS PER SELECTED MANUFACTURER'S RECOMMENDATIONS.
- B) GC TO VERIFY WITH ELEVATOR MANUFACTURER FOR THE SIZE OF REQUIRED SHAFT, OPENINGS, REQUIRED CLEARANCES, PIT DEPTH, BULKHEAD HEIGHT AND VENTING PRIOR TO COMMENCEMENT OF ANY WORK ON THE SHAFT WALL OR ITS STRUCTURE
- C) GC TO PROVIDE SHOP DRAWINGS FOR ARCHITECT'S REVIEW AND APPROVAL CLEARLY SHOWING THE REQUIRED ROUGH OPENING PRIOR TO BUILDING OF THE SHAFT WALL AND STEEL STRUCTURE SUPPORTING SUCH SHAFT

**LEGEND**

	- PARTITION TYPE 1	- 8" CONC. BLK. INTERIOR PARTITION 2-HR F.R.
	- PARTITION TYPE 2	- 3 1/2" MTL. STUD WALL W/ 1/2" GYP.BD. ON E.S. (N.R.)
	- PARTITION TYPE 3	- 2 1/2" MTL. STUD WALL W/ (1) 5/8" GYP.BD. ON ONE SIDE & (2) 5/8" GYP.BD. ON OPPOSITE SIDE (F.C. 60) 1-HR F.R. 50 TO 54 STC.
	- PARTITION TYPE 4	- 3 1/2" MTL. STUD WALL W/ 5/8" GYP.BD. ON E.S. (F.C. 60) 1-HR F.R. 50 TO 54 STC.
	- PARTITION TYPE 5	- 3 1/2" MTL. STUD WALL W/ 2-5/8" GYP.BD. ON E.S. 2-HR F.R. 55 TO 59 STC.
	- PARTITION TYPE 6	- 2-HR F.R. SHAFT WALL (SEE DETAIL PROVIDED), 50 TO 54 STC.
	- PARTITION TYPE 7	- 8" CONCRETE BLOCK EXTERIOR WALL OR AS SHOWN ON PLAN WITH 3-1/2" METAL FRAMING + BATT INSULATION INSIDE + 5/8" GIB AND 1/2" STUCCO OUTSIDE. 3-HR F.R.
	- PARTITION TYPE 8	- POURED CONCRETE WALL. SEE DWG. FOR THICKNESS
	SD/CO	- SMOKE DETECTOR SHALL COMPLY WITH SEC. 907.2.8.3 AND 907.2.9 OF NYC BUILDING CODE AND C.O. WITH SEC. 908.7 OF NYC BUILDING CODE.
	50	- EXHAUST FAN, CFM AS SHOWN
	EL	- EMERGENCY LIGHT
	EXIT	- LOCATION OF EXIT SIGN & LIGHT DIRECTION
	FEC	- RECESSED FIRE EXTINGUISHER CABINET, MOUNTING HEIGHT PER CODE

**FINISH SCHEDULE**

	PAINTED OVER EXISTING CONCRETE FLOOR (COLOR T.B.D.)		CERAMIC TILE (COLOR T.B.D.)		CARPET (COLOR T.B.D.)		TILE (COLOR T.B.D.)
--	-----------------------------------------------------	--	-----------------------------	--	-----------------------	--	---------------------

**CONSTRUCTION PLAN LEGEND**

- 1 - HANDWASH SINK
- 2 - 38"H. METAL GUARDRAIL (ADA COMPLYING AS PER CODE), (TYP.)
- 3 - NEW METAL COLUMN ENCASED IN A 2 HR. FIRE RATED ENCLOSURE.
- 4 - 4'x4'x3" HIGH PLATFORM FOR SHIVLINGA.
- 5 - WOODEN SHOE RACKS (TYP.).
- 6 - METAL LADDER FOR ROOF ACCESS.
- 7 - ROOF ACCESS HATCH DOOR.
- 8 - HVAC ROOF TOP UNIT. (SEE MEP DRAWINGS FOR SPECIFICATIONS).
- 9 - ROOF DRAIN 4" VERT. PIPE AT DRAIN. 2" BUILD UP: 20.0 GPM USE "RAINTROL FLOW CONTROL ROOF DRAINS #Z-105ERC", WITH 5 WEIR OPENINGS - TO DRYWELL.
- 10 - 4 PLY BUILT-UP ROOFING W/ ALUM. COATING OVER, ON RIGID INSULATION SLOPED TO DRAIN AND 3/4" EXT. GRADE PLYWOOD.
- 11 - PIT LADDER AND LIGHTING CONTROL AT ELEVATOR PIT, REFER TO ELEVATOR PLANS AND DETAILS FOR ADDITIONAL NOTES.
- 12 - ELEVATOR SUMP PUMP, REFER TO PLUMBING AND ELECTRICAL.
- 13 - 42" HIGH PARAPET WALL, TYPICAL AT ALL ROOF EDGES
- 14 - OVERFLOW ROOF SCUPPER, PITCH ROOFING TO SCUPPER.
- 15 - TRENCH DRAIN.
- 16 - FRONT LOAD CLOTHES WASHER.
- 17 - FRONT LOAD CLOTHES DRYER.
- 18 - LAUNDRY STANDPIPE.
- 19 - MOVABLE FURNITURE.
- 20 - SERVICE COUNTER

**CONSULTANTS:**

STRUCTURAL:
MEP/FA/PPP/FS:
GEOTECH:

NO.	DATE	DESCRIPTION OF REVISION
06-24-15		AS PER DOB OBJECTIONS

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 mss@mssarch.com

CLIENT:  
**SHIV SHAKTI PEETH**  
 (HINDU TEMPLE)

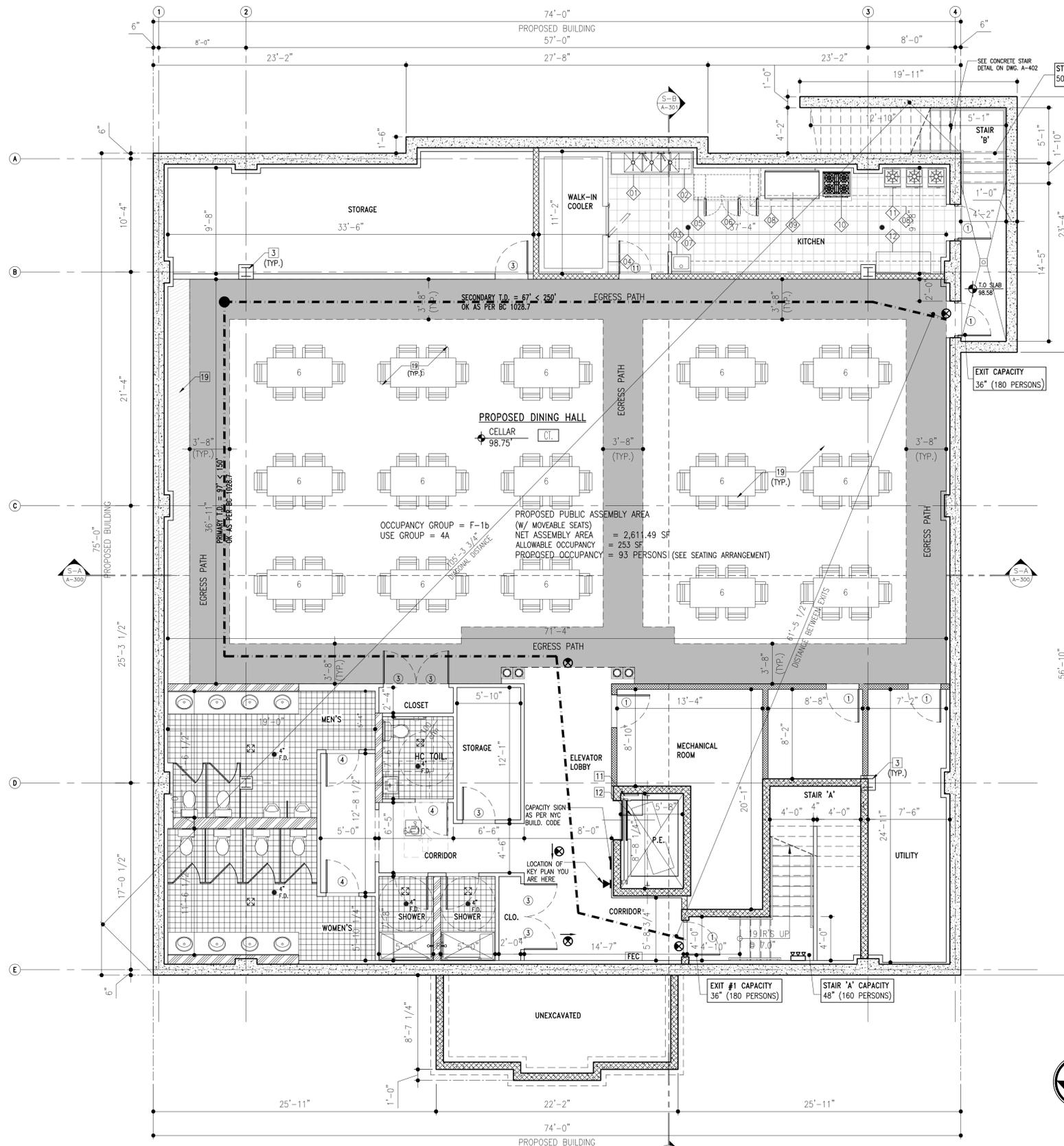
DOB STAMP & SIGNATURE:

PROJECT:  
**PROPOSED 2-STY AND CELLAR TEMPLE W/  
 CARETAKER'S APARTMENT AND RECTORY**  
 264-16 HILLSIDE AVENUE,  
 GLEN OAKS, NY 11004

TITLE:  
**FOUNDATION PLAN**

SEAL & SIGNATURE: \_\_\_\_\_  
 DATE: 10.16.14  
 PROJECT NO.: MSS-630  
 DRAWING BY: AC  
 CHK. BY: MSS  
 DWG. NO.:  
**FO-001.00**  
 CAD FILE NO: 10 OF 37  
 Z: 1-MSS





**P1 CELLAR PLAN**  
 A100 SCALE: 3/16"=1'-0"

**DINING HALL OCCUPANCY NOTE:**  
 DINING HALL SHALL BE NON-SIMULTANEOUSLY OCCUPIED WITH FIRST FLOOR WARSHIP HALL.

TOTAL NUMBER OF PARISHIONERS IN BUILDING SHALL NOT EXCEED MAXIMUM ALLOWABLE BY ANY SINGLE SPACE.

**EXIT SIGN DESIGN NOTES AS PER BC 27-385 & BC 27-534(e)**

- A TACTILE SIGN INDICATING EXIT AND COMPLYING WITH ICC A 117.1 SHALL BE PROVIDED ADJACENT TO EACH DOOR TO AN EGRESS STAIR, AN EXIT PASSAGEWAY AND EXIT DISCHARGE.
- A SIGN SHALL BE PROVIDED AT EACH FLOOR LANDING IN INTERIOR VERTICAL EXIT ENCLOSURE CONNECTING MORE THAN THREE STORIES DESIGNATING THE FLOOR LEVEL.
- EXIT SIGN PLACEMENT SHALL BE SUCH THAT NO POINT IN AN EXIT ACCESS CORRIDOR IS MORE THAN 100 FEET OR THE LISTED VIEWING DISTANCE FOR THE SIGN, WHICHEVER IS LESS, FROM THE NEAREST VISIBLE EXIT SIGNS.

**SMOKE ALARM & DETECTOR NOTES AS PER BC 907.2.8.3**

- SMOKE DETECTORS AND AUDIBLE NOTIFICATION APPLIANCES SHALL BE INSTALLED IN DWELLING UNITS AND SHALL BE ANNUNCIATED BY DWELLING UNIT AT A CONSTANTLY ATTENDED LOCATION FROM WHICH THE FIRE ALARM SYSTEM IS CAPABLE OF BEING MANUALLY ACTIVATED.
- SMOKE DETECTORS ARE REQUIRED IN THE FOLLOWING AREAS:
  - IN SLEEPING AREAS
  - IN EVERY ROOM IN THE PATH OF EGRESS FROM THE SLEEPING AREA TO THE DOOR LEADING FROM THE DWELLING UNIT.
  - IN EACH STORY WITHIN THE UNIT, INCLUDING BELOW-GRADE STORIES, FOR DWELLING UNITS WITH SPLIT LEVELS AND WITHOUT AN INTERVENING DOOR BETWEEN THE ADJACENT LEVELS, SMOKE ALARM INSTALLED ON THE UPPER LEVEL SHALL SUFFICE FOR THE ADJACENT LOWER LEVEL.

**CARBON MONOXIDE ALARM & DETECTOR NOTES AS PER BC 908.7**

- CARBON MONOXIDE DETECTORS AND AUDIBLE NOTIFICATION APPLIANCES SHALL BE INSTALLED IN AFFECTED DWELLING UNITS AND SHALL BE ANNUNCIATED BY DWELLING UNIT AT A CONSTANTLY ATTENDED LOCATION FROM WHICH THE FIRE ALARM SYSTEM IS CAPABLE OF BEING MANUALLY ACTIVATED.
- CARBON MONOXIDE DETECTORS SHALL BE LOCATED WITHIN DWELLING UNITS AS FOLLOWS:
  - OUTSIDE ANY ROOM USED FOR SLEEPING PURPOSES, WITHIN 15 FEET OF THE ENTRANCE OF SUCH ROOM.
  - IN ANY ROOM USED FOR SLEEPING PURPOSES.
  - ON ANY STORY WITHIN A DWELLING UNIT, INCLUDING BELOW-GRADE STORES AND PENTHOUSES OF ANY AREA, BUT NOT INCLUDING CRAWL SPACES AND UNINHABITABLE ATTICS.
- CARBON MONOXIDE ALARM OR DETECTORS SHALL COMPLY WITH THE POWER SOURCE, INTERCONNECTION, AND ACCEPTANCE TESTING REQUIREMENTS AS REQUIRED FOR SMOKE ALARMS.
- CARBON MONOXIDE ALARMS AND DETECTORS SHALL BE LISTED IN ACCORDANCE WITH UL 2034 AND UL 2075.

**ELEVATOR NOTES**

- ELEVATOR SHAFT DIMENSIONS ARE SHOWN AS PER SELECTED MANUFACTURER'S RECOMMENDATIONS.
- GC TO VERIFY WITH ELEVATOR MANUFACTURER FOR THE SIZE OF REQUIRED SHAFT, OPENINGS, REQUIRED CLEARANCES, PIT DEPTH, BULKHEAD HEIGHT AND VENTING PRIOR TO COMMENCEMENT OF ANY WORK ON THE SHAFT WALL OR ITS STRUCTURE.
- GC TO PROVIDE SHOP DRAWINGS FOR ARCHITECT'S REVIEW AND APPROVAL CLEARLY SHOWING THE REQUIRED ROUGH OPENING PRIOR TO BUILDING OF THE SHAFT WALL AND STEEL STRUCTURE SUPPORTING SUCH SHAFT

**LEGEND**

- PARTITION TYPE 1 - 8" CONC. BLK. INTERIOR PARTITION 2-HR F.R.
- PARTITION TYPE 2 - 3" MTL. STUD WALL W/ 1/2" GYP.BD. ON E.S. (N.R.)
- PARTITION TYPE 3 - 2" MTL. STUD WALL W/ (1) 5/8" GYP.BD. ON ONE SIDE & (2) 5/8" GYP.BD. ON OPPOSITE SIDE (F.C. 60) 1-HR F.R. 50 TO 54 STC.
- PARTITION TYPE 4 - 3" MTL. STUD WALL W/ 5/8" GYP.BD. ON E.S. (F.C. 60) 1-HR F.R. 50 TO 54 STC.
- PARTITION TYPE 5 - 3" MTL. STUD WALL W/ 2-5/8" GYP.BD. ON E.S. 2-HR F.R. 55 TO 59 STC.
- PARTITION TYPE 6 - 2-HR F.R. SHAFT WALL (SEE DETAIL PROVIDED), 50 TO 54 STC.
- PARTITION TYPE 7 - 8" CONCRETE BLOCK EXTERIOR WALL OR AS SHOWN ON PLAN WITH 3-1/2" METAL FRAMING + BATT INSULATION INSIDE + 5/8" GWB AND 1/2" STUCCO OUTSIDE. 3-HR F.R.
- PARTITION TYPE 8 - POURED CONCRETE WALL. SEE DWG. FOR THICKNESS
- SD/CO - SMOKE DETECTOR SHALL COMPLY WITH SEC. 907.2.8.3 AND 907.2.9 OF NYC BUILDING CODE AND C.O. WITH SEC. 908.7 OF NYC BUILDING CODE.
- 50 - EXHAUST FAN, CFM AS SHOWN
- EM - EMERGENCY LIGHT
- ES - LOCATION OF EXIT SIGN & LIGHT DIRECTION
- FEC - RECESSED FIRE EXTINGUISHER CABINET, MOUNTING HEIGHT PER CODE

**FINISH SCHEDULE**

- P PAINTED OVER EXISTING CONCRETE FLOOR (COLOR T.B.D.)
- CT CERAMIC TILE (COLOR T.B.D.)
- C CARPET (COLOR T.B.D.)
- T TILE (COLOR T.B.D.)

**CONSTRUCTION PLAN LEGEND**

- HANDWASH SINK
- 38" H. METAL GUARDRAIL (ADA COMPLYING AS PER CODE). (TYP.)
- NEW METAL COLUMN ENCASED IN A 2 HR. FIRE RATED ENCLOSURE.
- 4'x4'x3' HIGH PLATFORM FOR SHINGLING.
- WOODEN SHOE RACKS (TYP.)
- METAL LADDER FOR ROOF ACCESS.
- ROOF ACCESS HATCH DOOR.
- HVAC ROOF TOP UNIT. (SEE MEP DRAWINGS FOR SPECIFICATIONS).
- ROOF DRAIN 4" VERT. PIPE AT DRAIN. 2" BUILD UP: 20.0 GPM USE "RAINTROL FLOW CONTROL ROOF DRAINS #Z-105ERC", WITH 5 WEIR OPENINGS - TO DRYWELL.
- 4 PLY BUILT-UP ROOFING W/ ALUM. COATING OVER, ON RIGID INSULATION SLOPED TO DRAIN AND 3/4" EXT. GRADE PLYWOOD.
- PIT LADDER AND LIGHTING CONTROL AT ELEVATOR PIT. REFER TO ELEVATOR PLANS AND DETAILS FOR ADDITIONAL NOTES.
- ELEVATOR SUMP PUMP, REFER TO PLUMBING AND ELECTRICAL.
- 42" HIGH PARAPET WALL, TYPICAL AT ALL ROOF EDGES.
- OVERFLOW ROOF SCUPPER, PITCH ROOFING TO SCUPPER.
- TRENCH DRAIN.
- FRONT LOAD CLOTHES WASHER.
- FRONT LOAD CLOTHES DRYER.
- LAUNDRY STANDPIPE.
- MOVABLE FURNITURE.
- SERVICE COUNTER

**EQUIPMENT SCHEDULE**

NO.	DESCRIPTION	SIZE	H.W.	C.W.	WASTE		ELECTRICAL	GAS	DESCRIPTION	MEA #	BTU'S
					DIRECT	INDIRECT					
1	TRIPLE SINK								ADVANCE TABCO OR SIMILAR		
2	GREASE TRAP										
3	HAND WASH SINK								ADVANCE TABCO OR SIMILAR		
4	FREEZER/REF.							●	MDL # 3SSD BY TURBOAIR OR SIMILAR	433-83-E-1	40,000 BTU
5	UNDERCOUNTER REFRIGERATOR							●	MDL # JUR72 BY TURBOAIR OR SIMILAR		
6	PREPARATION COUNTER								MS-366 BY ADVANCE TABCO OR SIMILAR		
7	FLOOR DRAIN										
8	EXHAUST HOOD							●	4000 CFM, EXHAUST HOOD (18 GA)		
9	GRIDDLE PLATE							● ●	MSA-60 BY VULCAN OR SIMILAR		135,000 BTU
10	COOKING RANGE							●	CPC-HP-2-12C	59-84-E-1	60,000 BTU
11	POT BURNER							●	ISPA-18 BY IMPERIAL OR SIMILAR		90,000 BTU
12	WORK TABLE										
TOTAL BTU'S											325,000 BTU

**CONSULTANTS:**

STRUCTURAL:  
 MEP/FA/PPP/FS:

**GEOTECH:**

**NO. DATE DESCRIPTION OF REVISION**

06-24-15 AS PER DOB OBJECTIONS

THESE DOCUMENTS ARE COPYRIGHTED AND ARE SUBJECT TO COPYRIGHT PROTECTION AS "ARCHITECTURAL WORK" UNDER SEC.102 OF COPYRIGHT ACT, 17 U.S.O. AS AMENDED DECEMBER 1990 AND KNOWN AS ARCHITECTURAL WORKS COPYRIGHT PROTECTION ACT OF 1990. THE PROTECTION INCLUDES BUT IS NOT LIMITED TO OVERALL FORM AS WELL AS THE ARRANGEMENT AND COMPOSITION OF SPACES AND ELEMENTS OF THE DESIGN.

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 M.S. SAVANI ARCHITECT, PC

**Mss**

**M.S. SAVANI ARCHITECT, PC**

148-45, HILLSIDE AVENUE  
 SUITE 201  
 JAMAICA, NY 11435  
 TEL: 718.657.6222  
 FAX: 718.657.6226  
 mss@mssarch.com

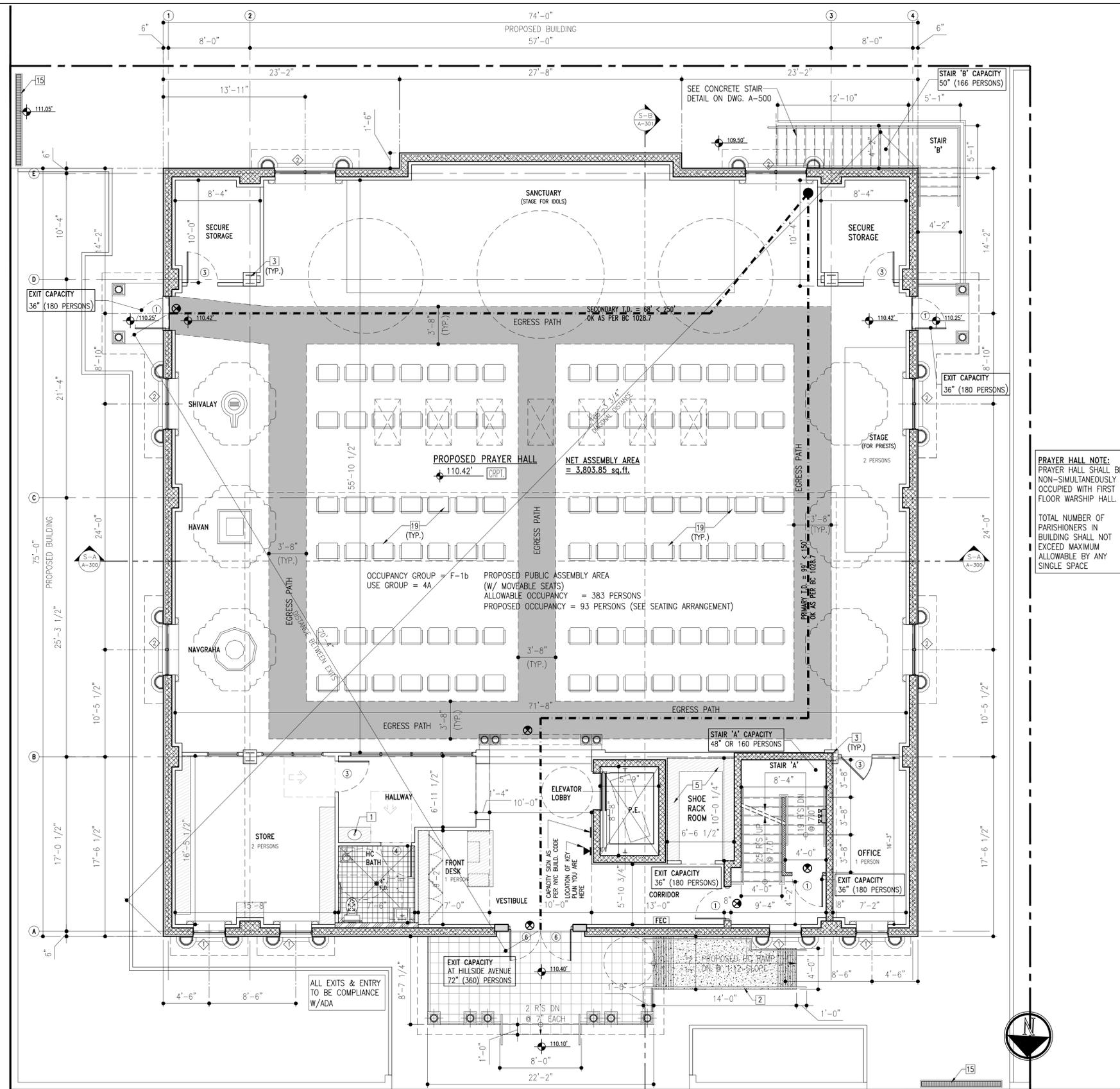
CLIENT:  
 SHIV SHAKTI PEETH  
 (HINDU TEMPLE)

DOB STAMP & SIGNATURE:

PROJECT:  
 PROPOSED 2-STY AND CELLAR TEMPLE W/  
 CARETAKER'S APARTMENT AND RECTORY  
 264-16 HILLSIDE AVENUE,  
 GLEN OAKS, NY 11004

**CELLAR PLAN**

SEAL & SIGNATURE:  
 DATE: 10.16.14  
 PROJECT NO.: MSS-630  
 DRAWING BY: AC  
 CHK. BY: MSS  
 DWG. NO.:  
**A-100.00**  
 CAD FILE NO: 11 OF 37  
 Z: 1-MSS



**PRAYER HALL NOTE:**  
 PRAYER HALL SHALL BE NON-SIMULTANEOUSLY OCCUPIED WITH FIRST FLOOR WARSHIP HALL.

TOTAL NUMBER OF PARISHIONERS IN BUILDING SHALL NOT EXCEED MAXIMUM ALLOWABLE BY ANY SINGLE SPACE

**EXIT SIGN DESIGN NOTES AS PER BC 27-385 & BC 27-534(e)**

1. A TACTILE SIGN INDICATING EXIT AND COMPLYING WITH ICC A 117.1 SHALL BE PROVIDED ADJACENT TO EACH DOOR TO AN EGRESS STAIR, AN EXIT PASSAGEWAY AND EXIT DISCHARGE.
2. A SIGN SHALL BE PROVIDED AT EACH FLOOR LANDING IN INTERIOR VERTICAL EXIT ENCLOSURE CONNECTING MORE THAN THREE STORIES DESIGNATING THE FLOOR LEVEL.
3. EXIT SIGN PLACEMENT SHALL BE SUCH THAT NO POINT IN AN EXIT ACCESS CORRIDOR IS MORE THAN 100 FEET OR THE LISTED VIEWING DISTANCE FOR THE SIGN, WHICHEVER IS LESS, FROM THE NEAREST VISIBLE EXIT SIGNS.

**SMOKE ALARM & DETECTOR NOTES AS PER BC 907.2.8.3**

1. SMOKE DETECTORS AND AUDIBLE NOTIFICATION APPLIANCES SHALL BE INSTALLED IN DWELLING UNITS AND SHALL BE ANNUNCIATED BY DWELLING UNIT AT A CONSTANTLY ATTENDED LOCATION FROM WHICH THE FIRE ALARM SYSTEM IS CAPABLE OF BEING MANUALLY ACTIVATED.
2. SMOKE DETECTORS ARE REQUIRED IN THE FOLLOWING AREAS:
  - IN SLEEPING AREAS
  - IN EVERY ROOM IN THE PATH OF THE MEANS OF EGRESS FROM THE SLEEPING AREA TO THE DOOR LEADING FROM THE DWELLING UNIT.
  - IN EACH STORY WITHIN THE UNIT, INCLUDING BELOW-GRADE STORIES, FOR DWELLING UNITS WITH SPLIT LEVELS AND WITHOUT AN INTERVENING DOOR BETWEEN THE ADJACENT LEVELS, SMOKE ALARM INSTALLED ON THE UPPER LEVEL SHALL SUFFICE FOR THE ADJACENT LOWER LEVEL.

**CARBON MONOXIDE ALARM & DETECTOR NOTES AS PER BC 908.7**

1. CARBON MONOXIDE DETECTORS AND AUDIBLE NOTIFICATION APPLIANCES SHALL BE INSTALLED IN AFFECTED DWELLING UNITS AND SHALL BE ANNUNCIATED BY DWELLING UNIT AT A CONSTANTLY ATTENDED LOCATION FROM WHICH THE FIRE ALARM SYSTEM IS CAPABLE OF BEING MANUALLY ACTIVATED.
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  - IN ANY ROOM USED FOR SLEEPING PURPOSES.
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3. CARBON MONOXIDE ALARM OR DETECTORS SHALL COMPLY WITH THE POWER SOURCE, INTERCONNECTION, AND ACCEPTANCE TESTING REQUIREMENTS AS REQUIRED FOR SMOKE ALARMS.
4. CARBON MONOXIDE ALARMS AND DETECTORS SHALL BE LISTED IN ACCORDANCE WITH UL 2034 AND UL 2075.

**ELEVATOR NOTES**

- A) ELEVATOR SHAFT DIMENSIONS ARE SHOWN AS PER SELECTED MANUFACTURER'S RECOMMENDATIONS.
- B) GC TO VERIFY WITH ELEVATOR MANUFACTURER FOR THE SIZE OF REQUIRED SHAFT, OPENINGS, REQUIRED CLEARANCES, PIT DEPTH, BULKHEAD HEIGHT AND VENTING PRIOR TO COMMENCEMENT OF ANY WORK ON THE SHAFT WALL OR ITS STRUCTURE
- C) GC TO PROVIDE SHOP DRAWINGS FOR ARCHITECT'S REVIEW AND APPROVAL CLEARLY SHOWING THE REQUIRED ROUGH OPENING PRIOR TO BUILDING OF THE SHAFT WALL AND STEEL STRUCTURE SUPPORTING SUCH SHAFT

**LEGEND**

- ▨ - PARTITION TYPE 1 - 8" CONC. BLK. INTERIOR PARTITION 2-HR F.R.
- ▨ - PARTITION TYPE 2 - 3 1/2" MTL. STUD WALL W/ 1/2" GYP.BD. ON E.S. (N.R.)
- ▨ - PARTITION TYPE 3 - 2 1/2" MTL. STUD WALL W/ (1) 5/8" GYP.BD. ON ONE SIDE & (2) 5/8" GYP.BD. ON OPPOSITE SIDE (F.C. 60) 1-HR F.R. 50 TO 54 STC.
- ▨ - PARTITION TYPE 4 - 3 1/2" MTL. STUD WALL W/ 5/8" GYP.BD. ON E.S. (F.C. 60) 1-HR F.R. 50 TO 54 STC.
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- ▨ - PARTITION TYPE 6 - 2-HR F.R. SHAFT WALL (SEE DETAIL PROVIDED), 50 TO 54 STC.
- ▨ - PARTITION TYPE 7 - 8" CONCRETE BLOCK EXTERIOR WALL OR AS SHOWN ON PLAN WITH 3-1/2" METAL FRAMING + BATT INSULATION INSIDE + 5/8" GWB AND 1/2" STUCCO OUTSIDE. 3-HR F.R.
- ▨ - PARTITION TYPE 8 - POURED CONCRETE WALL. SEE DWG. FOR THICKNESS
- SD/CO - SMOKE DETECTOR SHALL COMPLY WITH SEC. 907.2.8.3 AND 907.2.9 OF NYC BUILDING CODE AND C.O. WITH SEC. 908.7 OF NYC BUILDING CODE.
- 50 - EXHAUST FAN, CFM AS SHOWN
- EL - EMERGENCY LIGHT
- EXIT - LOCATION OF EXIT SIGN & LIGHT DIRECTION
- FEC - RECESSED FIRE EXTINGUISHER CABINET, MOUNTING HEIGHT PER CODE

**FINISH SCHEDULE**

- P PAINTED OVER EXISTING CONCRETE FLOOR (COLOR T.B.D.)
- CT CERAMIC TILE (COLOR T.B.D.)
- C CARPET (COLOR T.B.D.)
- T TILE (COLOR T.B.D.)

**CONSTRUCTION PLAN LEGEND**

- 1 - HANDWASH SINK
- 2 - 38"H. METAL GUARDRAIL (ADA COMPLYING AS PER CODE), (TYP.)
- 3 - NEW METAL COLUMN ENCASED IN A 2 HR. FIRE RATED ENCLOSURE.
- 4 - 4'x4'x3" HIGH PLATFORM FOR SHIVLINGA.
- 5 - WOODEN SHOE RACKS (TYP.)
- 6 - METAL LADDER FOR ROOF ACCESS.
- 7 - ROOF ACCESS HATCH DOOR.
- 8 - HVAC ROOF TOP UNIT. (SEE MEP DRAWINGS FOR SPECIFICATIONS).
- 9 - ROOF DRAIN 4" VERT. PIPE AT DRAIN. 2" BUILD UP: 20.0 GPM USE "RAINTROL FLOW CONTROL ROOF DRAINS #Z-10SERC", WITH 5 WEIR OPENINGS - TO DRYWELL.
- 10 - 4 PLY BUILT-UP ROOFING W/ ALUM. COATING OVER, ON RIGID INSULATION SLOPED TO DRAIN AND 3/4" EXT. GRADE PLYWOOD.
- 11 - PIT LADDER AND LIGHTING CONTROL AT ELEVATOR PIT, REFER TO ELEVATOR PLANS AND DETAILS FOR ADDITIONAL NOTES.
- 12 - ELEVATOR SUMP PUMP, REFER TO PLUMBING AND ELECTRICAL.
- 13 - 42" HIGH PARAPET WALL, TYPICAL AT ALL ROOF EDGES
- 14 - OVERFLOW ROOF SCUPPER, PITCH ROOFING TO SCUPPER.
- 15 - TRENCH DRAIN.
- 16 - FRONT LOAD CLOTHES WASHER.
- 17 - FRONT LOAD CLOTHES DRYER.
- 18 - LAUNDRY STANDPIPE.
- 19 - MOVABLE FURNITURE.
- 20 - SERVICE COUNTER

**DOOR SCHEDULE**

MARK	DOOR			FRAME		U-FACTOR	SHGC	REMARKS
	SIZE	TYPE	MAT'L FIN	TYPE	MAT'L FIN			
1	3'-0" X 6'-8"	MTL.	MTL. PAINT	MTL.	PAINT	0.34	0.15	90 MIN. FPSC, SELF CLOS.
2	3'-0" X 6'-8"	MTL.	MTL. PAINT	MTL.	PAINT			45 MIN. FPSC, SELF CLOS.
3	2'-0" X 6'-8"	FLUSH	WD. PAINT	WD.	PAINT			
4	3'-0" X 6'-8"	FLUSH	WD. PAINT	WD.	PAINT			ACCESSIBLE BATHROOM DOOR
5	2'-6" X 6'-8"	MTL.	MTL. PAINT	WD.	PAINT	0.34	0.15	90 MIN. FPSC, SELF CLOS.
6	3'-0" X 6'-8"	MTL. W/ SIDELIGHTS	MTL. PAINT	WD.	PAINT	0.34	0.15	90 MIN. FPSC, SELF CLOS.
7	3'-0" X 6'-8"	GLASS	WD. & GLASS PAINT	WD.	PAINT			
8	2'-8" X 6'-8"	FLUSH	WD. PAINT	WD.	PAINT			
9			WD. PAINT	WD.	PAINT			NON-RATED DOUBLE BI-FOLD CLOSET DOORS
10			WD. PAINT	WD.	PAINT			NON-RATED BI-FOLD CLOSET DOORS
11	3'-0" X 6'-8"	MTL.	MTL. PAINT	MTL.	PAINT			90 MIN. FPSC, SELF CLOS.

**NOTES:**  
 1. ALL EXTERIOR DOORS WILL BE FIELD-FITTED WITH WEATHERSTRIPPING PER ECC SECTION 502.4.1.

**CONSULTANTS:**

**STRUCTURAL:**

**MEP/FA/PPP/FS:**

**GEOTECH:**

**06-24-15 AS PER DOB OBJECTIONS**

**NO. DATE DESCRIPTION OF REVISION**

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 M.S. SAVANI ARCHITECT, PC

**Mss**

**M.S. SAVANI ARCHITECT, PC**

148-45, HILLSIDE AVENUE  
 SUITE 201  
 JAMAICA, NY 11435  
 TEL: 718.657.6222  
 FAX: 718.657.6226  
 mss@mssarch.com

**CLIENT:**  
 SHIV SHAKTI PEETH  
 (HINDU TEMPLE)

**DOB STAMP & SIGNATURE:**

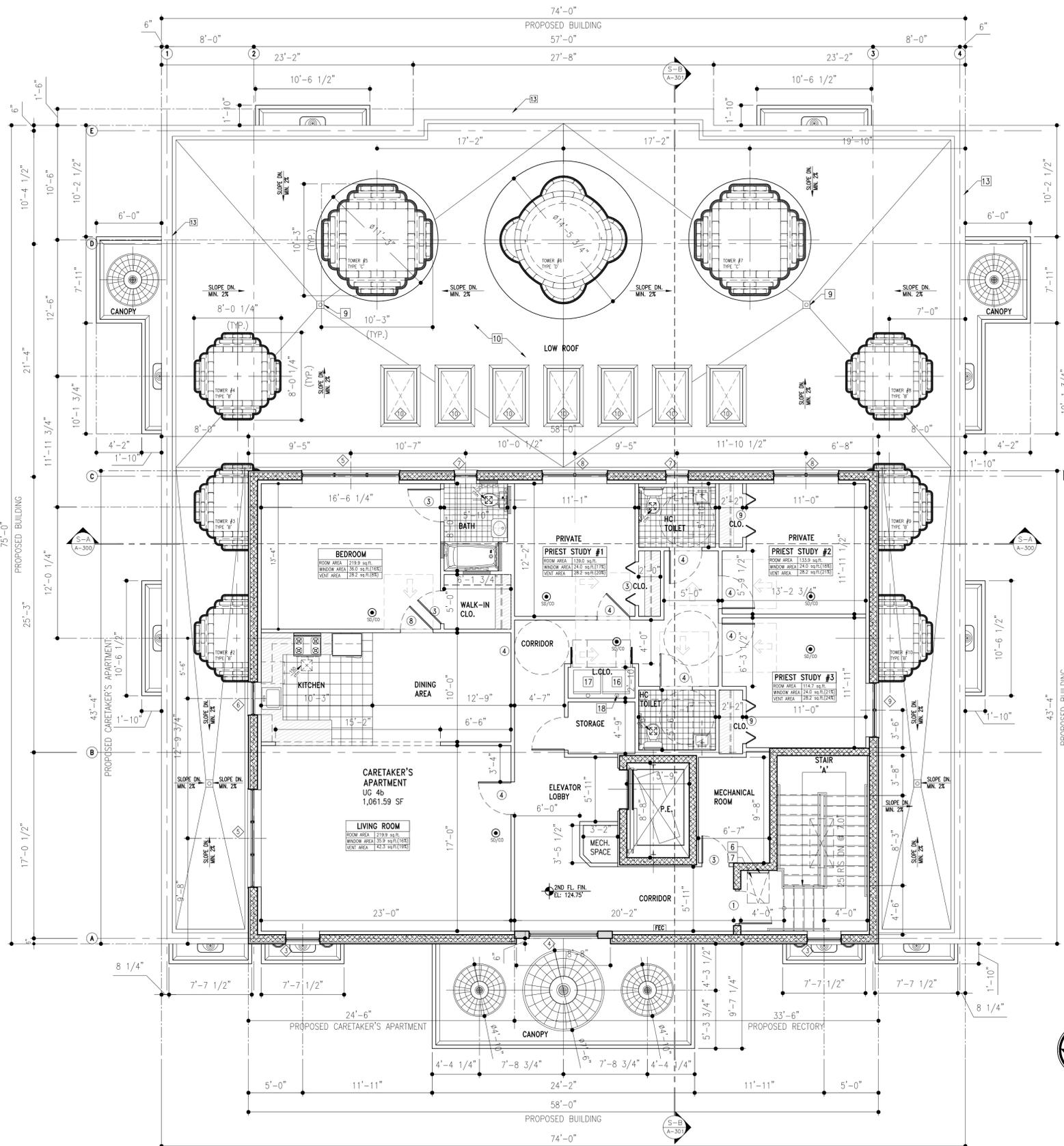
**PROJECT:**  
 PROPOSED 2-STY AND CELLAR TEMPLE W/  
 CARETAKER'S APARTMENT AND RECTORY  
 264-16 HILLSIDE AVENUE,  
 GLEN OAKS, NY 11004

**TITLE:**  
 FIRST FLOOR PLAN

**SEAL & SIGNATURE:**

DATE: 10.16.14  
 PROJECT NO.: MSS-630  
 DRAWING BY: AC  
 CHK. BY: MSS  
 DWG. NO.:  
**A-101.00**  
 CAD FILE NO: 12 OF 37  
 Z: 1-MSS

**P1** FIRST FLOOR PLAN  
 SCALE: 3/16"=1'-0"



**P11** SECOND FLOOR PLAN (RECTORY)  
**A102** SCALE: 3/16"=1'-0"

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**LEGEND**

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- PARTITION TYPE 2 - 3" MTL. STUD WALL W/ 1/2" GYP.BD. ON E.S. (N.R.)
- PARTITION TYPE 3 - 2" MTL. STUD WALL W/ (1) 5/8" GYP.BD. ON ONE SIDE & (2) 5/8" GYP.BD. ON OPPOSITE SIDE (F.C. 60) 1-HR F.R. 50 TO 54 STC.
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- PARTITION TYPE 5 - 3" MTL. STUD WALL W/ 2-5/8" GYP.BD. ON E.S. 2-HR F.R. 55 TO 59 STC.
- PARTITION TYPE 6 - 2-HR F.R. SHAFT WALL (SEE DETAIL PROVIDED), 50 TO 54 STC.
- PARTITION TYPE 7 - 8" CONCRETE BLOCK EXTERIOR WALL OR AS SHOWN ON PLAN WITH 3-1/2" METAL FRAMING + BATT INSULATION INSIDE + 5/8" GWB AND 1/2" STUCCO OUTSIDE. 3-HR F.R.
- PARTITION TYPE 8 - POURED CONCRETE WALL. SEE DWG. FOR THICKNESS
- SMOKE DETECTOR SHALL COMPLY WITH SEC. 907.2.8.3 AND 907.2.9 OF NYC BUILDING CODE AND C.O. WITH SEC. 908.7 OF NYC BUILDING CODE.
- EXHAUST FAN, CFM AS SHOWN
- EMERGENCY LIGHT
- LOCATION OF EXIT SIGN & LIGHT DIRECTION
- RECESSED FIRE EXTINGUISHER CABINET, MOUNTING HEIGHT PER CODE

**FINISH SCHEDULE**

- PAINTED OVER EXISTING CONCRETE FLOOR (COLOR T.B.D.)
- CERAMIC TILE (COLOR T.B.D.)
- CARPET (COLOR T.B.D.)
- TILE (COLOR T.B.D.)

**CONSTRUCTION PLAN LEGEND**

- HANDWASH SINK
- 38"H. METAL GUARDRAIL (ADA COMPLYING AS PER CODE), (TYP.)
- NEW METAL COLUMN ENCASED IN A 2 HR. FIRE RATED ENCLOSURE.
- 4'x4'x3' HIGH PLATFORM FOR SHIVLINGA.
- WOODEN SHOE RACKS (TYP.)
- METAL LADDER FOR ROOF ACCESS.
- ROOF ACCESS HATCH DOOR.
- HVAC ROOF TOP UNIT. (SEE MEP DRAWINGS FOR SPECIFICATIONS).
- ROOF DRAIN 4" VERT. PIPE AT DRAIN. 2" BUILD UP: 20.0 GPM USE "RAINTROL FLOW CONTROL ROOF DRAINS #Z-105ERC", WITH 5 WEIR OPENINGS - TO DRYWELL.
- 4 PLY BUILT-UP ROOFING W/ ALUM. COATING OVER, ON RIGID INSULATION SLOPED TO DRAIN AND 3/4" EXT. GRADE PLYWOOD.
- PIT LADDER AND LIGHTING CONTROL AT ELEVATOR PIT, REFER TO ELEVATOR PLANS AND DETAILS FOR ADDITIONAL NOTES.
- ELEVATOR SUMP PUMP, REFER TO PLUMBING AND ELECTRICAL.
- 42" HIGH PARAPET WALL, TYPICAL AT ALL ROOF EDGES
- OVERFLOW ROOF SCUPPER, PITCH ROOFING TO SCUPPER.
- TRENCH DRAIN.
- FRONT LOAD CLOTHES WASHER.
- FRONT LOAD CLOTHES DRYER.
- LAUNDRY STANDPIPE.
- MOVABLE FURNITURE.
- SERVICE COUNTER

**WINDOW SCHEDULE**

MARK	WIDTH	SIZE HEIGHT	TYPE	MATERIAL	MODEL	GLASS	VENT	U-FACTOR	SHGC	SILL HT.	REMARKS
1	3'-5"	6'-0"	CASEMENT	VNYL & WD.	CN26	14.9 SF	18.9 SF	0.38	0.40	2'-10"	4 EACH
2	6'-0"	6'-0"	CASEMENT	VNYL & WD. (2)	CXW16	29.2 SF	34.0 SF	0.38	0.40	2'-10"	12 EACH
3	3'-5"	5'-0"	CASEMENT	VNYL & WD.	CN25	12.2 SF	17.7 SF	0.38	0.40	2'-4"	2 EACH
4	6'-4"	5'-5"	PICTURE	VNYL & WD.	CUSTOM	29.8 SF	NONE	0.38	0.40	2'-4"	1 EACH
5	9'-0"	5'-0"	CASEMENT	VNYL & WD. (3)	CXW15	36.0 SF	28.2 SF	0.38	0.40	2'-4"	6 EACH
6	3'-0"	3'-5"	CASEMENT	VNYL & WD.	CXW135	7.8 SF	9.5 SF	0.38	0.40	3'-11"	1 EACH
7	2'-0"	3'-5"	CASEMENT	VNYL & WD.	C135	4.9 SF	6.3 SF	0.38	0.40	3'-11"	2 EACH
8	6'-0"	5'-0"	CASEMENT	VNYL & WD.	CXW25	24.0 SF	28.2 SF	0.38	0.40	3'-8"	2 EACH
9	5'-0"	5'-0"	CASEMENT	VNYL & WD.	CW25	18.2 SF	22.0 SF	0.38	0.40	3'-8"	1 EACH
10	3'-0"	5'-0"	SKYLIGHT	VNYL & WD.	TBD	11.2 SF	6 SF	0.50	0.40	NA	7 EACH

**NOTES:**

- TYPICAL SILL HEIGHT TO BE 2'-10" A.F.F. AT 1ST FLOOR AND 2'-4" AT 2ND FLOOR UNLESS OTHERWISE SPECIFIED.
- VERIFY QUANTITY AND SIZE W/ PLAN AND ELEVATION.
- ALL WINDOWS ARE ANDERSON WINDOWS 400 SERIES OR APPROVED EQUAL.

**CONSULTANTS:**

STRUCTURAL:

MEP/FA/PPP/FS:

GEOTECH:

06-24-15 AS PER DOB OBJECTIONS

NO. DATE DESCRIPTION OF REVISION

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**Mss**

**M.S. SAVANI ARCHITECT, PC**

148-45, HILLSIDE AVENUE  
 SUITE 201  
 JAMAICA, NY 11435  
 TEL: 718.657.6222  
 FAX: 718.657.6226  
 mss@mssarch.com

CLIENT:  
 SHIV SHAKTI PEETH  
 (HINDU TEMPLE)

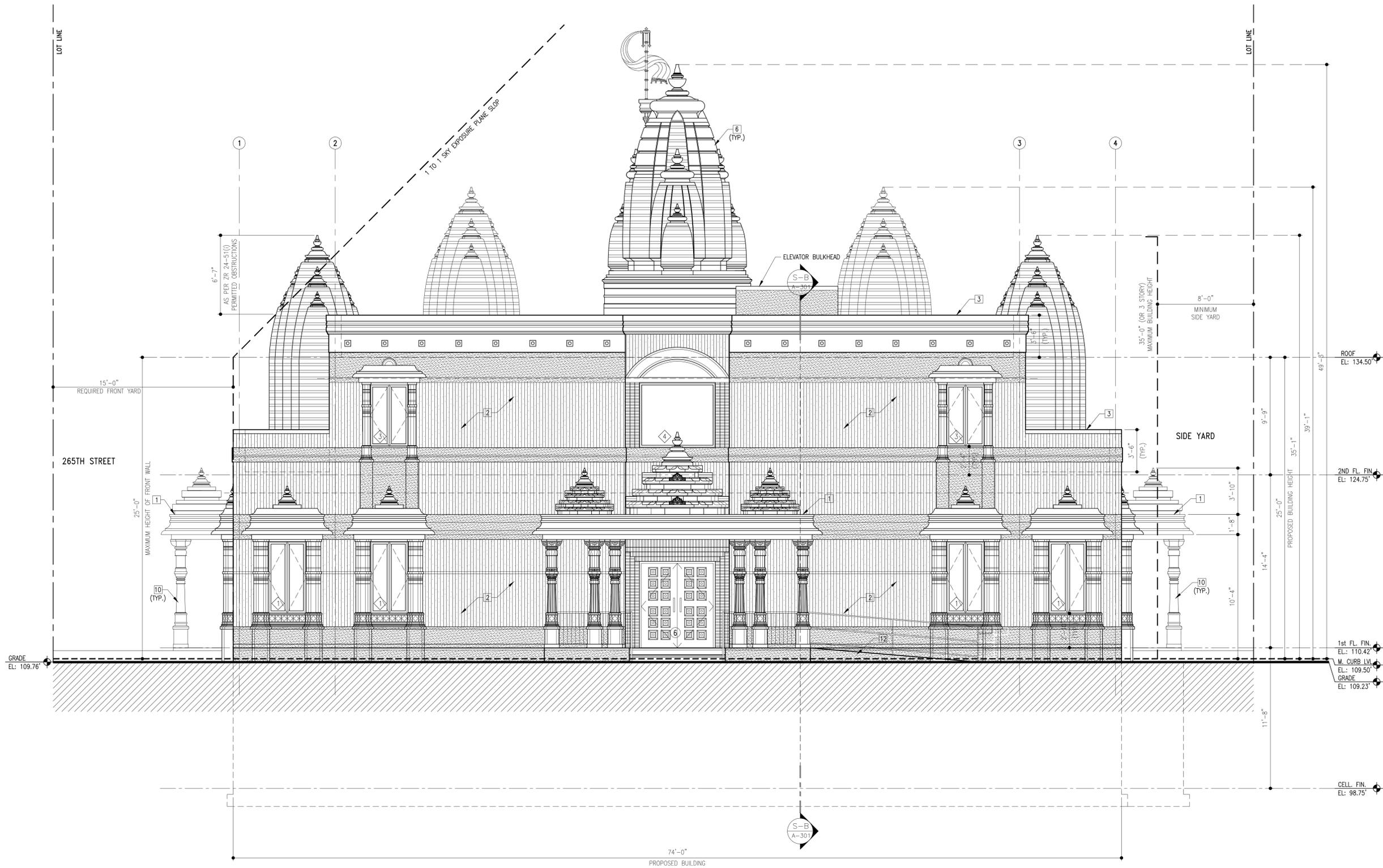
DOB STAMP & SIGNATURE:

PROJECT:  
 PROPOSED 2-STY AND CELLAR TEMPLE W/  
 CARETAKER'S APARTMENT AND RECTORY  
 264-16 HILLSIDE AVENUE,  
 GLEN OAKS, NY 11004

TITLE:  
**SECOND FLOOR PLAN  
 (RECTORY)**

SEAL & SIGNATURE: DATE: 10.16.14  
 PROJECT NO.: MSS-630  
 DRAWING BY: AC  
 CHK. BY: MSS  
 DWG. NO.:  
**A-102.00**  
 CAD FILE NO: 13 OF 37  
 Z: 1-MSS





**E 1** NORTH ELEVATION  
**A200** SCALE: 1/4"=1'-0"

ELEVATION KEY LEGEND	
1	DECORATIVE CANOPY WITH MINARETS OVER MAIN ENTRANCE/EXIT.
2	DRYVIT STUCCO OVER MASONRY WALL. SEE WALL SECTIONS FOR CONSTRUCTION AND NOTES.
3	CONTINUOUS ALUMINUM COPING OVER PARAPET WALL, BY NORTHCLAD OR SIMILAR.
4	42" HIGH GUARDRAIL. SEE DETAILS FOR GUARDRAIL CONSTRUCTION AND ATTACHMENT.
5	CONCRETE STAIR FROM GRADE TO CELLAR.
6	NEW FRAME AND FIBRE GLASS MINARET. (REFER STRUCTURAL DWGS. FOR EXACT SPECIFICATIONS).
7	DECORATIVE LIGHT FIXTURE (STYLE TO BE COORDINATED W/ ARCHITECT).
8	NEW PICTURE (FIX) WINDOW (SEE WINDOW SCHEDULE).
9	NEW CASEMENT WINDOW (SEE WINDOW SCHEDULE).
10	DECORATIVE COLUMN ENCLOSURE (TYPICAL).
11	HANDICAP RAMP WITH SLOPE 1:12

**CONSULTANTS:**

STRUCTURAL:

MEP/FA/PPP/FS:

GEOTECH:

NO.	DATE	DESCRIPTION OF REVISION
06-24-15		AS PER DOB OBJECTIONS

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**Mss**  
**M.S. SAVANI ARCHITECT, PC**

148-45, HILLSIDE AVENUE  
SUITE 201  
JAMAICA, NY 11435  
TEL: 718.657.6222  
FAX: 718.657.6226  
mss@mssarch.com

CLIENT:  
**SHIV SHAKTI PEETH**  
(HINDU TEMPLE)

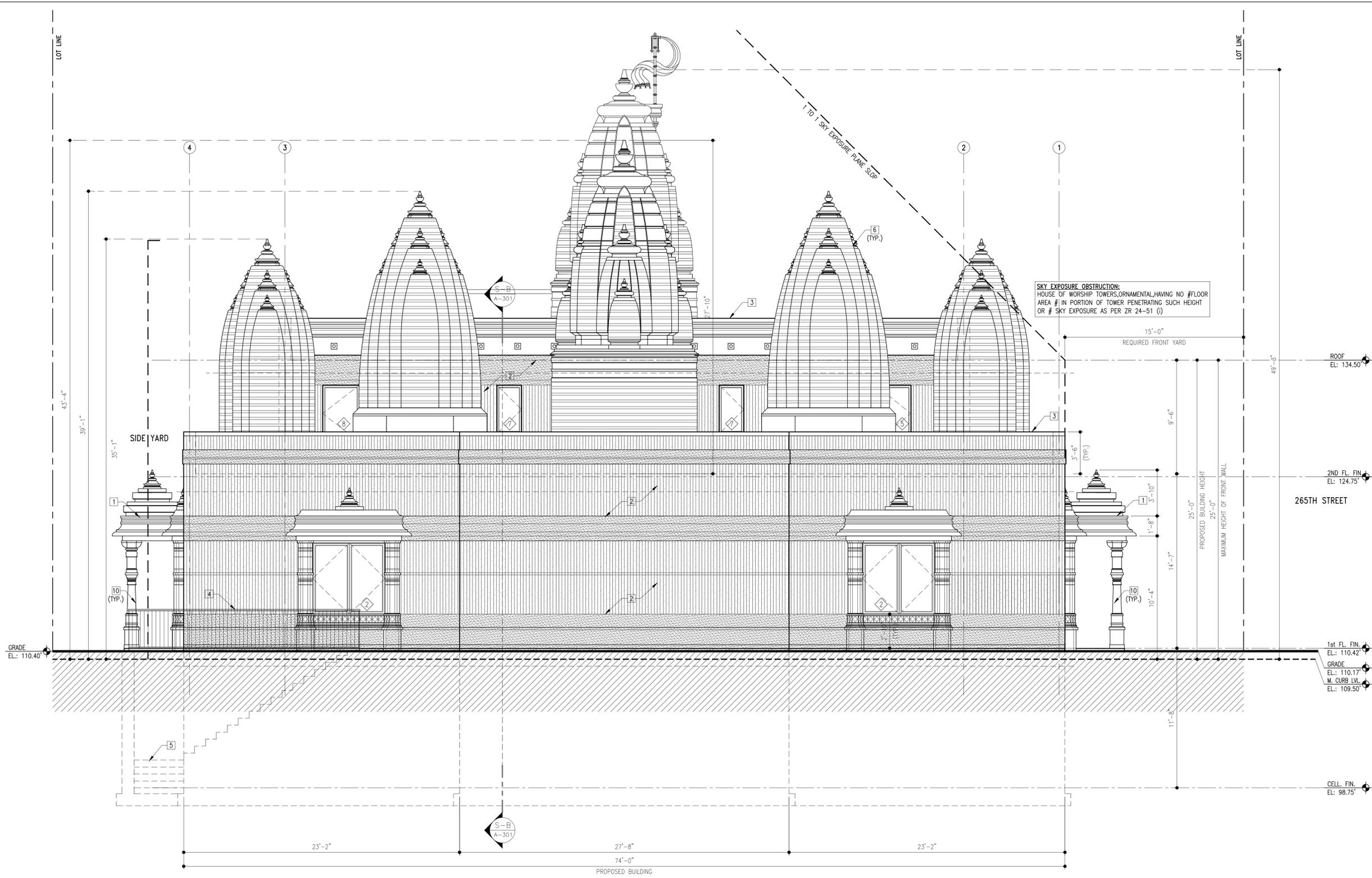
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PROJECT:  
**PROPOSED 2-STY AND CELLAR TEMPLE W/  
CARETAKER'S APARTMENT AND RECTORY**  
264-16 HILLSIDE AVENUE,  
GLEN OAKS, NY 11004

TITLE:  
**NORTH ELEVATION**

SEAL & SIGNATURE:

DATE: 10.16.14  
PROJECT NO.: MSS-630  
DRAWING BY: AC  
CHK. BY: MSS  
DWG. NO.:  
**A-200.00**  
CAD FILE NO: 15 OF 37  
Z: 1-MSS



**E 1 SOUTH ELEVATION**  
 A201 SCALE: 1/4"=1'-0"

ELEVATION KEY LEGEND	
1	- DECORATIVE CANOPY WITH MINARETS OVER MAIN ENTRANCE/EXIT.
2	- DRYVIT STUCCO OVER MASONRY WALL. SEE WALL SECTIONS FOR CONSTRUCTION AND NOTES.
3	- CONTINUOUS ALUMINUM COPING OVER PARAPET WALL, BY NORTHCLAD OR SIMILAR.
4	- 42" HIGH GUARDRAIL. SEE DETAILS FOR GUARDRAIL CONSTRUCTION AND ATTACHMENT.
5	- CONCRETE STAIR FROM GRADE TO CELLAR.
6	- NEW FRAME AND FIBRE GLASS MINARET. (REFER STRUCTURAL DWGS. FOR EXACT SPECIFICATIONS).
7	- DECORATIVE LIGHT FIXTURE (STYLE TO BE COORDINATED W/ ARCHITECT).
8	- NEW PICTURE (FIX) WINDOW (SEE WINDOW SCHEDULE).
9	- NEW CASEMENT WINDOW (SEE WINDOW SCHEDULE).
10	- DECORATIVE COLUMN ENCLOSURE (TYPICAL).
11	- HANDICAP RAMP WITH SLOPE 1:12

**CONSULTANTS:**

STRUCTURAL:

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**M.S. SAVANI ARCHITECT, PC**

148-45, HILLSIDE AVENUE  
 SUITE 201  
 JAMAICA, NY 11435  
 TEL: 718.657.6222  
 FAX: 718.657.6226  
 mss@mssarch.com

CLIENT:  
 SHIV SHAKTI PEETH  
 (HINDU TEMPLE)

DOB STAMP & SIGNATURE:

PROJECT:  
 PROPOSED 2-STY AND CELLAR TEMPLE W/  
 CARETAKER'S APARTMENT AND RECTORY  
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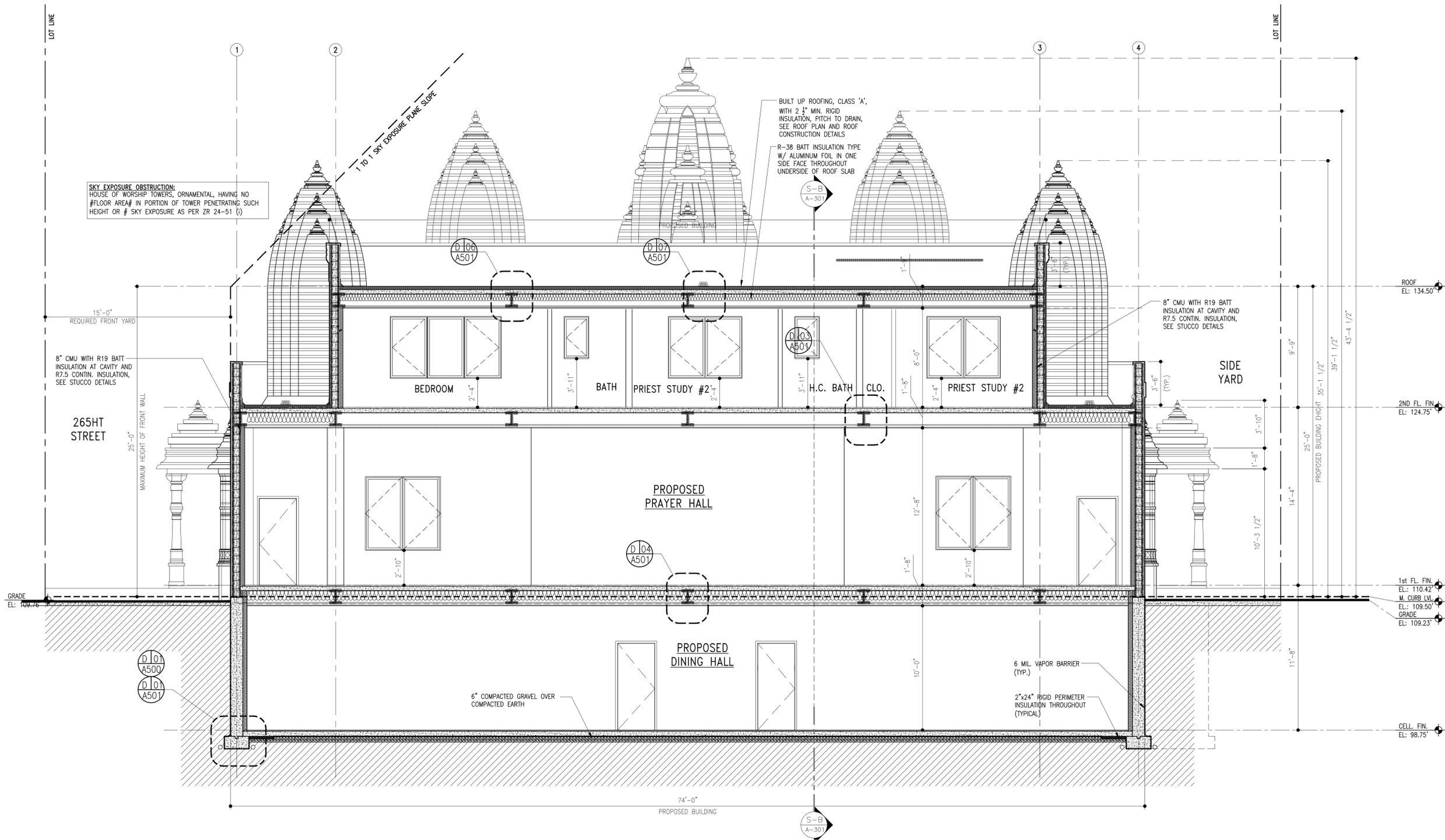
TITLE:  
**SOUTH ELEVATION**

SEAL & SIGNATURE:

DATE: 10.16.14  
 PROJECT NO.: MSS-630  
 DRAWING BY: AC  
 CHK. BY: MSS  
 DWG. NO.:  
**A-201.00**  
 CAD FILE NO: 16 OF 37  
 Z: 1-MSS







SKY EXPOSURE OBSTRUCTION:  
HOUSE OF WORSHIP TOWERS, ORNAMENTAL, HAVING NO  
# FLOOR AREA# IN PORTION OF TOWER PENETRATING SUCH  
HEIGHT OR # SKY EXPOSURE AS PER ZR 24-51 (f)

BUILT UP ROOFING, CLASS 'A',  
WITH 2 1/2" MIN. RIGID  
INSULATION, PITCH TO DRAIN,  
SEE ROOF PLAN AND ROOF  
CONSTRUCTION DETAILS

R-38 BATT INSULATION TYPE  
W/ ALUMINUM FOIL IN ONE  
SIDE FACE THROUGHOUT  
UNDERSIDE OF ROOF SLAB

8" CMU WITH R19 BATT  
INSULATION AT CAVITY AND  
R7.5 CONTIN. INSULATION,  
SEE STUCCO DETAILS

8" CMU WITH R19 BATT  
INSULATION AT CAVITY AND  
R7.5 CONTIN. INSULATION,  
SEE STUCCO DETAILS

**SECTION 'A'**  
SCALE: 1/4"=1'-0"

CONSULTANTS:

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**Mss**  
**M.S. SAVANI ARCHITECT, PC**

148-45, HILLSIDE AVENUE  
SUITE 201  
JAMAICA, NY 11435  
TEL: 718.657.6222  
FAX: 718.657.6226  
mss@mssarch.com

CLIENT:  
SHIV SHAKTI PEETH  
(HINDU TEMPLE)

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PROJECT:  
PROPOSED 2-STY AND CELLAR TEMPLE W/  
CARETAKER'S APARTMENT AND RECTORY  
264-16 HILLSIDE AVENUE,  
GLEN OAKS, NY 11004

TITLE:  
**SECTION 'A'**

SEAL & SIGNATURE:

DATE: 10.16.14  
PROJECT NO.: MSS-630  
DRAWING BY: AC  
CHK. BY: MSS  
DWG. NO.:  
**A-300.00**  
CAD FILE NO: 19 OF 37  
Z: 1-MSS

**CONSULTANTS:**

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**M.S. SAVANI ARCHITECT, PC**

148-45, HILLSIDE AVENUE  
SUITE 201  
JAMAICA, NY 11435  
TEL: 718.657.6222  
FAX: 718.657.6226  
mss@mssarch.com

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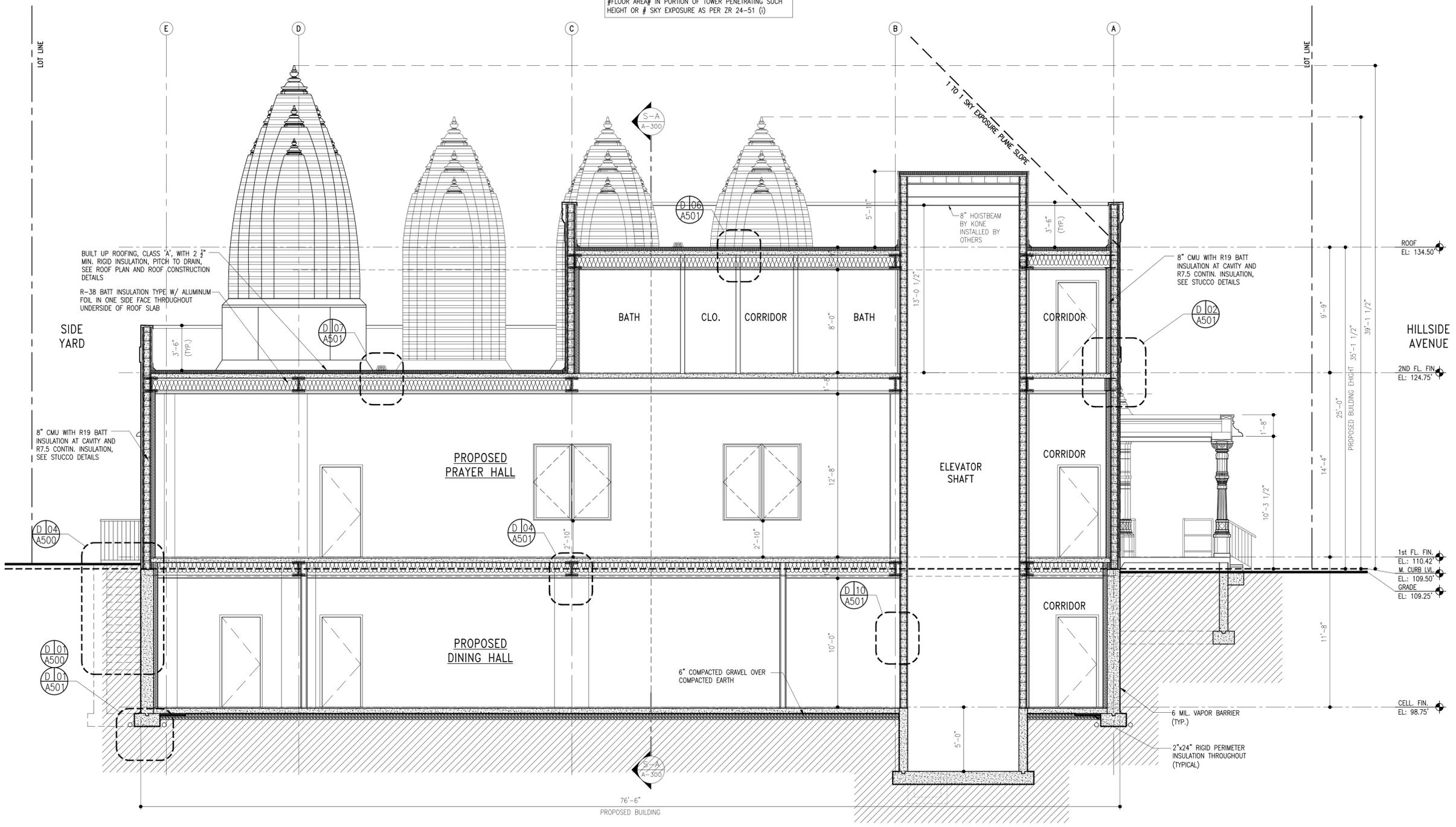
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PROJECT:  
PROPOSED 2-STY AND CELLAR TEMPLE W/  
CARETAKER'S APARTMENT AND RECTORY  
264-16 HILLSIDE AVENUE,  
GLEN OAKS, NY 11004

TITLE:  
**SECTION 'B'**

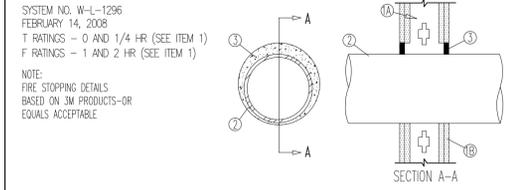
SEAL & SIGNATURE: DATE: 10.16.14  
PROJECT NO.: MSS-630  
DRAWING BY: AC  
CHK. BY: MSS  
DWG. NO.:  
**A-301.00**  
CAD FILE NO: 20 OF 37  
Z: 1-MSS

SKY EXPOSURE OBSTRUCTION:  
HOUSE OF WORSHIP TOWERS, ORNAMENTAL, HAVING NO  
#FLOOR AREA# IN PORTION OF TOWER PENETRATING SUCH  
HEIGHT OR # SKY EXPOSURE AS PER ZR 24-51 (i)



**S/B** SECTION 'B'  
A301 SCALE: 1/4"=1'-0"

**01 WALL PIPE PENETRATION DETAIL SCALE: N.T.S.**



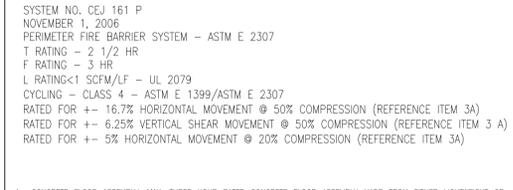
SYSTEM NO. W-1-1296  
 FEBRUARY 14, 2008  
 F RATING - 0 AND 1/4 HR (SEE ITEM 1)  
 F RATING - 1 AND 2 HR (SEE ITEM 1)  
 NOTE:  
 FIRE STOPPING DETAILS  
 BASED ON 3M PRODUCTS-OR  
 EQUALS ACCEPTABLE

- WALL ASSEMBLY - THE 1 OR 2 HR FIRE RATED GYPSUM BOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300, U400 OR V400 SERIES WALL AND PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
  - STUDS - WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER SPACED 16 IN. (406 MM) OC. STEEL STUDS TO BE MIN 3-1/2 IN. (89 MM) WIDE SPACED MAX 24 IN. (610 MM) OC.
  - GYPSUM BOARD\*\* - THE GYPSUM BOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300, U400 OR V400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DAM OF OPENING IS 10-5/8 IN. (270 MM).
  - STEEL SLEEVE\* - (OPTIONAL, NOT SHOWN) - CYLINDRICAL SLEEVE FABRICATED FROM MIN 0.019 IN. THICK (0.48 MM) GALV SHEET STEEL AND HAVING A MIN 2 IN. (51 MM) LAP ALONG THE LONGITUDINAL SEAM. LENGTH OF STEEL SLEEVE TO BE EQUAL TO THICKNESS OF WALL SLEEVE INSTALLED BY COILING THE SHEET STEEL TO A DAM SMALLER THAN THE THROUGH OPENING, INSERTING THE COIL THROUGH THE OPENINGS AND RELEASING THE COIL TO LET IT UNCOIL AGAINST THE CIRCULAR CUTOUTS IN THE GYPSUM WALLBOARD LAYERS.

- THROUGH PENETRANTS - ONE METALLIC PIPE, CONDUIT, TUBING OR FLEXIBLE METAL PIPE INSTALLED CONCENTRICALLY OR ECCENTRICALLY WITHIN OPENING. ANNUAL SPACE BETWEEN PENETRANT AND PERIPHERY OF OPENING TO BE MIN 0 IN. (0 MM) POINT CONTACT TO MAX 2 IN. (51 MM). PENETRANT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL. THE FOLLOWING TYPES AND SIZES OF PENETRANT MAY BE USED:
  - STEEL PIPE - NOM 8 IN. (203 MM) DIAM (OR SMALLER) SCHEDULE 40 (OR HEAVIER) STEEL PIPE.
  - IRON PIPE - NOM 8 IN. (203 MM) DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
  - CONDUIT - NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING (EMT) OR NOM 6 IN. (152 MM) RIGID STEEL CONDUIT.
  - COPPER TUBING - NOM 4 IN. (102 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
  - COPPER PIPE - NOM 4 IN. (102 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
  - THROUGH PENETRATING PRODUCT\*\* - FLEXIBLE METAL PIPING - THE FOLLOWING TYPES OF STEEL FLEXIBLE METAL GAS PIPING MAY BE USED:
    - NOM 2 IN. (51 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. OMEGA FLEX INC.
    - NOM 1 IN. (25 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. CASTLE, DIX, TITELUX.
    - NOM 1 IN. (25 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. WARD MFG INC.
  - FILL, VOID OR CAVITY MATERIAL\* - CAULK OR SEALANT - MIN 5/8 IN. (16 MM) THICKNESS OF CAULK APPLIED WITHIN ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. MIN 1/4 IN. (6 MM) DIAM BEAD OF CAULK APPLIED TO GYPSUM BOARD/PENETRANT INTERFACE AT POINT CONTACT LOCATION ON BOTH SIDES OF WALL.

3M COMPANY - IC 15M6, CP 25M6 CAULK OR FB-3000 WT SEALANT  
 \*BEARING THE UL CLASSIFICATION MARK

**02 PERIMETER FIRE BARRIER SYSTEM DETAIL SCALE: N.T.S.**

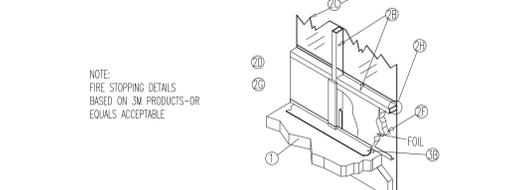


SYSTEM NO. CEJ 161 P  
 NOVEMBER 1, 2008  
 PERIMETER FIRE BARRIER SYSTEM - ASTM E 2307  
 T RATING - 2 1/2 HR  
 F RATING - 3 HR  
 L RATING-1 SCFM/LF - UL 2079  
 CYCLING - CLASS 4 - ASTM E 1399/ASTM E 2307  
 RATED FOR +- 16.7% HORIZONTAL MOVEMENT @ 50% COMPRESSION (REFERENCE ITEM 3A)  
 RATED FOR +- 6.25% VERTICAL SHEAR MOVEMENT @ 50% COMPRESSION (REFERENCE ITEM 3 A)  
 RATED FOR +- 5% HORIZONTAL MOVEMENT @ 20% COMPRESSION (REFERENCE ITEM 3A)

- CONCRETE FLOOR ASSEMBLY: MAX, THREE-HOUR RATED CONCRETE FLOOR ASSEMBLY MADE FROM EITHER LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE WITH A DESTINY OF 100-150 PCF, WITH A MIN. THICKNESS OF 4-1/2-IN. AT THE JOINT FACE. OVERLAP SLAB THICKNESS MAY VARY TO ACCOMMODATE VARIOUS BLOCKOUT DEPTHS (LONGITUDINAL RECESSES) FORMED IN THE CONCRETE, TO HOUSE THE ARCHITECTURAL COVER PLATE. THE BLOCKOUT WIDTH MAY ALSO VARY WITHOUT RESTRICTION.
- CURTAIN WALL ASSEMBLY: THE CURTAIN WALL ASSEMBLY SHALL INCORPORATE THE FOLLOWING CONSTRUCTION FEATURES:
  - MOUNTING ATTACHMENT: (NOT SHOWN) ATTACHMENT OF THE CURTAIN WALL FRAMING TO THE STRUCTURAL FRAMING SHALL BE ACCORDING TO THE CURTAIN WALL MANUFACTURER'S INSTRUCTIONS. WHEN REQUIRED, THE MOUNTING ATTACHMENTS TO THE FLOOR SLAB SHALL BE CONNECTED TO THE JOINT FACE OF THE FLOOR SLAB, ACCORDING TO THE CURTAIN WALL MANUFACTURER'S INSTRUCTIONS. MAX. DISTANCE BETWEEN MOUNTING ATTACHMENTS SHALL BE 10 FEET.
  - ALUMINUM FRAMING: RECTANGULAR ALUMINUM TUBING MILLIONS AND TRANSOMS, SIZED ACCORDING TO THE CURTAIN WALL SYSTEM MANUFACTURER'S GUIDELINES. MIN. OVERALL DIMENSIONS OF FRAMING REQUIRED IS 0.100 IN. THICK ALUMINUM WITH A MIN. 5-1/2 IN. HEIGHT AND A MIN. OF 2-1/2 IN. WIDTH OF THE EXTRUSION. MILLION AND TRANSOM COVERS ARE ADDED TO THE EXTERIOR SIDE OF THE FRAMING, GIVING THE FRAMING SYSTEM A TOTAL DEPTH OF NOM. 2 IN. MILLIONS ARE TO BE SPACED A MIN. 60 IN. O.C. AND TRANSOMS ARE TO BE SPACED A MIN. 48 IN. O.C. TRANSOMS ARE TO BE LOCATED AT A HEIGHT OF 20 IN. ABOVE THE TOP SURFACE OF THE CONCRETE FLOOR ASSEMBLY (AS MEASURED FROM THE BOTTOM OF THE TRANSOM).
  - GLASS PANELS: GLASS PANELS SHALL BE SIZED AND INSTALLED TO CURTAIN WALL FRAMING ACCORDING TO THE CURTAIN WALL SYSTEM MANUFACTURER'S GUIDELINES. USE A MIN. 1/4 IN. THICK CLEAR, HEATSTRENGTHENED (HS) GLASS OR TEMPLERED GLASS WITH A MAX. WIDTH AND HEIGHT LESS THAN THE ALUMINUM FRAMING O.C. SPACING, WHICH ALLOWS THE GLASS TO BE SECURED BETWEEN THE NOTCHED SHOULDER OF THE ALUMINUM FRAMING AND PRESSURE BAR. PANELS ARE SECURED WITH A THERMAL BREAK (RUBBER EXTRUSION), PRESSURE BAR (ALUMINUM EXTRUSION), MIN. 1/4-20 X 5/8 IN. LONG SCREWS, AND A SNAP FACE (ALUMINUM EXTRUSION).
  - IMPALING PINS: MIN. 12 GA STEEL PINS SHALL BE LOCATED, SIZED AND INSTALLED ACCORDING TO THE CURTAIN WALL SYSTEM MANUFACTURER'S GUIDELINES, OR BE A MIN. 1/2 IN. LONGER THAN THE THICKNESS OF THE CURTAIN WALL INSULATION. ATTACH PINS TO A NOM. 2 IN. BY 2 IN. CLIP ANGLE CONSTRUCTED WITH 20 GA GALVANIZED SHEET STEEL AND SECURE THE CLIPS TO THE ALUMINUM FRAMING WITH NO. 10 SELF-TAPPING SHEET METAL SCREWS. PINS SHALL BE SPACED A MAX. OF 12 IN. O.C. ON THE VERTICAL FRAMING MEMBERS AND A MAX. OF 20 IN. O.C. ON THE HORIZONTAL FRAMING MEMBERS THAT MAKE UP THE PERIMETER OF THE SPANDREL AREA. THE INTERIOR FACE OF THE CURTAIN WALL INSULATION IS TO BE INSTALLED SO THAT IT IS FLUSH WITH THE INTERIOR FACE OF THE FRAMING.
  - REINFORCING ANGLE: MOUNT A MIN. 1-1/2 IN. X 1-1/2 IN. X 20 GA GALVANIZED STEEL ANGLE TO THE VERTICAL FRAMING MEMBERS SO THAT THE VERTICAL LEG SEVES AS A BACKER TO THE EXTERIOR FACE OF THE CURTAIN WALL INSULATION AND THE HORIZONTAL LEG EXTENDS AWAY FROM THE CURTAIN WALL INSULATION AND THE ELEVATION IS LOCATED AT THE CENTERLINE OF THE PERIMETER JOINT TREATMENT. SIZE THE ANGLE 12 IN. LONGER THAN THE SPAN BETWEEN THE INTERIOR EDGES OF THE VERTICAL FRAMING MEMBERS AND FORM THE ANGLE SO THAT IT HAS A 6 IN. VERTICAL LEG ON EACH END. SECURE THE 6 IN. LEG TO THE FRAMING MEMBER ON EACH SIDE WITH THREE NO. 10 STEEL SELF-TAPPING SHEET METAL SCREWS PLACED IN A TRIANGULAR FASHION WITH A MAX. SPACING OF 2 IN. O.C.
  - CURTAIN WALL INSULATION: INSTALL NOM. 2 IN. THICK 8 PCF DENSITY MINERAL WOOL BATT INSULATION FACED ON ONE SIDE WITH ALUMINUM FOIL SCUM (VAPOR RETARDER) WHICH IS EXPOSED TO THE ROOM INTERIOR. SECURE WITH ANGLE CLIPS AND IMPALING PINS (20). ALL MEETING EDGES OF INSULATION ARE SEALED WITH NOM. 4 IN. WIDE, PRESSURE SENSITIVE ALUMINUM FOIL TAPE (FACED) TAPE CENTERED OVER THE JUNCTION SO THAT APPROX. 2 IN. OF TAPE COVERS EACH EDGE OF THE ADJACENT INSULATION. IN LEU OF THE NOM. 2 IN. 8 PCF MINERAL WOOL CURTAIN WALL INSULATION, NOM 3 IN. 6 PCF OR NOM 4 IN. 4 PCF MINERAL WOOL MAY BE INSTALLED USING THE SAME SECURING METHOD DESCRIBED IN ITEM 20. THE INTERIOR FACE OF THE BATT INSULATION IS, IF REQUIRED COMPRESSED, FLUSH WITH THE INTERIOR FACE OF THE CURTAIN WALL FRAMING. WHEN USING NOM. 2 IN. THICK 8 PCF DENSITY MINERAL WOOL BATT INSULATION A MIN. 1-1/4-IN. AIR SPACE IS CREATED BETWEEN THE INSULATION AND PANEL. THE BATT INSULATION SHALL BE INSTALLED WITHOUT VERTICAL SEAMS, WITH A CONTINUOUS SPIN ACROSS THE FULL LENGTH BETWEEN THE VERTICAL CURTAIN WALL FRAMING MEMBERS. HORIZONTAL SEAMS IN THE NOM. 24-INCH WIDE BATT INSULATION ARE TO BE AT LEAST 6 IN. FROM THE TOP SURFACE OF THE PERIMETER JOINT TREATMENT.

ONLY INTERTEK CERTIFIED MINERAL WOOL MANUFACTURER'S PRODUCT MEETING THE ABOVE MINIMUM REQUIREMENTS.  
 LISTED MANUFACTURER:  
 ONLY INTERTEK CERTIFIED MINERAL WOOL MANUFACTURER'S PRODUCT MEETING THE ABOVE MINIMUM REQUIREMENTS.

**03 METALLIC PIPES PENETRATION DETAIL SCALE: N.T.S.**



SYSTEM NO. C-AJ-8088  
 NOVEMBER 1, 2004  
 F RATING - 0 HR  
 T RATING - 2 1/2 HR  
 F RATING - 3 HR  
 NOTE:  
 FIRE STOPPING DETAILS  
 BASED ON 3M PRODUCTS-OR  
 EQUALS ACCEPTABLE

- FLOOR OR WALL ASSEMBLY - MIN 4-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS\*. MAX AREA OF OPENING IS 144 SQ IN. WITH A MAX DIMENSION OF 18 IN. SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.
- THROUGH PENETRANTS - METALLIC PIPES, TUBING OR CABLE TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. PENETRANTS TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF PENETRANTS MAY BE USED:
  - METALLIC PIPES - MAX FIVE METALLIC PIPES OR TUBING. THE ANNUAL SPACE BETWEEN UNSULATED PENETRANT AND PERIPHERY OF OPENING SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 2-3/4 IN. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR TUBING MAY BE USED:
    - COPPER TUBING - NOM 3 IN. DIAM (OR SMALLER) TYPE M (OR HEAVIER) COPPER TUBE.
    - COPPER PIPE - NOM 3 IN. DIAM (OR SMALLER) REGULAR (HEAVIER) COPPER PIPE.
    - TUBE INSULATION - PLASTICS+ - NOM 1 IN. THICK ACRYLONITRILE BUTADIENE/POLYVINYL CHLORIDE (AB/PVC) FLEXIBLE FOAM FURNISHED IN THE FORM OF TUBING. THE TUBE INSULATION SHALL BE INSTALLED ON ALL TUBING GREATER THAN NOM 2 IN. DIAM. THE ANNUAL SPACE BETWEEN THE INSULATED PENETRATING ITEM AND UNSULATED METALLIC PIPES, CONDUIT OR TUBING SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 1-1/4 IN. THE ANNUAL SPACE BETWEEN THE INSULATED PENETRATING ITEM AND THE PERIPHERY OF THE OPENING SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 2-3/4 IN.
  - SEALANT - FIRESTOP SYSTEM SHALL BE AS FOLLOWS:
    - FILL, VOID OR CAVITY MATERIALS\* - WRAP STRIP - NOM 1/8 IN. THICK INTUMESCENT MATERIAL SUPPLIED IN 2 IN. WIDE STRIPS. MIN ONE LAYER OF WRAP STRIP WRAPPED AROUND PENETRANTS AND PIPE INSULATION AND SECURED IN PLACE WITH THE TOP SURFACE OF THE FLOOR OR SLAB AND RECESSED WITHIN THE OPENING NOT MORE THAN 2 IN. ABOVE THE BOTTOM OF THE FLOOR. WRAP STRIP REQUIRED AROUND INSULATED PENETRANTS WHICH MAY BE TIGHTLY BUNDLED TOGETHER. WRAP STRIP ALSO REQUIRED TO BE INSTALLED AROUND INSULATED PENETRANTS WHEN INSTALLED LESS THAN 1/2 IN. FROM UNSULATED TUBES OR CABLES. IN SUCH CASES WHERE INSULATED PENETRANT IS AT POINT CONTACT WITH UNSULATED TUBES OR CABLES, WRAP STRIP TO BE WEDGED BETWEEN INSULATION AND UNSULATED TUBE OR CABLE BY COMPRESSING INSULATION. WRAP STRIP NOT REQUIRED AROUND INSULATED TUBES INSTALLED 1/2 IN. OR GREATER FROM OTHER PENETRANTS.
    - 3M COMPANY - ULTRA GS

3M COMPANY - ULTRA GS  
 \*BEARING THE UL CLASSIFICATION MARK

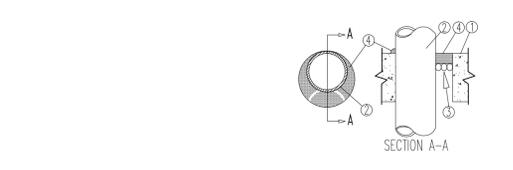
**05 METALLIC PIPE PENETRATION DETAIL SCALE: N.T.S.**



SYSTEM NO. C-AJ-1044  
 MARCH 15, 2007  
 F RATING - 0 HR  
 F RATING - 2, 3 AND 4 HR (SEE ITEMS 2A AND 4)  
 L RATING AT AMBIENT - 2 CFM/SQ FT  
 L RATING AT 4000F - LESS THAN 1 CFM/SQ FT  
 W RATING - CLASS 1 (SEE ITEM 4)  
 NOTE:  
 FIRE STOPPING DETAILS  
 BASED ON 3M PRODUCTS-OR EQUALS ACCEPTABLE

- FLOOR OR WALL ASSEMBLY - LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF OR 1600-2400 KG/M3) CONCRETE. EXCEPT AS NOTED IN TABLE UNDER ITEM 4, MIN THICKNESS OF SOLID CONCRETE FLOOR OR WALL ASSEMBLY IS 4-1/2 IN. (114 MM). FLOOR ASSEMBLY MAY ALSO BE CONSTRUCTED OF ANY MIN. (152 MM) THICK UL CLASSIFIED HOLLOW CORE PRECAST CONCRETE UNITS\*. WHEN FLOOR IS CONSTRUCTED OF HOLLOW CORE PRECAST CONCRETE UNITS, PACKING MATERIAL (ITEM 3) AND CAULK FILL MATERIAL (ITEM 4) TO BE INSTALLED SYMMETRICALLY ON BOTH SIDES OF FLOOR AND FLUSH WITH FLOOR SURFACE. WALL ASSEMBLY MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS\*. MAX DAM OF OPENING IN SOLID LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR IS 32 IN. (813 MM). MAX DAM OF OPENING IN FLOOR CONSTRUCTED OF HOLLOW-CORE PRECAST CONCRETE UNITS IS 7 IN. (178 MM).
- THROUGH PENETRANTS - ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. MAX ANNUAL SPACE BETWEEN PIPE, CONDUIT OR TUBING AND EDGE OF THROUGH OPENING OR SLEEVE IS DEPENDENT ON THE PARAMETERS SHOWN IN ITEM 4. MIN ANNUAL SPACE BETWEEN PIPE OR CONDUIT AND EDGE OF THROUGH OPENING IS 0 IN. (POINT CONTACT). MAX ANNUAL SPACE TO BE AS SHOWN IN THE TABLE IN ITEM 4. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:
  - STEEL PIPE - NOM 30 IN. (762 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
  - IRON PIPE - NOM 30 IN. (762 MM) DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
  - CONDUIT - NOM 6 IN. (152 MM) DIAM (OR SMALLER) RIGID STEEL CONDUIT.
  - CONDUIT - NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING.
  - COPPER TUBING - NOM 6 IN. (152 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBE.
  - COPPER PIPE - NOM 6 IN. (152 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

3M COMPANY - CP 25M6 + OR FB-3000 WT.  
 (NOTE: W RATING APPLIES ONLY WHEN FB-3000 WT IS USED.)  
 \*BEARING THE UL CLASSIFICATION MARK

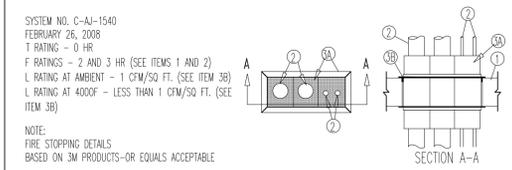


SYSTEM NO. C-AJ-1540  
 FEBRUARY 26, 2008  
 F RATING - 0 HR  
 F RATING - 2 AND 3 HR (SEE ITEMS 1 AND 2)  
 L RATING AT AMBIENT - 1 CFM/SQ FT. (SEE ITEM 3B)  
 L RATING AT 4000F - LESS THAN 1 CFM/SQ FT. (SEE ITEM 3B)  
 NOTE:  
 FIRE STOPPING DETAILS  
 BASED ON 3M PRODUCTS-OR EQUALS ACCEPTABLE

- FLOOR OR WALL ASSEMBLY - MIN 2-1/2 IN. (64 MM) THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF OR 1600-2400 KG/M3) CONCRETE REQUIRED FOR 2 HR F RATING. MIN 4-1/2 IN. (114 MM) THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF OR 1600-2400 KG/M3) CONCRETE REQUIRED FOR 3 HR F RATING. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS\*. MAX AREA OF OPENING IS 56 IN.2 (363 CM2) WITH A MAX DIMENSION OF 12-1/2 IN. (318 MM) FOR SQUARE DEVICES. MAX DAM OF OPENING IS 2-1/2 IN. (64 MM) FOR NOM 2 IN. (51 MM) ROUND DEVICES AND 4-1/2 IN. (114 MM) FOR NOM 4 IN. (102 MM) ROUND DEVICES. SEE CONCRETE BLOCKS (CAZT) CATEGORY IN FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.
- THROUGH PENETRANTS - ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN EACH FIRESTOP DEVICE (ITEM 3A). IF MULTIPLE THROUGH PENETRANTS ARE INSTALLED WITHIN THE OPENING DEVICE, THROUGH PENETRANTS MAY BE BUNDLED TOGETHER. THROUGH PENETRANTS TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF THROUGH PENETRANTS MAY BE USED:
  - STEEL PIPE - NOM 3 IN. (76 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
  - IRON PIPE - NOM 3 IN. (76 MM) DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
  - COPPER TUBING - NOM 3 IN. (76 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBE.
  - CONDUIT - NOM 3 IN. (76 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
  - THROUGH-PENETRATING PRODUCT\*\* - FLEXIBLE METAL PIPING - NOM 1-1/4 IN. (32 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL PIPING.

OMEGA FLEX INC. - TRACPIPE FLEXIBLE GAS PIPING  
 THE F RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE MAX NOM DIAM OF THE THROUGH PENETRANT. IF THE MAX NOM DIAM IS NOM 1-1/4 IN. OR LESS, THE F RATING IS 3 HR. IF THE MAX NOM DIAM IS GREATER THAN 1-1/2 IN., THE F RATING IS 2 HR.  
 3. FIRESTOP SYSTEM - THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:  
 A. FIRESTOP DEVICE\* - A MAX OF THREE SQUARE FIRESTOP DEVICES MAY BE GANGED TOGETHER. AS AN ALTERNATE ONE ROUND DEVICE MAY BE CENTERED WITHIN A ROUND OPENING. EACH DEVICE CONISTED OF A NOM 2-1/2 BY 2-1/2 BY 10 IN. (64 BY 64 BY 254 MM), OR A NOM 4 BY 4 BY 10 IN. (102 BY 102 BY 254 MM), A NOM 2 IN. (51 MM) DIAM BY 10 IN. (254 MM) OR A NOM 4 IN. (102 MM) DIAM BY 10 IN. PAINTED STEEL TRANSIT INCORPORATING INTERNAL INTUMESCENT MATERIAL, FOAM PLUGS AND MOUNTING FLANGES. IN NOM 2-1/2 BY 2-1/2 IN. (64 BY 64 MM) DEVICES, THE MAX DAM OF THE THROUGH PENETRANT (ITEM 2) SHALL NOT EXCEED 1-1/4 IN. (32 MM). FIRESTOP DEVICE TO BE CENTERED WITHIN OPENING AND INSTALLED WITH ENDS PROJECTING AN EQUAL DISTANCE BEYOND EACH SURFACE OF THE FLOOR OR WALL ASSEMBLY IN ACCORDANCE WITH THE ACCOMPANYING INSTALLATION INSTRUCTIONS. THE ANNUAL SPACE BETWEEN THE FIRESTOP DEVICES(S) AND THE PERIPHERY OF THE OPENING SHALL BE 0 IN. (POINT CONTACT) TO MAX 1/4 IN. (6 MM). FIRESTOP DEVICES SECURED IN PLACE BY MEANS OF FILL MATERIAL (ITEM 3B) AND STEEL SPURT MOUNTING FLANGES SIZED TO ACCOMMODATE THE FIRESTOP DEVICE - STEEL SPURT MOUNTING FLANGES INSTALLED ON BOTH SIDES OF FLOOR OR WALL AFTER INSTALLATION OF FILL MATERIAL AND SEALED TOGETHER WITH SUPPLIED STEEL SET SCREWS. NOM 1 IN. (25 MM) THICK FOAM PLUGS CUT TO ACCOMMODATE THE THROUGH PENETRANT(S) AND INSTALLED FLUSH WITH EACH END OF DEVICE ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.  
 3M COMPANY - 3M FIRE BARRIER PASS - THROUGH DEVICE  
 B. FILL, VOID OR CAVITY MATERIAL\* - CAULK OR SEALANT - MIN 1 IN. (25 MM) THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS BETWEEN THE OUTER PERIMETER OF FIRESTOP DEVICE AND PERIPHERY OF OPENING PRIOR TO THE INSTALLATION OF THE MOUNTING FLANGES. FLUSH WITH TOP SURFACE OF FLOOR OR WITH BOTH SURFACES OF WALL. WHEN THE ANNUAL SPACE IS 1/8 IN. (3.2 MM) OR LESS, THE FILL MATERIAL IN THE ANNULUS IS OPTIONAL. ALSO, AS AN OPTION, FOAM PLUGS MAY BE RECESSED INTO DEVICE AND THE RECESS FILLED WITH PUTTY OR CAULK FLUSH WITH THE TOP SURFACE OF THE FLOOR OR WITH BOTH SURFACES OF WALL. L RATING APPLIES ONLY WHEN THE ANNULUS AT INTERFACE OF FLOOR OR BOTH SIDES OF WALL AND DEVICE(S) PRIOR TO THE INSTALLATION OF THE MOUNTING FLANGES AND WITH BOTH ENDS OF FIRESTOP DEVICE(S) FILLED WITH NOMINAL 1/8 IN. (3.2 MM) OF MOLDABLE PUTTY +.  
 3M COMPANY - MOLDABLE PUTTY+, CP 25M6+, IC 15 W6+, 3000 WT  
 \*BEARING THE UL CLASSIFICATION MARK

**06 STEEL PIPE PENETRATION DETAIL SCALE: N.T.S.**

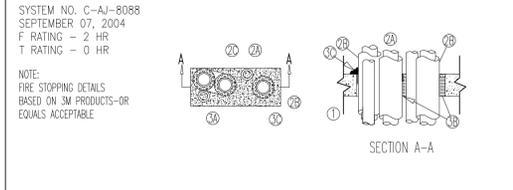


SYSTEM NO. C-AJ-3030  
 MARCH 5, 2007  
 F RATING - 0 HR  
 F RATING - 1-1/2, 2 AND 3 HR (SEE ITEM 5)  
 L RATING AT AMBIENT - 129 CFM/SQ FT  
 L RATING AT 4000F - 92 CFM/SQ FT  
 NOTE:  
 FIRE STOPPING DETAILS  
 BASED ON 3M PRODUCTS-OR EQUALS ACCEPTABLE

- FLOOR OR WALL ASSEMBLY - MIN 2-1/2 IN. (64 MM) THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF OR 1600-2400 KG/M3) CONCRETE. FLOOR ASSEMBLY MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS\*. MAX DAM OF OPENING IS 8 IN. (203 MM). WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS\*. MAX AREA OF OPENING IS 56 IN.2 (363 CM2) WITH A MAX DIMENSION OF 12-1/2 IN. (318 MM) FOR SQUARE DEVICES. MAX DAM OF OPENING IS 2-1/2 IN. (64 MM) FOR NOM 2 IN. (51 MM) ROUND DEVICES AND 4-1/2 IN. (114 MM) FOR NOM 4 IN. (102 MM) ROUND DEVICES. SEE CONCRETE BLOCKS (CAZT) CATEGORY IN FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.
- THROUGH PENETRANTS - ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN EACH FIRESTOP DEVICE (ITEM 3A). IF MULTIPLE THROUGH PENETRANTS ARE INSTALLED WITHIN THE OPENING DEVICE, THROUGH PENETRANTS MAY BE BUNDLED TOGETHER. THROUGH PENETRANTS TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF THROUGH PENETRANTS MAY BE USED:
  - STEEL PIPE - NOM 3 IN. (76 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
  - IRON PIPE - NOM 3 IN. (76 MM) DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
  - COPPER TUBING - NOM 3 IN. (76 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBE.
  - CONDUIT - NOM 3 IN. (76 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
  - THROUGH-PENETRATING PRODUCT\*\* - FLEXIBLE METAL PIPING - NOM 1-1/4 IN. (32 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL PIPING.

OMEGA FLEX INC. - TRACPIPE FLEXIBLE GAS PIPING  
 THE F RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE MAX NOM DIAM OF THE THROUGH PENETRANT. IF THE MAX NOM DIAM IS NOM 1-1/4 IN. OR LESS, THE F RATING IS 3 HR. IF THE MAX NOM DIAM IS GREATER THAN 1-1/2 IN., THE F RATING IS 2 HR.  
 3. FIRESTOP SYSTEM - THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:  
 A. FIRESTOP DEVICE\* - A MAX OF THREE SQUARE FIRESTOP DEVICES MAY BE GANGED TOGETHER. AS AN ALTERNATE ONE ROUND DEVICE MAY BE CENTERED WITHIN A ROUND OPENING. EACH DEVICE CONISTED OF A NOM 2-1/2 BY 2-1/2 BY 10 IN. (64 BY 64 BY 254 MM), OR A NOM 4 BY 4 BY 10 IN. (102 BY 102 BY 254 MM), A NOM 2 IN. (51 MM) DIAM BY 10 IN. (254 MM) OR A NOM 4 IN. (102 MM) DIAM BY 10 IN. PAINTED STEEL TRANSIT INCORPORATING INTERNAL INTUMESCENT MATERIAL, FOAM PLUGS AND MOUNTING FLANGES. IN NOM 2-1/2 BY 2-1/2 IN. (64 BY 64 MM) DEVICES, THE MAX DAM OF THE THROUGH PENETRANT (ITEM 2) SHALL NOT EXCEED 1-1/4 IN. (32 MM). FIRESTOP DEVICE TO BE CENTERED WITHIN OPENING AND INSTALLED WITH ENDS PROJECTING AN EQUAL DISTANCE BEYOND EACH SURFACE OF THE FLOOR OR WALL ASSEMBLY IN ACCORDANCE WITH THE ACCOMPANYING INSTALLATION INSTRUCTIONS. THE ANNUAL SPACE BETWEEN THE FIRESTOP DEVICES(S) AND THE PERIPHERY OF THE OPENING SHALL BE 0 IN. (POINT CONTACT) TO MAX 1/4 IN. (6 MM). FIRESTOP DEVICES SECURED IN PLACE BY MEANS OF FILL MATERIAL (ITEM 3B) AND STEEL SPURT MOUNTING FLANGES SIZED TO ACCOMMODATE THE FIRESTOP DEVICE - STEEL SPURT MOUNTING FLANGES INSTALLED ON BOTH SIDES OF FLOOR OR WALL AFTER INSTALLATION OF FILL MATERIAL AND SEALED TOGETHER WITH SUPPLIED STEEL SET SCREWS. NOM 1 IN. (25 MM) THICK FOAM PLUGS CUT TO ACCOMMODATE THE THROUGH PENETRANT(S) AND INSTALLED FLUSH WITH EACH END OF DEVICE ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.  
 3M COMPANY - 3M FIRE BARRIER PASS - THROUGH DEVICE  
 B. FILL, VOID OR CAVITY MATERIAL\* - CAULK OR SEALANT - MIN 1 IN. (25 MM) THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS BETWEEN THE OUTER PERIMETER OF FIRESTOP DEVICE AND PERIPHERY OF OPENING PRIOR TO THE INSTALLATION OF THE MOUNTING FLANGES. FLUSH WITH TOP SURFACE OF FLOOR OR WITH BOTH SURFACES OF WALL. WHEN THE ANNUAL SPACE IS 1/8 IN. (3.2 MM) OR LESS, THE FILL MATERIAL IN THE ANNULUS IS OPTIONAL. ALSO, AS AN OPTION, FOAM PLUGS MAY BE RECESSED INTO DEVICE AND THE RECESS FILLED WITH PUTTY OR CAULK FLUSH WITH THE TOP SURFACE OF THE FLOOR OR WITH BOTH SURFACES OF WALL. L RATING APPLIES ONLY WHEN THE ANNULUS AT INTERFACE OF FLOOR OR BOTH SIDES OF WALL AND DEVICE(S) PRIOR TO THE INSTALLATION OF THE MOUNTING FLANGES AND WITH BOTH ENDS OF FIRESTOP DEVICE(S) FILLED WITH NOMINAL 1/8 IN. (3.2 MM) OF MOLDABLE PUTTY +.  
 3M COMPANY - MOLDABLE PUTTY+, CP 25M6+, IC 15 W6+, 3000 WT  
 \*BEARING THE UL CLASSIFICATION MARK

**03 METALLIC PIPES PENETRATION DETAIL SCALE: N.T.S.**



SYSTEM NO. C-AJ-8088  
 NOVEMBER 1, 2004  
 F RATING - 0 HR  
 T RATING - 2 1/2 HR  
 F RATING - 3 HR  
 NOTE:  
 FIRE STOPPING DETAILS  
 BASED ON 3M PRODUCTS-OR  
 EQUALS ACCEPTABLE

- FLOOR OR WALL ASSEMBLY - MIN 4-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS\*. MAX AREA OF OPENING IS 144 SQ IN. WITH A MAX DIMENSION OF 18 IN. SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.
- THROUGH PENETRANTS - METALLIC PIPES, TUBING OR CABLE TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. PENETRANTS TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF PENETRANTS MAY BE USED:
  - METALLIC PIPES - MAX FIVE METALLIC PIPES OR TUBING. THE ANNUAL SPACE BETWEEN UNSULATED PENETRANT AND PERIPHERY OF OPENING SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 2-3/4 IN. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR TUBING MAY BE USED:
    - COPPER TUBING - NOM 3 IN. DIAM (OR SMALLER) TYPE M (OR HEAVIER) COPPER TUBE.
    - COPPER PIPE - NOM 3 IN. DIAM (OR SMALLER) REGULAR (HEAVIER) COPPER PIPE.
    - TUBE INSULATION - PLASTICS+ - NOM 1 IN. THICK ACRYLONITRILE BUTADIENE/POLYVINYL CHLORIDE (AB/PVC) FLEXIBLE FOAM FURNISHED IN THE FORM OF TUBING. THE TUBE INSULATION SHALL BE INSTALLED ON ALL TUBING GREATER THAN NOM 2 IN. DIAM. THE ANNUAL SPACE BETWEEN THE INSULATED PENETRATING ITEM AND UNSULATED METALLIC PIPES, CONDUIT OR TUBING SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 1-1/4 IN. THE ANNUAL SPACE BETWEEN THE INSULATED PENETRATING ITEM AND THE PERIPHERY OF THE OPENING SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 2-3/4 IN.
  - SEALANT - FIRESTOP SYSTEM SHALL BE AS FOLLOWS:
    - FILL, VOID OR CAVITY MATERIALS\* - WRAP STRIP - NOM 1/8 IN. THICK INTUMESCENT MATERIAL SUPPLIED IN 2 IN. WIDE STRIPS. MIN ONE LAYER OF WRAP STRIP WRAPPED AROUND PENETRANTS AND PIPE INSULATION AND SECURED IN PLACE WITH THE TOP SURFACE OF THE FLOOR OR SLAB AND RECESSED WITHIN THE OPENING NOT MORE THAN 2 IN. ABOVE THE BOTTOM OF THE FLOOR. WRAP STRIP REQUIRED AROUND INSULATED PENETRANTS WHICH MAY BE TIGHTLY BUNDLED TOGETHER. WRAP STRIP ALSO REQUIRED TO BE INSTALLED AROUND INSULATED PENETRANTS WHEN INSTALLED LESS THAN 1/2 IN. FROM UNSULATED TUBES OR CABLES. IN SUCH CASES WHERE INSULATED PENETRANT IS AT POINT CONTACT WITH UNSULATED TUBES OR CABLES, WRAP STRIP TO BE WEDGED BETWEEN INSULATION AND UNSULATED TUBE OR CABLE BY COMPRESSING INSULATION. WRAP STRIP NOT REQUIRED AROUND INSULATED TUBES INSTALLED 1/2 IN. OR GREATER FROM OTHER PENETRANTS.
    - 3M COMPANY - ULTRA GS

3M COMPANY - ULTRA GS  
 \*BEARING THE UL CLASSIFICATION MARK

**04 FLOOR / WALL JOINT DETAIL SCALE: N.T.S.**

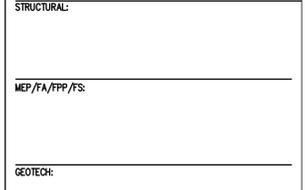


SYSTEM NO. HW-D-0169  
 ASSESSMENT RATING - 2 HR  
 NOMINAL JOINT WIDTH - 3/4 IN  
 CLASS II MOVEMENT CAPABILITIES - 16.6%  
 COMPRESSION OR EXTENSION  
 NOTE:  
 FIRE STOPPING DETAILS  
 BASED ON 3M PRODUCTS-OR  
 EQUALS ACCEPTABLE

- FLOOR ASSEMBLY - MIN 4-1/2 IN. THICK LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE.
- WALL ASSEMBLY - MIN 7-1/2 IN. THICK UL CLASSIFIED CONCRETE BLOCKS\* OR MIN 7-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) STRUCTURAL CONCRETE.
  - SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.
- JOINT SYSTEM - MAX SEPARATION BETWEEN TOP OF FLOOR AND TOP OF WALL IS 3/4 IN. THE JOINT SYSTEM IS DESIGNED TO ACCOMMODATE A MAX 16.6% COMPRESSION OR EXTENSION FROM ITS INSTALLED WIDTH. MAX WIDTH OF JOINT 3/4 IN. THE JOINT SYSTEM CONSIST OF THE FOLLOWING:
  - PACKING MATERIAL - NOM 1 IN. DIAM POLYETHYLENE BACKER ROD COMPRESSED AND INSTALLED INTO JOINT. PACKING MATERIAL TO BE RECESSED FROM EACH SURFACE OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.
  - FILL, VOID OR CAVITY MATERIAL\* - CAULK - MIN 1/2 IN. THICKNESS OF FILL MATERIAL INSTALLED WITHIN JOINTS ON EACH SIDE OF THE WALL FLUSH WITH EACH SURFACE OF THE WALL. MINNESOTA MINING & MFG CO. - FD-150 +  
 \*BEARING THE UL CLASSIFICATION MARK

3M COMPANY - FIRE BARRIER PACKING MATERIAL

**CONSULTANTS:**



STRUCTURAL:  
 MEP/FA/FFP/FS:  
 GEOTECH:

06-24-15	AS PER DOB OBJECTIONS
----------	-----------------------

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ELEVATOR SPECIFICATION

P.E. #1  
 PRODUCT NAME:  
 KONE ECOSPACE ELEVATOR  
 SEISMIC  
 CAPACITY: 2500 LBS (1134 KG)  
 SPEED: 150 FPM  
 DOOR: RIGHT OPENINGS  
 TRAVEL: 52'-6"  
 CONTROL LOCATION: REMOTE CLOSET  
 POWER SUPPLY: 208  
 REQUIRED FUSE AMPS: 35  
 CONTROLLER HEAT OUTPUT: 2.4 KBTU/HR  
 MACHINE HEAT OUTPUT: 1.2 KBTU/HR

P.E. #1 STRUCTURAL REFERENCES

BRKTS ABOVE TOPMOST LANDING - IMPACT LOADING REACTIONS (Ibf)

REACTION LOCATION	A	B	C
X DIRECTION	980	200	60
Y DIRECTION	430	1130	110

BRKTS BELOW TOPMOST LANDING - RUNNING REACTIONS (Ibf)

REACTION LOCATION	A	B	C
X DIRECTION	250	200	60
Y DIRECTION	170	70	110

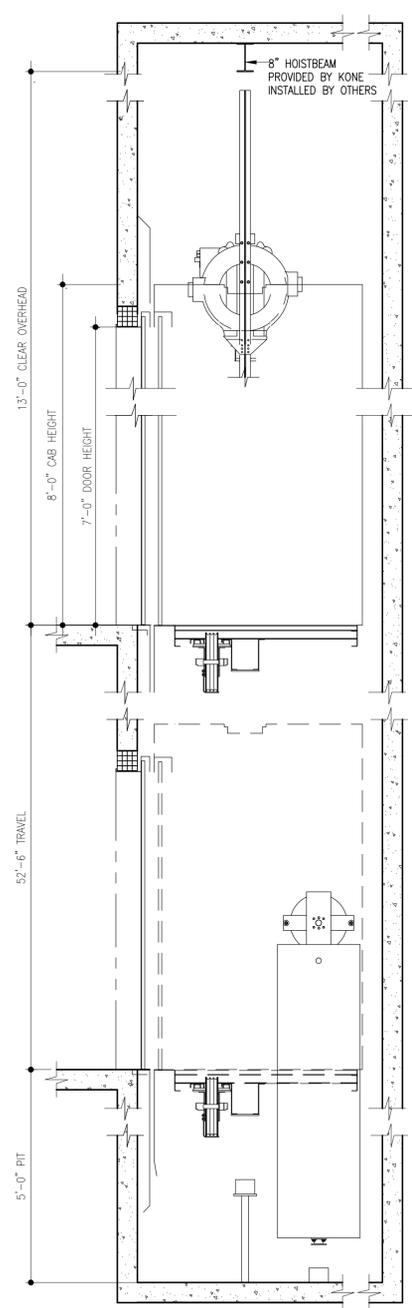
VERTICAL FORCES ONTO PIT FLOOR (Ibf)

REACTION LOCATION	A	B	C	D	E
Z DIRECTION	16000	8300	4400	10400	15900

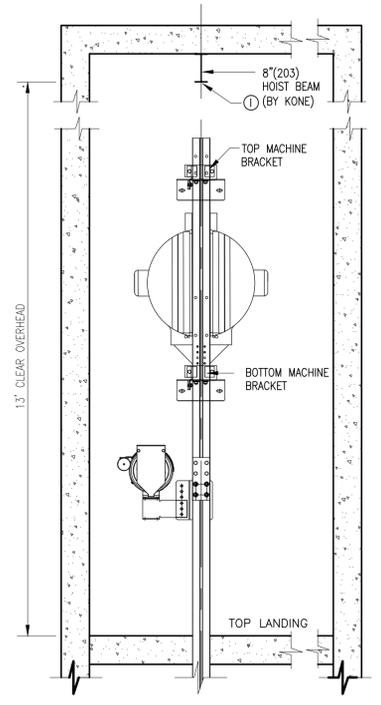
\*\*VERTICAL REACTIONS A, B & C OCCUR SIMULTANEOUSLY. VERTICAL REACTIONS D & E OCCUR INDIVIDUALLY AND SEPARATELY FROM A, B & C.

HOISTBEAM & LIFE LINE VERTICAL FORCES (Ibf)

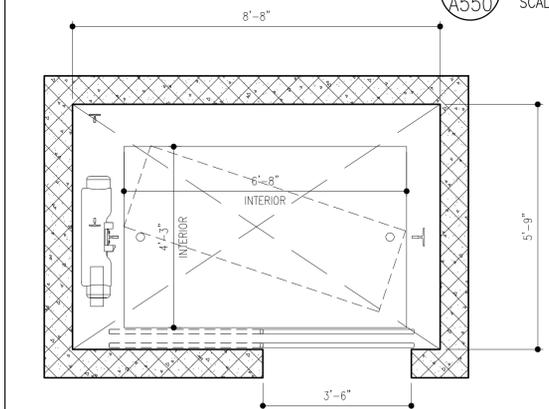
REACTION LOCATION	A	B	C	D
Z DIRECTION	4800	4700	5000	5000



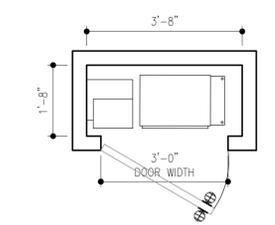
S1  
A550  
PIT SECTION  
SCALE: 1/2"=1'-0"



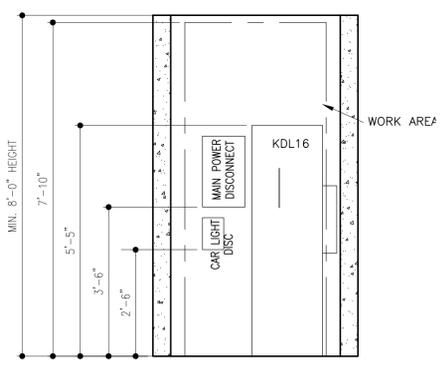
S2  
A550  
HOISTWAY SECTION  
SCALE: 1/2"=1'-0"



P1  
A550  
HOISTWAY PLAN  
SCALE: 1/2"=1'-0"



P2  
A550  
CONTROL CLOSET PLAN  
SCALE: 1/2"=1'-0"



E1  
A550  
CONTROL CLO. ELEVATION  
SCALE: 1/2"=1'-0"

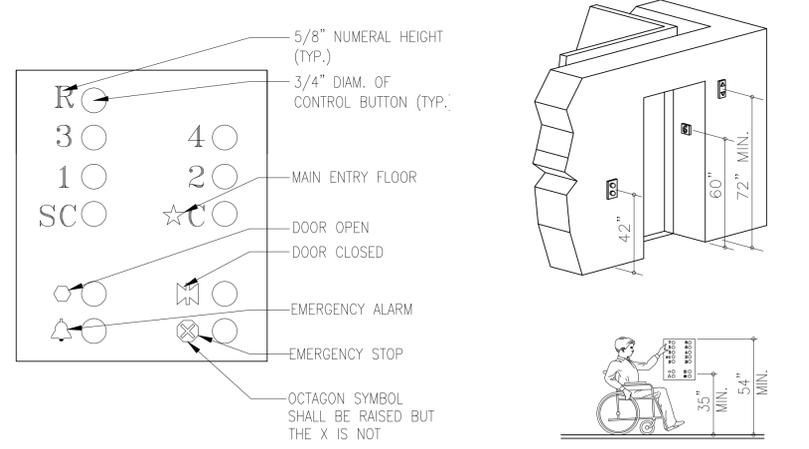
ELEVATOR NOTES

1. PROVIDE A CLEAR, PLUMB HOISTWAY OF THE SIZE SHOWN ON THE FINAL KONE LAYOUT. VARIATIONS MUST NOT EXCEED 2". (TOLERANCE = -0" + 2")
2. PROVIDE ADEQUATE SUPPORT FOR GUIDE RAIL BRACKETS (INCLUDING DIVIDER BEAMS FOR MULTIPLE ELEVATORS IN A COMMON HOISTWAY) FROM PIT FLOOR TO THE TOP OF THE HOISTWAY AND NOT SPANNING FURTHER THAN ALLOWED BY THE GOVERNING CODE AUTHORITY. FIREPROOFING SHALL BE AFTER INSTALLATION OF BRACKETS.
3. HOISTWAY VENTILATION SHALL BE PROVIDED PER CODE REQUIREMENTS PROJECTIONS REQUIRING BEVELING IN ACCORDANCE WITH CODE REQUIREMENTS SHALL BE BEVELED AT AN ANGLE NOT LESS THAN 75 DEGREES FROM THE HORIZONTAL.
5. PROVIDE REMOVABLE, OSHA COMPLIANT BARRICADES AROUND ALL HOISTWAY OPENINGS AND BETWEEN ELEVATORS INSIDE OF THE HOISTWAY AS REQUIRED. PROVIDE TWO LIFELINE ATTACHMENTS AT THE TOP, FRONT OF THE HOISTWAY.
6. ARRANGE FOR ALL BLOCK OUT / CUTOUT OF OPENINGS TO INSTALL HALL PUSHBUTTONS, SIGNAL FIXTURES, AND HATCH DUCT.
7. PROVIDE A DRY PIT REINFORCED TO SUSTAIN VERTICAL FORCE FROM RAILS AND BUFFERS. REFERENCE THE REACTION LOAD TABLES FOR VERTICAL FORCES. SUMPS AND / OR PUMPS (WHERE PERMITTED) LOCATED WITHIN THE PIT MAY NOT INTERFERE WITH THE ELEVATOR EQUIPMENT.
8. PROVIDE SUITABLE LIGHTING FOR THE MACHINE SPACE WITH A LIGHT SWITCH LOCATED IN THE HOISTWAY. PROVIDE A LIGHT FIXTURE WITH AND A SEPARATE GFCI PROTECTED DUPLEX CONVENIENCE OUTLET IN THE ELEVATOR PIT.
9. ENTRANCE WALLS ARE TO BE LEFT OPEN UNTIL THE ELEVATOR EQUIPMENT IS INSTALLED. ADEQUATE SUPPORT FOR ENTRANCE ATTACHMENT POINTS IS REQUIRED ALL LANDINGS, ALL FINISHED FLOORING AND GROUTING IS TO BE INSTALLED AFTER THE ENTRANCE FRAMES ARE INSTALLED.
10. I-BEAMS, PROVIDED BY KONE, MUST BE INSTALLED IN THE ELEVATOR HOISTWAY OVERHEAD PER THE KONE FINAL LAYOUT DRAWINGS.
11. PROVIDE A PIT LADDER OF NON-COMBUSTIBLE MATERIAL EXTENDING FROM PIT FLOOR TO 48" ABOVE SILL OF ACCESS LANDING. LOCATE AND INSTALL PER KONE FINAL SLEEVES, OR PENETRATIONS, LOCATED PER MACHINE ROOM PLAN VIEW ON KONE FINAL LAYOUT DRAWINGS.
12. FOR PROPER EQUIPMENT OPERATION; THE MACHINE SPACE AT THE TOP OF THE HOISTWAY MUST BE PROPERLY VENTED PER CODE REQUIREMENTS. MAX ALLOWED HUMIDITY IS 95% NON-CONDENSING. HOISTWAY MUST MAINTAIN A TEMPERATURE BETWEEN 41 F AND 104 F.
13. THE ACCESS DOOR TO THE CONTROL SPACE OR THE CONTROL ROOM MUST BE SECURED AGAINST UNAUTHORIZED ACCESS. IT SHALL BE SELF LOCKING AND SELF CLOSING.
14. PROVIDE A 15-AMP 102V AC FUSED SERVICE WITH GROUND (VIA EMERGENCY LIGHT SUPPLY IF AVAILABLE) CONNECTED TO EACH CONTROL CABINET FOR LIGHTING AND FAN. PROVIDE DEDICATED PHONE LINE TERMINATING AT THE ELEVATOR CONTROL CABINET.
15. FOR CONTROL SPACES LOCATED REMOTELY FROM THE ELEVATOR HOISTWAY, PROVIDE A GOVERNOR ACCESS DOOR OF SIZE AND LOCATION PER KONE FINAL LAYOUT DRAWINGS. THE ACCESS DOOR SHALL BE SECURED AGAINST UNAUTHORIZED ACCESS.
16. PROVIDE A SUITABLE WORKING ENVIRONMENT INCLUDING ADEQUATE ACCESS TO THE BUILDING, PROPER LIGHTING IN ALL AREAS, CLEAN AND SAFE STORAGE ADJACENT TO THE HOISTWAY, AND SUFFICIENT ON-SITE REFUSE CONTAINERS FOR THE DISPOSAL OF ELEVATOR PACKING MATERIALS.
17. THIS DRAWING MUST BE REVIEWED AND APPROVED BY A LICENCED PROFESSIONAL TO ENSURE COMPLIANCE WITH LOCAL BUILDING CODES.
18. THESE DRAWINGS ARE FOR INFORMATION PURPOSES ONLY AND MUST NOT BE USED FOR CONSTRUCTION PURPOSES. FULLY DETAILED CONSTRUCTION DRAWINGS ARE AVAILABLE FROM THE PRODUCT MANUFACTURER.

NOTES:

- A) ELEVATOR SHAFT DIMENSIONS ARE SHOWN AS PER SELECTED MANUFACTURER'S RECOMMENDATIONS.
- B) GC TO VERIFY WITH ELEVATOR MANUFACTURER FOR THE SIZE OF REQUIRED SHAFT, OPENINGS, REQUIRED CLEARANCES, PIT DEPTH, BULKHEAD HEIGHT AND VENTING PRIOR TO COMMENCEMENT OF ANY WORK ON THE SHAFT WALL OR ITS STRUCTURE
- C) GC TO PROVIDE SHOP DRAWINGS FOR ARCHITECT'S REVIEW AND APPROVAL CLEARLY SHOWING THE REQUIRED ROUGH OPENING PRIOR TO BUILDING OF THE SHAFT WALL AND STEEL STRUCTURE SUPPORTING SUCH SHAFT

DETAILS



D1  
A520  
ELEVATOR CONTROL PANEL  
SCALE: 1/2"=1'-0"

D2  
A520  
MOUNTING HEIGHTS  
SCALE: 1/4"=1'-0"

CONSULTANTS:

NO.	DATE	DESCRIPTION OF REVISION
06-24-15		AS PER DOB OBJECTIONS

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 M.S. SAVANI ARCHITECT, PC

**Mss**  
**M.S. SAVANI ARCHITECT, PC**

148-45, HILLSIDE AVENUE  
 SUITE 201  
 JAMAICA, NY 11435  
 TEL: 718.657.6222  
 FAX: 718.657.6226  
 mss@mssarch.com

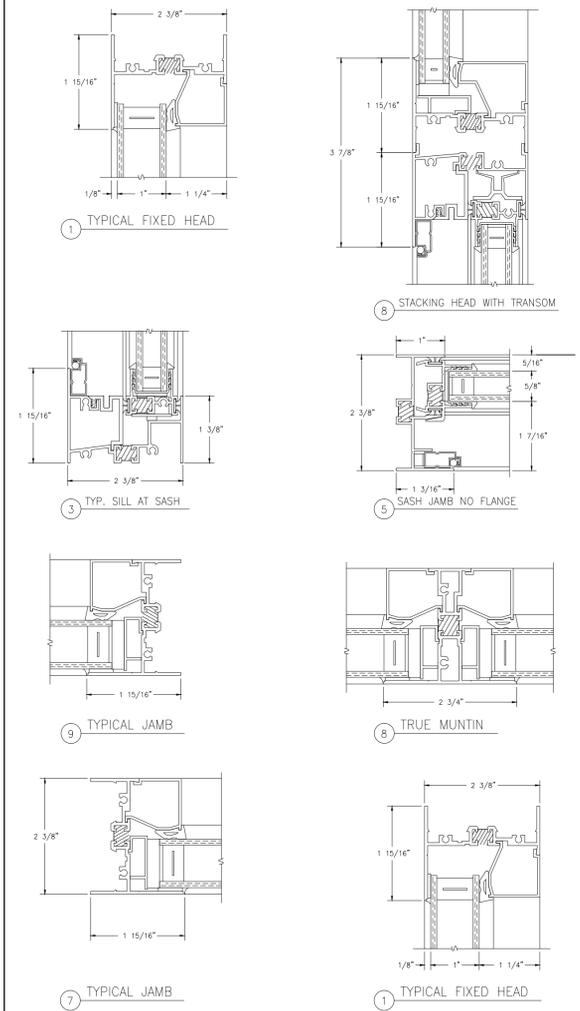
CLIENT:  
 SHIV SHAKTI PEETH  
 (HINDU TEMPLE)

DOB STAMP & SIGNATURE:

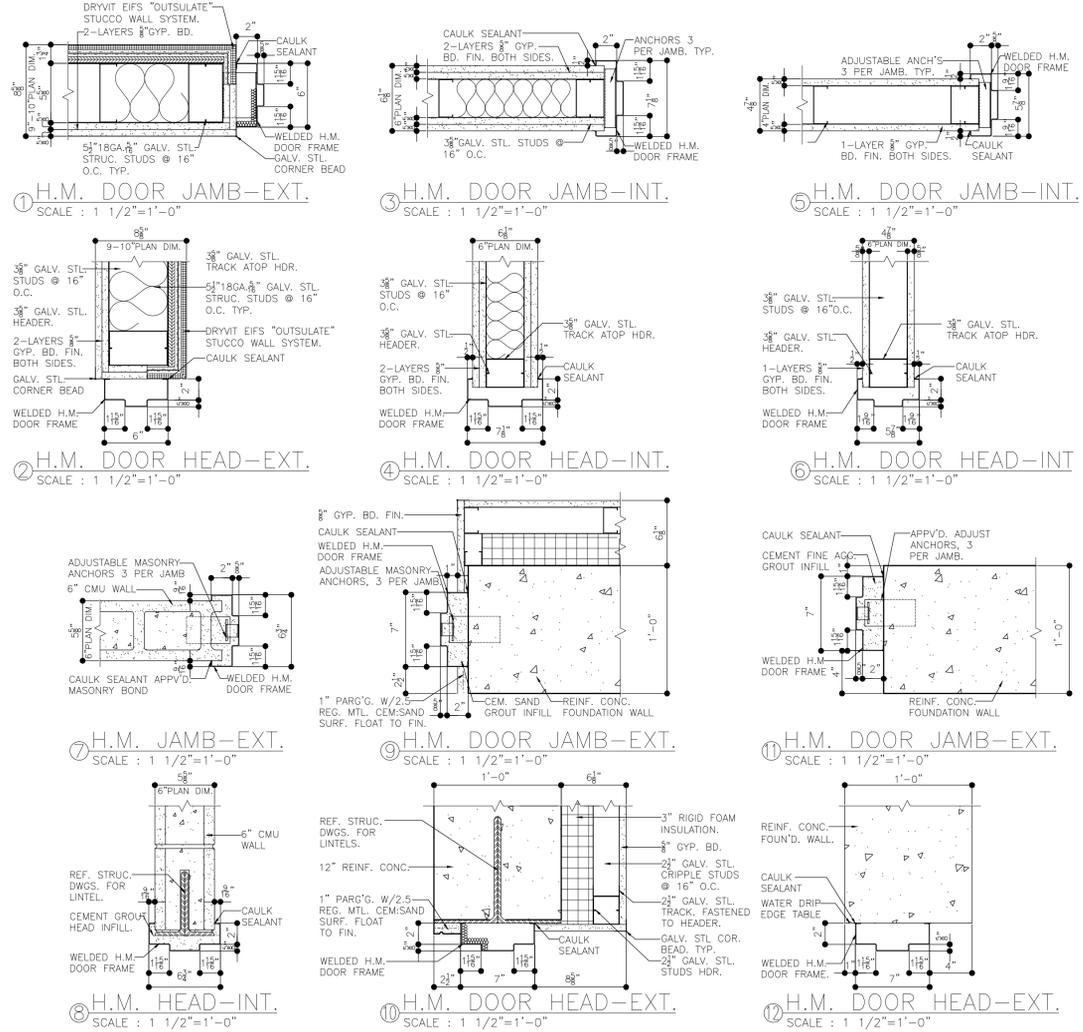
PROJECT:  
 PROPOSED 2-STY AND CELLAR TEMPLE W/  
 CARETAKER'S APARTMENT AND RECTORY  
 264-16 HILLSIDE AVENUE,  
 GLEN OAKS, NY 11004

TITLE:  
 ELEVATOR DETAILS AND  
 NOTES

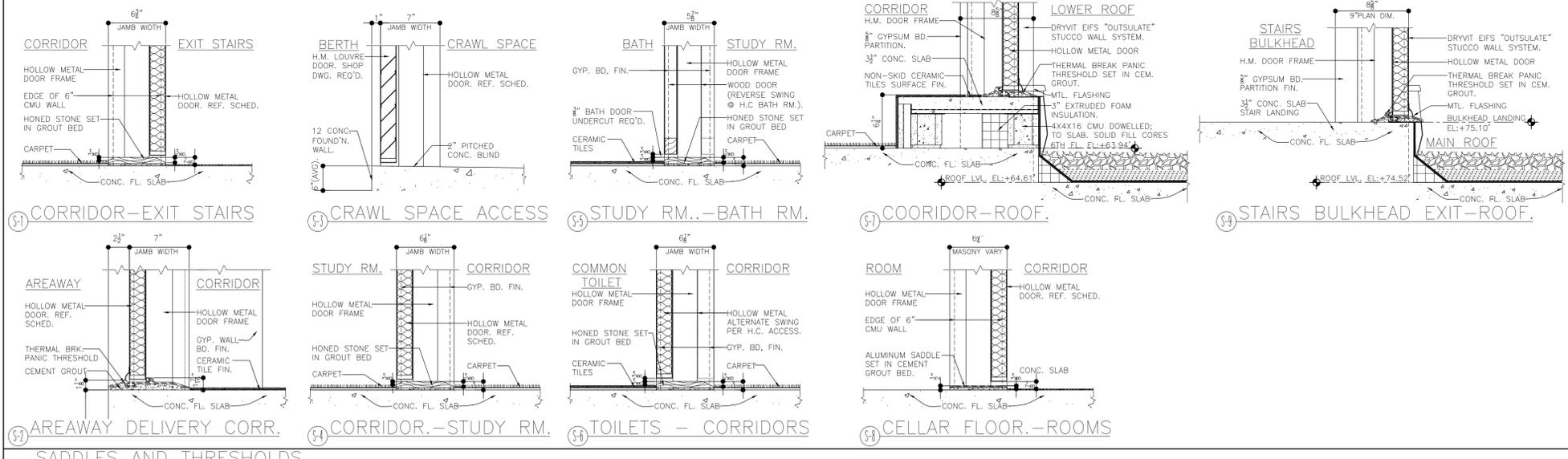
SEAL & SIGNATURE:  
 DATE: 10.16.14  
 PROJECT NO.: MSS-630  
 DRAWING BY: AC  
 CHK. BY: MSS  
 DWG. NO.:  
**A-508.00**  
 CAD FILE NO: 29 OF 37  
 Z: 1-MSS



TYPICAL WINDOW SILL & JAMB DETAILS



DOOR HEAD AND JAMBS DETAILS



DOOR DETAILS

CONSULTANTS:

STRUCTURAL:

MEP/FA/PPP/FS:

GEOTECH:

06-24-15 AS PER DOB OBJECTIONS

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**Mss**  
**M.S. SAVANI ARCHITECT, PC**

148-45, HILLSIDE AVENUE  
 SUITE 201  
 JAMAICA, NY 11435  
 TEL: 718.657.6222  
 FAX: 718.657.6226  
 mss@mssarch.com

CLIENT:  
 SHIV SHAKTI PEETH  
 (HINDU TEMPLE)

DOB STAMP & SIGNATURE:

PROJECT:  
 PROPOSED 2-STY AND CELLAR TEMPLE W/  
 CARETAKER'S APARTMENT AND RECTORY  
 264-16 HILLSIDE AVENUE,  
 GLEN OAKS, NY 11004

TITLE:  
 DOOR DETAILS

SEAL & SIGNATURE: DATE: 10.16.14  
 PROJECT NO.: MSS-630  
 DRAWING BY: AC  
 CHK. BY: MSS  
 DWG NO.:  
**A-600.00**  
 CAD FILE NO: 30 OF 37  
 Z: 1-MSS



**APPENDIX 2**  
**CITIZEN PARTICIPATION PLAN**

## APPENDIX 2

### CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Shiv Shakti Peeth have established this Citizen Participation Plan because the opportunity for citizen participation is an important component of the NYC Voluntary Cleanup Program. This Citizen Participation Plan describes how information about the project will be disseminated to the Community during the remedial process. As part of its obligations under the NYC VCP, Shiv Shakti Peeth will maintain a repository for project documents and provide public notice at specified times throughout the remedial program. This Plan also takes into account potential environmental justice concerns in the community that surrounds the project Site. Under this Citizen Participation Plan, project documents and work plans are made available to the public in a timely manner. Public comment on work plans is strongly encouraged during public comment periods. Work plans are not approved by the NYC Office of Environmental Remediation (OER) until public comment periods have expired and all comments are formally reviewed. An explanation of cleanup plans in the form of a public meeting or informational session is available upon request to OER's project manager assigned to this Site, Noel Anderson, who can be contacted about these issues or any others questions, comments or concerns that arise during the remedial process at (212) 788-8841.

**Project Contact List:** OER has established a Site Contact List for this project to provide public notices in the form of fact sheets to interested members of the Community.

Communications will include updates on important information relating to the progress of the cleanup program at the Site as well as to request public comments on the cleanup plan. The Project Contact List includes owners and occupants of adjacent buildings and homes, principal administrators of nearby schools, hospitals and day care centers, the public water supplier that serves the area, established document repositories, the representative Community Board, City Council members, other elected representatives and any local Brownfield Opportunity Area (BOA) grantee organizations. Any member of the public or organization will be added to the

Site Contact List on request. A copy of the Site Contact List is maintained by OER's project manager. If you would like to be added to the Project Contact List, contact NYC OER at (212) 788-8841 or by email at [brownfields@cityhall.nyc.gov](mailto:brownfields@cityhall.nyc.gov).

**Repositories:** A document repository is maintained online. Internet access to view OER's document repositories is available at public libraries. This document repository is intended to house, for community review, all principal documents generated during the cleanup program including Remedial Investigation plans and reports, Remedial Action work plans and reports, and all public notices and fact sheets produced during the lifetime of the remedial project. The library nearest the Site is:

Queens Library; Glen Oaks

256-04 Union Turnpike Glen Oaks, NY (718) 831-8636

Mon 12:00 PM - 8:00 PM

Tue 1:00 PM - 6:00 PM

Wed 10:00 AM - 6:00 PM

Thu 12:00 PM - 8:00 PM

Fri 10:00 AM - 6:00 PM

Sat 10:00 AM - 5:00 PM

Sun **Closed**

**Digital Documentation:** NYC OER requires the use of digital documents in our repository as a means of minimizing paper use while also increasing convenience in access and ease of use.

**Issues of Public Concern:** The major issues of concern to the public will be potential impacts of nuisance odors and dust during the disturbance of historic fill soils at the Site. This work will be performed in accordance with procedures which will be specified under a detailed Remedial Program which considers and takes preventive measures for exposures to future residents of the property and those on adjacent properties during construction. Detailed plans to monitor the potential for exposure including a Construction Health and Safety Plan and a

Community Air Monitoring Plan are required components of the remedial program.

Implementation of these plans will be under the direct oversight of the New York City Office of Environmental Remediation (NYCOER). These plans will specify the following worker and community health and safety activities during remedial activity at the Site:

- On-Site air monitoring for worker protection,
- Perimeter air monitoring for community protection.

The Health and Safety Plan and the Community Air Monitoring Plan prepared as part of the Remedial Action Work Plan will be available for public review at the document repository.

**Public Notice and Public Comment:** Public notice to all members of the Project Contact List is required at three major steps during the performance of the cleanup program (listed below) and at other points that may be required by OER. Notices will include Fact Sheets with descriptive project summaries, updates on recent and upcoming project activities, repository information, and important phone and email contact information. All notices will be reviewed and approved by OER prior to distribution and mailed by the Enrollee. Public comment is solicited in public notices for all work plans developed under the NYC Voluntary Cleanup Program. Final review of all work plans by OER will consider all public comments. Approval will not be granted until the public comment period has been completed.

**Citizen Participation Milestones:** Public notice and public comment activities occur at several steps during a typical NYC VCP project. These steps include:

- **Public Notice of the availability of the Remedial Investigation Report and Remedial Action Work Plan and a 30-day public comment period on the Remedial Action Work Plan:** Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the availability of the Remedial Investigation Report and Remedial Action Work Plan and the initiation of a 30-day public comment period on the Remedial Action Work Plan. The Fact Sheet summarizes the findings of the RIR and provides details of the RAWP. The public comment period will be extended an additional 15 days upon public request. A public meeting or informational session will be conducted by OER upon request.

- **Public Notice announcing the approval of the RAWP and the start of remediation:**  
Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the approval of the RAWP and the start of remediation.
- **Public Notice announcing the completion of remediation, designation of Institutional and Engineering Controls and issuance of the Notice of Completion:**  
Public notice in the form of a Fact Sheet is sent to all parties listed on the Site Contact List announcing the completion of remediation, providing a list of all Institutional and Engineering Controls implemented for to the Site and announcing the issuance of the Notice of Completion.

**APPENDIX 3**  
**SUSTAINABILITY STATEMENT**

## APPENDIX 3

### SUSTAINABILITY STATEMENT

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

#### **Reuse of Clean, Recyclable Materials and Reduced Consumption of Non-**

**Renewable Resources:** Reuse of clean, locally-derived recyclable materials reduces consumption of non-renewable virgin resources and can provide energy savings and greenhouse gas reduction.

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

#### **Reduced Energy Consumption and Promotion of Greater Energy Efficiency:**

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

Best efforts will be made to quantify energy efficiencies achieved during the remediation and will be reported in the Remedial Action Report (RAR). Where energy savings cannot be easily quantified, a gross indicator of the amount of energy saved or the means by which energy savings was achieved will be reported.

**Conversion to Clean Fuels:** Use of clean fuel improves NYC's air quality by reducing harmful emissions.

Natural gas will be utilized for fuel in the new building.

An estimate of the volume of clean fuels used during remedial activities will be quantified and reported in the RAR.

**Recontamination Control:** Recontamination after cleanup and redevelopment is completed undermines the value of work performed, may result in a property that is less protective of public health or the environment, and may necessitate additional cleanup work later or impede future redevelopment. Recontamination can arise from future releases that occur within the property or by influx of contamination from off-Site. An estimate of the area of the Site that utilizes recontamination controls under this plan will be reported in the RAR in square feet.

**Stormwater Retention:** Stormwater retention improves water quality by lowering the rate of combined stormwater and sewer discharges to NYC's sewage treatment plants during periods of precipitation, and reduces the volume of untreated influent to local surface waters. An estimate of the enhanced stormwater retention capability of the redevelopment project will be included in the RAR.

**Linkage with Green Building:** Green buildings provide a multitude of benefits to the city across a broad range of areas, such as reduction of energy consumption, conservation of resources, and reduction in toxic materials use.

The number of Green Buildings that are associated with this brownfield redevelopment property will be reported in the RAR. The total square footage of green building space created as a function of this brownfield redevelopment will be quantified for residential, commercial and industrial/manufacturing uses.

**Paperless Voluntary Cleanup Program:** Shiv Shakti Peeth is participating in OER's Paperless Voluntary Cleanup Program. Under this program, submission of electronic documents will replace submission of hard copies for the review of project documents, communications and milestone reports.

**Low-Energy Project Management Program:** Shiv Shakti Peeth is participating in OER's low-energy project management program. Under this program, whenever possible,

meetings are held using remote communication technologies, such as videoconferencing and teleconferencing to reduce energy consumption and traffic congestion associated with personal transportation.

**Trees and Plantings:** Trees and other plantings provide habitat and add to NYC's environmental quality in a wide variety of ways. Native plant species and native habitat provide optimal support to local fauna, promote local biodiversity, and require less maintenance.

An estimate of the land area that will be vegetated, including the number of trees planted or preserved, will be reported in square feet in the RAR.

**APPENDIX 4**  
**SOIL / MATERIALS**  
**MANAGEMENT PLAN**

## **APPENDIX 4**

### **SOIL/MATERIALS MANAGEMENT PLAN**

#### **1.1 Soil Screening Methods**

Visual, olfactory and PID soil screening and assessment will be performed under the supervision of a Qualified Environmental Professional and will be reported in the final remedial report. Soil screening will be performed during invasive work performed during the remedy and development phases prior to issuance of final signoff by OER.

#### **1.2 Stockpile Methods**

Excavated soil from suspected areas of contamination (e.g., hot spots, USTs, drains, etc.) will be stockpiled separately and will be segregated from clean soil and construction materials.

Stockpiles will be used only when necessary and will be removed as soon as practicable. While stockpiles are in place, they will be inspected daily, and before and after every storm event.

Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. Excavated soils will be stockpiled on, at minimum, double layers of 8-mil minimum sheeting, will be kept covered at all times with appropriately anchored plastic tarps, and will be routinely inspected. Broken or ripped tarps will be promptly replaced.

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

#### **1.3 Characterization of Excavated Materials**

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

## **1.4 Materials Excavation, Load-Out, and Departure**

The PE/QEP overseeing the remedial action will:

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

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

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

## **1.5 Off-Site Materials Transport**

Loaded vehicles leaving the Site will comply with all applicable materials transportation requirements (including appropriate covering, manifests, and placards) in accordance with applicable laws and regulations, including use of licensed haulers in accordance with 6 NYCRR Part 364. If loads contain wet material capable of causing leakage from trucks, truck liners will be used. Queuing of trucks will be performed on-Site, when possible in order to minimize off Site disturbance. Off-Site queuing will be minimized.

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

## **1.6 Materials Disposal Off-Site**

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

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

All impacted soil/fill or other waste excavated and removed from the Site will be managed as regulated material and will be disposed in accordance with applicable laws and regulations. Historic fill and contaminated soils taken off-Site will be handled as solid waste and will not be disposed at a Part 360-16 Registration Facility (also known as a Soil Recycling Facility). Waste characterization will be performed for off-Site disposal in a manner required by the receiving facility and in conformance with its applicable permits. Waste characterization

sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the final remedial report. A manifest system for off-Site transportation of exported materials will be employed. Manifest information will be reported in the final remedial report. Hazardous wastes derived from on-Site will be stored, transported, and disposed of in compliance with applicable laws and regulations.

If disposal of soil/fill from this Site is proposed for unregulated disposal (i.e., clean soil removed for development purposes), including transport to a Part 360-16 Registration Facility, a formal request will be made for approval by OER with an associated plan compliant with 6NYCRR Part 360-16. This request and plan will include the location, volume and a description of the material to be recycled, including verification that the material is not impacted by site uses and that the material complies with receipt requirements for recycling under 6NYCRR Part 360. This material will be appropriately handled on-Site to prevent mixing with impacted material.

## **1.7 Materials Reuse On-Site**

Soil and fill that is derived from the property that meets the Soil Cleanup Objectives (SCOs) established in this plan may be reused on-Site. The SCOs for on-Site reuse are listed in Section 4.2 of this cleanup plan. 'Reuse on-Site' means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on land with comparable levels of contaminants in soil/fill material, compliant with applicable laws and regulations, and addressed pursuant to the NYC VCP agreement subject to Engineering and Institutional Controls. The PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this remedial plan are followed. The expected location for placement of reused material is shown in Section 4.2.

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

## **1.8 Demarcation**

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

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

## **1.9 Import of Backfill Soil From Off-Site Sources**

This Section presents the requirements for imported fill materials to be used below the cover layer and within the clean soil cover layer. All imported soils will meet OER-approved backfill and cover soil quality objectives for this Site. The backfill and cover soil quality objectives are listed in Section 4.2. Imported soils will not exceed groundwater protection standards established in Part 375. Imported soils for Track 1 remedial action projects will not exceed Track 1 SCO's. A process will be established to evaluate sources of backfill and cover soil to be imported to the Site, and will include an examination of source location, current and historical use(s), and any applicable documentation. Material from industrial sites, spill sites, environmental remediation sites or other potentially contaminated sites will not be imported to the Site.

The following potential sources may be used pending attainment of backfill and cover soil quality objectives:

- Clean soil from construction projects at non-industrial sites in compliance with applicable laws and regulations;
- Clean soil from roadway or other transportation-related projects in compliance with applicable laws and regulations;
- Clean recycled concrete aggregate (RCA) from facilities permitted or registered by the regulations of NYS DEC.
- All materials received for import to the Site will be approved by a PE/QEP and will be in compliance with provisions in this remedial plan. The final remedial report will report the source of the fill, evidence that an inspection was performed on the source, chemical sampling results, frequency of testing, and a Site map indicating the locations where backfill or soil cover was placed.
- All material will be subject to source screening and chemical testing.
- Inspection of imported fill material will include visual, olfactory and PID screening for evidence of contamination. Materials imported to the Site will be subject to inspection, as follows:
  - Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;
  - The PE/QEP is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and
  - Fill material will be free of solid waste including pavement materials, debris, stumps, roots, and other organic matter, as well as ashes, oil, perishables or foreign matter.

Composite samples of imported material will be taken at a minimum frequency of one sample for every 500 cubic yards of material. Once it is determined that the fill material meets imported backfill or cover soil chemical requirements and is non-hazardous, and lacks petroleum contamination, the material will be loaded onto trucks for delivery to the Site.

Recycled concrete aggregate (RCA) will be imported from facilities permitted or registered by NYSDEC. Facilities will be identified in the final remedial report. A PE/QEP is responsible to ensure that the facility is compliant with 6NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA. RCA imported from compliant facilities will

not require additional testing, unless required by NYSDEC under its terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete. RCA material is not acceptable for, and will not be used as cover material.

### **1.10 Fluids Management**

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable laws and regulations. Liquids discharged into the New York City sewer system will receive prior approval by New York City Department of Environmental Protection (NYC DEP). The NYC DEP regulates discharges to the New York City sewers under Title 15, Rules of the City of New York Chapter 19. Discharge to the New York City sewer system will require an authorization and sampling data demonstrating that the groundwater meets the City's discharge criteria. The dewatering fluid will be pretreated as necessary to meet the NYC DEP discharge criteria. If discharge to the City sewer system is not appropriate, the dewatering fluids will be managed by transportation and disposal at an off-Site treatment facility.

Discharge of water generated during remedial construction to surface waters (i.e. a stream or river) is prohibited without a SPDES permit issued by New York State Department of Environmental Conservation.

### **1.11 Stormwater Pollution Prevention**

Applicable laws and regulations pertaining to stormwater pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in this remedial plan (silt fences and barriers, and hay bale checks) will be installed around the entire perimeter of the remedial construction area and inspected once a week and after every storm event to ensure that they are operating appropriately. Discharge locations will be inspected to determine whether erosion control measures are effective in preventing significant impacts to receptors.

Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. All necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. Undercutting or

erosion of the silt fence toe anchor will be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

### **1.12 Contingency Plan for Unknown Contamination Sources**

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

### **1.13 Odor, Dust, and Nuisance Control**

#### **Odor Control**

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

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

## **Dust Control**

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

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

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

## **Other Nuisances**

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

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

**APPENDIX 5**  
**CONSTRUCTION HEALTH AND**  
**SAFETY PLAN**

**264-12 HILLSIDE AVENUE**  
**QUEENS, NEW YORK**  
**Block 8794 Lot 22**

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**CONSTRUCTION**  
**HEALTH AND SAFETY PLAN**

FEBRUARY 2016

*Prepared By:*

***EBC***

**ENVIRONMENTAL BUSINESS**

1808 Middle Country Road  
Ridge, NY 11961

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## STATEMENT OF COMMITMENT

This Construction Health and Safety Plan (CHASP) has been prepared to ensure that workers are not exposed to risks from hazardous materials during the Remedial Action at 264-12 Hillside Avenue, Queens, NY.

This CHASP, 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 CHASP 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.

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## 1.0 INTRODUCTION AND SITE ENTRY REQUIREMENTS

This document describes the health and safety guidelines developed by Environmental Business Consultants (EBC) for the planned Remedial Action at 264-12 Hillside Avenue, Queens, NY to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous materials or wastes during remedial activities. In accordance with the Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.120 Hazardous Waste Operations and Emergency Response Final rule, this CHASP, including the attachments, addresses safety and health hazards related to excavation, loading and other soil disturbance activities and is based on the best information available. The CHASP may be revised by EBC at the request of the developer 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 Medical Monitoring Requirements

Field personnel and visitors entering the exclusion zone or decontamination zone must have completed appropriate medical monitoring required under OSHA 29 CFR 1910.120(f) if respirators or other breathing related PPE is needed. Medical monitoring enables a physician to monitor each employee's health, physical condition, and his fitness to wear respiratory protective equipment and carry out on-site tasks.

## 1.3 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 CHASP. Amendments to the HASP are acknowledged by completing forms included in **Appendix B**.

## 1.4 Key Personnel - Roles and Responsibilities

Personnel responsible for implementing this Health and Safety Plan are:

Name	Title	Address	Contact Numbers
Mrs. Chawinie Reilly	EBC Project Manager	1808 Middle Country Rd Ridge, NY 11961	(631) 504-6000
Mr. Kevin Waters	Site Safety Officer	1808 Middle Country Rd Ridge, NY 11961	(631) 504-6000

The project manager is responsible for overall project administration and, with guidance from the site safety officer, for supervising the implementation of this CHASP. 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 CHASP 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 CHASP.
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

The Site is located at 264-12 Hillside Avenue in the Hillside Section of the Borough of Queens, New York, and is currently identified as Block 8794 and Lot 22 on the New York City Tax Map. Figure 1 shows the Site location. The lot is square shaped and approximately 10,000 square feet (sf) in total with 100 feet of street frontage along Hillside Avenue and 100 feet of street frontage on 265<sup>th</sup> Street. A map of the site boundary is shown on Figure 2. Currently, Lot 22 is vacant.

### 2.1 Previous Investigations

#### 2.1.1 Gasoline Tank Excavation Report (Phoenix Environmental Technologies, August 2003)

A Gasoline Tanks Excavation Report, prepared by Phoenix Environmental Technologies, Inc. (PET) (dated August 22, 2003) detailed the removal of all twelve gasoline USTs, as well as associated underground piping and pump islands. Upon removal, it was discovered that the USTs were encased in concrete approximately 1 foot thick; poured concrete was located beneath the USTs and surrounded the tank field on three sides (north, south, and east). The west side of the tank field was not equipped with a concrete encasement. During the excavation activities, all USTs and associated piping were observed to be in good condition with not reported holes or signs of damage.

Soils located immediately outside the concrete encasement and beneath the dispenser islands were screened using a Photo Ionization Detector (PID) which recorded readings ranging from 0.0 to 15 parts per million (ppm). According to PET's report, the limits of the excavation of the tank field were 29 feet by 22 feet by 8 feet deep. Groundwater was not encountered during excavation activities. Following excavation and field screening activities, a total of five (5) soil samples were collected for analysis from the following locations: one (1) from the bottom of the tank field excavation (TF-Bottom), one (1) from each of the four (4) sidewalls of the tank field excavation (TF-West, TF-North, TF-East, and TF-South), and one (1) from each of the three (3) former dispenser located outside of the tank field excavation area (D-1, D-2, and D-3). All five (5) soil samples were for volatile organic compounds (VOCs) analysis via EPA Method 8021. Reportedly, only one sample, TF-South, was found to contain VOC contamination. The only compound detected was methyl tertiary butyl ether (MTBE) at a concentration of 19 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ). PET's report indicated that this concentration was below the guidance value set for in the NYS TAGM #4046 of 120  $\mu\text{g}/\text{kg}$ .

#### 2.1.2 Subsurface Investigation (EMS, June 2011)

According to a Subsurface Investigation Report conducted by Environmental Management Inc. (EMS) dated June 14, 2011, a total of eight (8) soil borings were advanced on the subject property. Six (6) of these borings were advanced in the area of the former tank field and dispenser islands and are further discussed below. One (1) soil boring (SB-4) was advanced in the area of the current heating oil UST and the remaining boring (SB-8) in the area of the current waste oil UST. One (1) soil sample from each boring was submitted for laboratory analysis. Soil sample SB-4 (located adjacent to the fuel oil tank) was analyzed for volatile organic compounds (VOCs) and STARTS List semi-volatile organic compounds (SVOCs). Soil sample SB-8 (located adjacent to the waste oil tank) was analyzed for STARS List SVOCs and RCRA Metals.

Laboratory analysis of soil sample SB-4 did not reveal elevated concentrations of VOCs or SVOCs. Analysis of soil sample SB-8 reported an SVOC concentration of benzo(a)pyrene at 0.062 milligrams per kilogram (mg/kg), which was above the New York State Technical and Guidance Memo #4046 (TAGM #4046) Recommended Soil Cleanup Objectives (RSCOs) of 0.061 mg/kg.

Additionally, concentrations of arsenic (7.5mg/kg), chromium (12.0 mg/kg), and mercury (0.41 mg/kg) exceeded their respective RSCOs of 18.9 mg/kg, 10 mg/kg, and 0.1 mg/kg in sample SB-8. Based on the results of their investigation, EMS recommended the removal of the 550-gallon waste oil UST located on the subject property.

### **2.1.3 Limited Phase II Subsurface Investigation (AEI, May 2014)**

In May 2014, a Limited Phase II Subsurface Investigation was conducted, which included a geophysical survey. The purpose of the geophysical survey was to outline the current USTs and provide utility clearance. The geophysical survey was conducted using ground penetrating radar (GPR). The results from the geophysical survey indicated the approximate location of the waste oil UST in front of the western most bay door approximately 4 feet bgs. The heating oil UST was located on the eastern side of the site building approximately 11.5 feet bgs. A total of six (6) soil borings (AEI-B1 through AEI-B6) were advanced on the Site. The borings were advanced using a direct-push drilling method. Each boring was advanced to a depth of 20 feet bgs.

Boring AEI-B1 was advanced adjacent to the north of the waste oil UST and Boring AEI-B2 was advanced to the south of the waste oil UST to assess this UST. Soil samples AEI-B1 and AEI-B2 were collected from approximately 10 feet bgs from the northern and southern sides of the waste oil UST.

Boring AEI-B3 was advanced in front of the eastern most bay door of the site building to assess the automobile repair operations inside the site building. Soil sample AEI-B3 was collected from approximately 10 feet bgs from in front of the eastern most bay door of the site building.

Boring AEI-B4 was advanced to the west of the site building, in the area of an aboveground lift to assess the automobile repair operations conducted in this area of the subject property. Soil sample AEI-B4 was collected from approximately 10 feet bgs the western side of the site building, in the area of an aboveground lift.

Borings AEI-B5 and AEI-B6 were advanced on the southern and northern sides of the heating oil UST to assess this UST. Soil samples AEI-B5 and AEI-B6 were collected from approximately 16 feet bgs on the southern and northern sides of the heating oil UST.

No elevated PID readings were reported, and no odors or staining were observed in any of the soil columns. Acetone was detected in soil samples AEI-B1 (0.0071mg/kg), AEI-B2 (0.007mg/kg), AEI-B3 (0.0095mg/kg), and AEI-B5 (0.0068mg/kg). None of these values exceeded the most stringent SCO, the NYSDEC Unrestricted SCO of 0.05 mg/kg for this compound. Arsenic was detected in soil samples AEI-B1 (2.2mg/kg) and AEI-B2 (1.9mg/kg); these concentrations do not exceed the most stringent comparison value, the NYSDEC Unrestricted SCO of 13 mg/kg for this compound.

Barium was detected in soil samples AEI-B1 (13.1mg/kg) and AEI-B2 (17.3mg/kg); these concentrations do not exceed the NYSDEC Unrestricted SCO of 350 mg/kg for this compound. Chromium was detected in soil samples AEI-B1 (18.3mg/kg) and AEI-B2 (14.9mg/kg). These concentrations do not exceed any SCOs. Lead was detected in soil samples AEI-B1 (18.2mg/kg) and AEI-B2 (5.4mg/kg); however, these concentrations do not exceed the most stringent NYSDEC Unrestricted SCO of 63 mg/kg for this compound. No VOCs or RCRA 13 Metals were detected in any of the soil samples collected, other than those noted above, and all PAHs and PCBs were non-detectable. AEI concluded, due to the lack of contaminants detected above the NYSDEC Unrestricted SCOs, the NYSDEC CP-51 Unrestricted Residential SCOs, and the NYSDEC CP-51 Commercial SCOs, it does not appear that a reportable release has occurred in the areas evaluated.

### **2.1.4 Remedial Investigation Report (EBC February 2016)**

EBC performed the following scope of work at the Site in September and December of 2015:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed seven soil borings across the Site, and collected fourteen soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed three groundwater monitoring wells throughout the Site and collected three groundwater samples and one duplicate groundwater sample for chemical analysis to evaluate groundwater quality;
4. Installed five soil gas implants and collected five soil gas samples for chemical analysis.

A remedial investigation was performed and the results are documented in a companion document called “Remedial Investigation Report, 264-12 Hillside Avenue”, dated February 2016 (RIR).

1. The elevation of the Site is approximately 109 feet above sea level.
2. Depth to groundwater is estimated to be approximately 66-67 feet below sidewalk grade.
3. Groundwater flow is generally southwest.
4. Depth to bedrock at the Site is greater than 100 feet.
5. The stratigraphy of the Site from the surface down consists of historic fill material to depths as great as 2 feet, underlain by native brown silty, sand and clay.
6. Soil/fill samples results were compared to the New York State Department of Environmental Conservation (NYSDEC) 6NYCRR Part 375 Section 6.8 Track 1 Unrestricted Use as well as to Track 2 Restricted Residential Use Soil Cleanup Objectives (SCOs). No PCBs were detected in any of the samples. Two pesticides, a-chlordane (max. of 9,200 µg/kg) and chlordane (max. of 94,000 µg/kg), were detected above Restricted Residential SCOs in the shallow soil samples. Several metals including arsenic (max. of 16 mg/kg), copper (max. of 105 mg/kg), lead (max. of 99.2 mg/kg) and mercury (max. of 0.54 mg/kg) exceeded Unrestricted Use SCOs within all shallow soil samples. Of these metals, arsenic also exceeded its Restricted Residential Use SCOs in one of the shallow soil samples. Overall, the soil results were consistent with data identified at sites with urban fill material in NYC.
7. Groundwater samples results were compared to New York State 6NYCRR Part 703.5 Class GA Groundwater Quality Standards (GQS). Groundwater samples collected during the investigations showed no pesticides at detectable concentrations. Several VOCs were detected with 1,1,1-trichloroethane (max. of 8 µg/L) 1,1,2-trichloroethane (4.5 µg/L),

1,1-dichloroethane (34 µg/L), 1,2-dichloroethane (10 µg/L), 1,2-dichloropropane (13 µg/L), 2,2-dichloropropane (14 µg/L), bromomethane (25 µg/L), carbon tetrachloride (19 µg/L), chloroethane (24 µg/L), Chloroform (6,600 µg/L), chloromethane (270 µg/L) and methylene chloride (max. of 85 µg/L) exceeding their respective GQS. Trichloroethene was detected in four of five groundwater samples. One SVOC, benzoic acid (max. of 240 µg/L) was detected in trace concentrations. One PCB, PCB-1016 (max. of 0.061 µg/L) was detected above GQS in one of the three samples and within the duplicate. Several metals were identified in groundwater, but only aluminum (max. of 0.908 mg/L), antimony (max. of 0.006 mg/L), chromium (max. of 0.74 mg/L), iron (max. of 0.58 mg/L), and sodium (max. of 1,210 mg/L) exceeded their respective GQS in all three groundwater samples and the duplicate.

8. Soil vapor samples collected during the RI were compared to the compounds listed in Table 3.1 Air Guideline Values Derived by the NYSDOH located in the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion dated October 2006. Soil vapor samples collected during the RI showed high levels of petroleum-related VOCs and chlorinated VOCs. The total concentration of petroleum-related VOCs (BTEX) ranged from 1,798.9 µg/m<sup>3</sup> to 5,254.3 µg/m<sup>3</sup>. The chlorinated VOC, trichloroethylene (TCE) was detected in two of the soil gas samples ranging in concentrations from 0.27 µg/m<sup>3</sup> to 1.5 µg/m<sup>3</sup>. Tetrachloroethylene (PCE) was detected in all soil gas samples ranging in concentration from 24.1 µg/m<sup>3</sup> to 416 µg/m<sup>3</sup>. Carbon tetrachloride (at 0.28 µg/m<sup>3</sup>) was detected in one of the soil gas samples. 1,1,1-trichloroethane (TCA) with a maximum concentration of 4.51 µg/m<sup>3</sup> was detected in one of the soil vapor sample. Concentrations of chlorinated VOC PCE were above the monitoring level ranges established within the NYSDOH soil vapor guidance matrix.

## 2.2 Redevelopment Plans

The proposed future use of the Site will consist of a new 2-story temple with a full cellar. The 5,550 square foot (sf) first floor will contain a 3,585 sf prayer hall, a 260 sf store, an elevator lobby, a vestibule, two storage rooms, a shoe rack room, an office, a bathroom, an elevator, and a stairwell. The 2,511 sf second floor will consist of 3 private priests' studies, storage, a bathroom, mechanical room, elevator and stairwell, as well as the care takers apartment. The cellar will be 5,550 sf in size and will contain a 2,812 sf dining hall, a kitchen, a walk in cooler, two bathrooms, two storage closets, a mechanical room, a utility closet, a stairwell and an elevator.

The cellar level will require excavation to a total depth of approximately 13 feet below grade and is approximately a 74 feet by 75 feet area. The remaining areas will not be excavated and will be paved or landscaped. The elevator shaft will be excavated an additional 5 feet below grade. Approximately 2,672 cubic yards (cy) (4,000 tons) of soil will be excavated for the cellar. The water table is approximately 66-67 feet below grade surface (bgs) and therefore, will not be encountered during excavation.

## 2.3 Description of Remedial Action

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establishment of Track 2 Restricted Residential Soil Cleanup Objectives (SCOs). Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs.
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas.
5. Completion of a Waste Characterization Study prior to excavation activities. Waste characterization soil samples will be collected at a frequency dictated by disposal facility(s).
6. Excavation and removal of soil/fill exceeding Track 2 Restricted Residential, SCOs. A 75 x 74 area (the cellar) will be excavated to a depth of approximately 13 feet below grade for development purposes. In addition the area of the elevator pit will be excavated an additional 5 feet. The remaining areas on site will not be excavated.
7. Screening of excavated soil/fill during intrusive work for indications of contamination by visual means, odor, and monitoring with a PID. Appropriate segregation of excavated media on-Site.
8. Management of excavated materials including temporarily stockpiling and segregating in accordance with defined material types and to prevent co-mingling of contaminated material and non-contaminated materials.
9. Removal of the waste oil UST and the heating oil UST. Registration of tanks and reporting of any petroleum spills associated with UST's and appropriate closure of these petroleum spills in compliance with applicable local, State and Federal laws and regulations.
10. Transportation and off-Site disposal of all soil/fill material at licensed or permitted facilities in accordance with applicable laws and regulations for handling, transport,

- and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media on-Site.
11. Demarcation of residual soil/fill in landscaped areas.
  12. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
  13. Construction of an engineered composite cover consisting of a six-inch thick concrete building slab in the cellar area. A six inch concrete slab or two feet of clean soil will be used to cap the unexcavated areas. Installation of a vapor barrier system consisting of vapor barrier beneath the building slab and outside of sub-grade foundation sidewalls. The vapor barrier system will consist of a 20-mil Raven Industries VaporBlock 20+ below the slab throughout the full building area and a 20-mil Raven Industries VaporBlock 20+ outside all sub-grade foundation sidewalls. All welds, seams and penetrations will be properly sealed to prevent preferential pathways for vapor migration. The vapor barrier system is an Engineering Control for the remedial action. The remedial engineer will certify in the RAR that the vapor barrier system was designed and properly installed to mitigate soil vapor migration into the building
  14. Installation of an active sub-slab depressurization system (SSDS) consisting of three loops installed beneath the basement slab of the building. The SSDS loops will provide the correct coverage in accordance with USEPA sub-slab depressurization design specifications which recommend a separate vent loop for every 4,000 ft<sup>2</sup> of slab area. The horizontal vent line is to be constructed of a continuous loop of perforated 4-inch HDPE pipe fitted with a filter sock. Fill material around the horizontal vent piping will be RCA or virgin-mined, ¾ inch gravel with round edges. The horizontal pipe will extend to an adjacent utility chase-way where it will be piped to the roof via a 6-inch schedule 40 Cast Iron line. The exhaust stack will be located a minimum of 10 feet from windows and ventilation inlets and a minimum of 6" above the roof line as per MC512.4 All other applicable provisions of the NYC BC, MC, and PC shall be complied with. The active SSDS will be hardwired and will include a blower installed on the roof line and a pressure gauge and alarm located in an accessible area in the basement. The active sub-slab depressurization system is an Engineering Control for the remedial action. The remedial engineer will certify in the RAR that the active sub-slab depressurization system was designed and properly installed to establish a vacuum in the gas permeable layer and a negative (decreasing outward) pressure gradient across the building slab to prevent vapor migration into the building.
  15. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
  16. Performance of all activities required for the remedial action, including acquisition of required permits and attainment of pretreatment requirements, in compliance with applicable laws and regulations.
  17. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
  18. Submission of a RAR that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, lists any changes from this RAWP, and describes all Engineering and Institutional Controls to be implemented at the Site.

19. Submission of an approved Site Management Plan (SMP) in the Remedial Action Plan (RAR) for long-term management of residual contamination, including plans for operation, maintenance, monitoring, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency.
20. The property will continue to be registered with an E-Designation at the NYC Buildings Department. Establishment of Engineering Controls and Institutional Controls in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP. Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher level of land usage without OER-approval.

### **3.0 HAZARD ASSESSMENT**

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.

#### **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 Climbing Hazards*

During site activities, workers may have to work on excavating equipment by climbing. The excavating contractor will conform with any applicable NIOSH and OSHA requirements or climbing activities.

##### *3.1.3 Cuts and Lacerations*

Field activities that involve excavating activities usually involve contact with various types of machinery. A first aid kit approved by the American Red Cross will be available during all intrusive activities.

##### *3.1.4 Lifting Hazards*

Improper lifting by workers is one of the leading causes of industrial injuries. Field workers in the excavation program may be required to lift heavy objects. 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.

##### *3.1.5 Utility Hazards*

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

##### *3.1.6 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 of 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 hot skin, dry mouth, dizziness, nausea, headache, 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: Revise based on Remedial Investigation Report Results: pesticides such as chlordane and a-chlordane and heavy metals such as arsenic, copper, and mercury.

The primary routes of exposure to these contaminants are inhalation, ingestion and absorption.

### 3.3.1 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/m<sup>3</sup> 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.

### 3.3.2 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/m<sup>3</sup> 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.

### 3.3.3 Organic Vapors

Elevated levels of VOCs were detected in both soil and soil vapor samples collected during

previous investigations at the site. Therefore, excavation activities may cause the release of organic vapors to the atmosphere. The site safety officer will periodically monitor organic vapors with a Photoionization Detector (PID) during excavation activities to determine whether organic vapor concentrations exceed action levels shown in Section 5 and/or the Community Air Monitoring Plan.

## 4.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) shall be selected in accordance with the site air monitoring program, 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;
- 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;
- 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.

- chemical resistant coveralls;
- steel-toe and steel-shank workboots;
- chemical resistant overboots or disposable boot covers;
- disposable inner gloves;
- disposable outer gloves;
- hard hat; and,
- ankles/wrists taped.

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 on air monitoring results (Section 4.0) and properties of identified or expected contaminants. **It is expected that site work will be performed in Level D.** If air monitoring results indicate the necessity to upgrade the level of protection engineering controls (i.e. Facing equipment away from the wind and placing site personnel upwind of drilling locations, active venting, etc.) will be implemented before requiring the use of respiratory protection.

## 5.0 AIR MONITORING AND ACTION LEVELS

29 CFR 1910.120(h) specifies that monitoring shall be performed where there may be a question of employee exposure to hazardous concentrations of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment so that employees are not exposed to levels which exceed permissible exposure limits, or published exposure levels if there are no permissible exposure limits, for hazardous substances.

### 5.1 Air Monitoring Requirements

If excavation work is performed, air will be monitored for VOCs with a portable ION Science 3000EX photoionization detector, or the equivalent. If necessary, Lower Explosive Limit (LEL) and oxygen will be monitored with a Combustible Gas Indicator (CGI). If appropriate, fugitive dust will be monitored using a MiniRam Model PDM-3 aerosol monitor. Air will be monitored when any of the following conditions apply:

- initial site entry;
- during any work where a potential IDLH condition or flammable atmosphere could develop;
- excavation work begins on another portion of the site;
- contaminants, other than those previously identified, have been discovered;
- each time a different task or activity is initiated;
- during trenching and/or excavation work.

The designated site safety officer will record air monitoring data and ensure that air monitoring instruments are calibrated and maintained in accordance with manufacturer's specifications. Instruments will be zeroed daily and checked for accuracy. Monitoring results will be recorded in a field notebook and will be transferred to instrument reading logs.

### 5.2 Work Stoppage Responses

The following responses will be initiated whenever one or more of the action levels necessitating a work stoppage are exceeded:

- 1 The SSO will be consulted immediately
- 2 All personnel (except as necessary for continued monitoring and contaminant migration, if applicable) will be cleared from the work area (eg from the exclusion zone).
- 3 Monitoring will be continued until intrusive work resumes.

### 5.3 Action Levels During Excavation Activities

Instrument readings will be taken in the breathing zone above the excavation pit unless otherwise noted. Each action level is independent of all other action levels in determining responses.

Organic Vapors (PID)	LEL %	Responses
0-1 ppm above background	0%	<ul style="list-style-type: none"> <li>• Continue excavating</li> <li>• Level D protection</li> <li>• Continue monitoring every 10 minutes</li> </ul>

1-5 ppm Above Background, Sustained Reading	1-10%	<ul style="list-style-type: none"> <li>• Continue excavating</li> <li>• Go to Level C protection or employ engineering controls</li> <li>• Continue monitoring every 10 minutes</li> </ul>
5-25 ppm Above Background, Sustained Reading	10-20%	<ul style="list-style-type: none"> <li>• Discontinue excavating, unless PID is only action level exceeded.</li> <li>• Level C protection or employ engineering controls</li> <li>• Continue monitoring for organic vapors 200 ft downwind</li> <li>• Continuous monitoring for LEL at excavation pit</li> </ul>
>25 ppm Above Background, Sustained Reading	>20%	<ul style="list-style-type: none"> <li>• Discontinue excavating</li> <li>• Withdraw from area, shut off all engine ignition sources.</li> <li>• Allow pit to vent</li> <li>• Continuous monitoring for organic vapors 200 ft downwind.</li> </ul>

Notes: Air monitoring will occur in the breathing zone 30 inches above the excavation pit. Readings may also be taken in the excavation pit but will not be used for action levels.

If action levels for any one of the monitoring parameters are exceeded, the appropriate responses listed in the right hand column should be taken. If instrument readings do not return to acceptable levels after the excavation pit has been vented for a period of greater than one-half hour, a decision will then be made whether or not to seal the pit with suppressant foam.

If, during excavation activities, downwind monitoring PID readings are greater than 5 ppm above background for more than one-half hour, excavation will stop until sustained levels are less than 5 ppm (see Community Air Monitoring Plan).

## 6.0 SITE CONTROL

### 6.1 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.

**Due to the dimensions of the Site and the work area, it is expected that an exclusion zone will include the entire fenced area with the exception of the construction entrance area, which will serve as the decontamination zone. A support zone if needed will be located outside of the fenced area.** All onsite workers engaged in the excavation of hazardous or contaminated materials must provide evidence of OSHA 24 or 40-hour Hazardous Waste Operations and Emergency Response Operations training to conduct work within the exclusion zone established by the site safety officer. 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.

## 7.0 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.

### 7.1 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.

### 7.2 Emergency Telephone Numbers

General Emergencies	911
New York City Police	911
Long Island Jewish Medical Center	1-516-470-7390
NYSDEC Spills Division	1-800-457-7362
NYSDEC Hazardous Waste Division	1-718-482-4994
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	1-212-340-4494
Site Safety Officer	1-631-504-6000
Alternate Site Safety Officer	1-631-504-6000

### 7.3 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             | Mrs. Chawinie Reilly (631) 504-6000 |
| • Construction Superintendent | To be added                         |
| • Site Safety Officer         | Mr. Kevin Waters (631) 504-6000     |

#### 7.4 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**).

#### 7.5 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.

#### 7.6 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.

### 7.7 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.

### 7.8 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.

### 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	: $\alpha$ -Chlordane	
Product Number	: 442449	
Brand	: Supelco	
Product Use	: For laboratory research purposes.	
Supplier	: Sigma-Aldrich 3050 Spruce Street SAINT LOUIS MO 63103 USA	Manufacturer : Sigma-Aldrich Corporation 3050 Spruce St. St. Louis, Missouri 63103 USA
Telephone	: +1 800-325-5832	
Fax	: +1 800-325-5052	
Emergency Phone # (For both supplier and manufacturer)	: (314) 776-6555	
Preparation Information	: Sigma-Aldrich Corporation Product Safety - Americas Region 1-800-521-8956	

### 2. HAZARDS IDENTIFICATION

#### Emergency Overview

##### OSHA Hazards

Toxic by inhalation., Toxic by ingestion, Toxic by skin absorption, Irritant

##### GHS Classification

Acute toxicity, Inhalation (Category 4)  
Acute toxicity, Oral (Category 4)  
Acute toxicity, Dermal (Category 3)  
Skin irritation (Category 2)  
Eye irritation (Category 2A)  
Specific target organ toxicity - single exposure (Category 3)  
Acute aquatic toxicity (Category 1)

##### GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H302 + H332	Harmful if swallowed or if inhaled.
H311	Toxic in contact with skin.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H400	Very toxic to aquatic life.

Precautionary statement(s)

P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P312

Call a POISON CENTER or doctor/ physician if you feel unwell.

**HMIS Classification**

**Health hazard:** 2  
**Flammability:** 0  
**Physical hazards:** 0

**NFPA Rating**

**Health hazard:** 2  
**Fire:** 0  
**Reactivity Hazard:** 0

**Potential Health Effects**

**Inhalation** Toxic if inhaled. Causes respiratory tract irritation.  
**Skin** Toxic if absorbed through skin. Causes skin irritation.  
**Eyes** Causes eye irritation.  
**Ingestion** Toxic if swallowed.

---

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Molecular Weight : 208.29 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
<b>Chlordane</b>			
5103-71-9	225-825-5	-	-

---

**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. Take victim immediately to hospital. 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.

**Hazardous combustion products**

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas

---

**6. ACCIDENTAL RELEASE MEASURES**

**Personal precautions**

Wear respiratory protection. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

**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. Sweep up and shovel. 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.

---

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.

### Personal protective equipment

#### Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N99 (US) or type P2 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

#### Hand protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

#### Eye protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

#### Skin and body protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

#### Hygiene measures

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

---

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Appearance

Form crystalline

Colour colourless

### Safety data

pH no data available

Melting/freezing point 93.0 - 94.0 °C (199.4 - 201.2 °F)

Boiling point no data available

Flash point no data available

Ignition temperature no data available

Autoignition temperature no data available

Lower explosion limit no data available

Upper explosion limit no data available

Vapour pressure no data available

Density	no data available
Water solubility	no data available
Partition coefficient: n-octanol/water	no data available
Relative vapour density	no data available
Odour	no data available
Odour Threshold	no data available
Evaporation rate	no data available

---

## 10. STABILITY AND REACTIVITY

### Chemical stability

Stable under recommended storage conditions.

### Possibility of hazardous reactions

no data available

### Conditions to avoid

no data available

### Materials to avoid

Strong oxidizing agents

### Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas  
Other decomposition products - no data available

---

## 11. TOXICOLOGICAL INFORMATION

### Acute toxicity

#### Oral LD50

LD50 Oral - rat - 500.0 mg/kg

#### Inhalation LC50

#### Dermal LD50

#### Other information on acute toxicity

no data available

### Skin corrosion/irritation

no data available

### Serious eye damage/eye irritation

no data available

### Respiratory or skin sensitization

no data available

### Germ cell mutagenicity

no data available

### Carcinogenicity

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.

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

**Teratogenicity**

no data available

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

no data available

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

no data available

**Aspiration hazard**

no data available

**Potential health effects**

<b>Inhalation</b>	Toxic if inhaled. Causes respiratory tract irritation.
<b>Ingestion</b>	Toxic if swallowed.
<b>Skin</b>	Toxic if absorbed through skin. Causes skin irritation.
<b>Eyes</b>	Causes eye irritation.

**Synergistic effects**

no data available

**Additional Information**

RTECS: Not available

---

**12. ECOLOGICAL INFORMATION****Toxicity**

Toxicity to fish LC50 - Lepomis macrochirus (Bluegill) - 0.0074 mg/l - 96 h

**Persistence and degradability**

no data available

**Bioaccumulative potential**

Bioaccumulation Lepomis macrochirus (Bluegill) - 24 h  
Bioconcentration factor (BCF): 322

**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 life.

no data available

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

Very toxic to aquatic life.

---

**13. DISPOSAL CONSIDERATIONS****Product**

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

**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. (Chlordane)  
Marine pollutant:  
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. (Chlordane)  
Marine pollutant: Marine pollutant

### IATA

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

### 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.

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## 15. REGULATORY INFORMATION

### OSHA Hazards

Toxic by inhalation., Toxic by ingestion, Toxic by skin absorption, Irritant

### DSL Status

This product contains the following components that are not on the Canadian DSL nor NDSL lists.

Chlordane

CAS-No.  
5103-71-9

### 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

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

### SARA 311/312 Hazards

Acute Health Hazard

### Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

### Pennsylvania Right To Know Components

Chlordane

CAS-No.                      Revision Date  
5103-71-9

### New Jersey Right To Know Components

Chlordane

CAS-No.                      Revision Date  
5103-71-9

### California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

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## 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.

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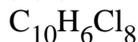
# International Chemical Safety Cards

## CHLORDANE (TECHNICAL PRODUCT)

ICSC: 0740



1,2,4,5,6,7,8,8-Octachloro-2,3,3a,4,7,7a-hexahydro-4,7-methanoindene  
1,2,4,5,6,7,8,8-Octachloro-2,3,3a,4,7,7a-hexahydro-4,7-methano-1H-indene



Molecular mass: 409.8

ICSC # 0740

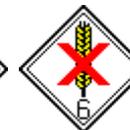
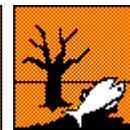
CAS # 57-74-9

RTECS #

UN # 2996

EC # 602-047-00-8

March 26, 1998 Peer reviewed



TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
<b>FIRE</b>	Liquid formulations containing organic solvents may be flammable. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames.	Alcohol-resistant foam, powder, carbon dioxide.
<b>EXPLOSION</b>			
<b>EXPOSURE</b>		PREVENT GENERATION OF MISTS! STRICT HYGIENE! AVOID EXPOSURE OF ADOLESCENTS AND CHILDREN!	IN ALL CASES CONSULT A DOCTOR!
<b>•INHALATION</b>	(See Ingestion).	Breathing protection.	Fresh air, rest. Refer for medical attention.
<b>•SKIN</b>	MAY BE ABSORBED!	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
<b>•EYES</b>	Redness. Pain.	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.
<b>•INGESTION</b>	Confusion. Convulsions. Nausea. Vomiting.	Do not eat, drink, or smoke during work. Wash hands before eating.	Rest. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent and remove to safe place. Do NOT wash away into sewer. Personal protection: chemical protection suit including self-contained breathing apparatus.	Provision to contain effluent from fire extinguishing. Separated from food and feedstuffs bases and incompatible materials See Chemical Dangers. Well closed. Keep in a well-ventilated room.	Do not transport with food and feedstuffs. Severe marine pollutant. Xn symbol N symbol R: 21/22-40-50/53 S: 2-36/37-60-61 UN Hazard Class: 6.1 UN Packing Group: III

**SEE IMPORTANT INFORMATION ON BACK**

**ICSC: 0740**

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

## CHLORDANE (TECHNICAL PRODUCT)

ICSC: 0740

<p><b>I M P O R T A N T A D V I S O R Y</b></p>	<p><b>PHYSICAL STATE; APPEARANCE:</b> TECHNICAL: LIGHT YELLOW TO AMBER VISCOUS LIQUID</p> <p><b>PHYSICAL DANGERS:</b></p> <p><b>CHEMICAL DANGERS:</b> The substance decomposes on burning, on contact with bases producing toxic fumes including phosgene hydrogen chloride Attacks iron, zinc, plastic, rubber and coatings.</p> <p><b>OCCUPATIONAL EXPOSURE LIMITS:</b> TLV: 0.5 mg/m<sup>3</sup> as TWA (skin) A3 (confirmed animal carcinogen with unknown relevance to humans); (ACGIH 2004). MAK: (Inhalable fraction) 0.5 mg/m<sup>3</sup> Peak limitation category: II(8); skin absorption (H); Carcinogen category: 3B; (DFG 2004). OSHA PEL: TWA 0.5 mg/m<sup>3</sup> skin NIOSH REL: Ca TWA 0.5 mg/m<sup>3</sup> skin <a href="#">See Appendix A</a> NIOSH IDLH: Ca 100 mg/m<sup>3</sup> See: <a href="#">57749</a></p>	<p><b>ROUTES OF EXPOSURE:</b> The substance can be absorbed into the body by inhalation, through the skin and by ingestion.</p> <p><b>INHALATION RISK:</b> Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly on spraying.</p> <p><b>EFFECTS OF SHORT-TERM EXPOSURE:</b> Exposure at high levels may result in disorientation, tremors, convulsions, respiratory failure and death. Medical observation is indicated.</p> <p><b>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:</b> The substance may have effects on the liver immune system, resulting in tissue lesions and liver impairment. This substance is possibly carcinogenic to humans.</p>
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<p><b>PHYSICAL PROPERTIES</b></p>	<p>Boiling point at 0.27kPa: 175°C Relative density (water = 1): 1.59-1.63 Solubility in water: none</p>	<p>Vapour pressure, Pa at 25°C: 0.0013 Octanol/water partition coefficient as log Pow: 2.78</p>
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<p><b>ENVIRONMENTAL DATA</b></p>	<p>The substance is very toxic to aquatic organisms. This substance may be hazardous to the environment; special attention should be given to soil organisms, honey bees. It is strongly advised that this substance does not enter the environment. The substance may cause long-term effects in the aquatic environment.</p>	
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### NOTES

If the substance is formulated with solvents also consult the ICSCs of these materials. Carrier solvents used in commercial formulations may change physical and toxicological properties. Belt, Chlor Kil, Chlortox, Corodan, Gold Crest, Intox, Kypchlor, Niran, Octachlor, Sydane, Synklor, Termi-Ded, Topiclör, and Toxichlor are trade names. Also consult ICSC 0743 Heptachlor.

Transport Emergency Card: TEC (R)-61GT6-III

### ADDITIONAL INFORMATION

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ICSC: 0740

CHLORDANE (TECHNICAL PRODUCT)

(C) IPCS, CEC, 1994

<p><b>IMPORTANT LEGAL NOTICE:</b></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

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
<b>FIRE</b>	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.
<b>EXPLOSION</b>	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.	
<b>EXPOSURE</b>		PREVENT DISPERSION OF DUST! AVOID ALL CONTACT! AVOID EXPOSURE OF (PREGNANT) WOMEN!	IN ALL CASES CONSULT A DOCTOR!
<b>•INHALATION</b>	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.
<b>•SKIN</b>	Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
<b>•EYES</b>	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.
<b>•INGESTION</b>	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

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

**ARSENIC**

**ICSC: 0013**

<p><b>I M P O R T A N T D A T A</b></p>	<p><b>PHYSICAL STATE; APPEARANCE:</b> ODOURLESS, BRITTLE, GREY, METALLIC-LOOKING CRYSTALS.</p> <p><b>PHYSICAL DANGERS:</b></p> <p><b>CHEMICAL DANGERS:</b> 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><b>OCCUPATIONAL EXPOSURE LIMITS:</b> TLV: 0.01 mg/m<sup>3</sup> 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/m<sup>3</sup> NIOSH REL: Ca C 0.002 mg/m<sup>3</sup> 15-minute <a href="#">See Appendix A</a> NIOSH IDLH: Ca 5 mg/m<sup>3</sup> (as As) See: <a href="#">7440382</a></p>	<p><b>ROUTES OF EXPOSURE:</b> The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.</p> <p><b>INHALATION RISK:</b> Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly, when dispersed.</p> <p><b>EFFECTS OF SHORT-TERM EXPOSURE:</b> 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><b>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:</b> 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><b>PHYSICAL PROPERTIES</b></p>	<p>Sublimation point: 613°C Density: 5.7 g/cm<sup>3</sup></p>	<p>Solubility in water: none</p>
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<p><b>ENVIRONMENTAL DATA</b></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**

(C) IPCS, CEC, 1994

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# International Chemical Safety Cards

**COPPER**

ICSC: 0240



Cu  
(powder)

ICSC # 0240

CAS # 7440-50-8

RTECS # [GL5325000](#)

September 24, 1993 Validated

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
<b>FIRE</b>	Combustible.	NO open flames.	Special powder, dry sand, NO other agents.
<b>EXPLOSION</b>			
<b>EXPOSURE</b>		PREVENT DISPERSION OF DUST!	
• <b>INHALATION</b>	Cough. Headache. Shortness of breath. Sore throat.	Local exhaust or breathing protection.	Fresh air, rest. Refer for medical attention.
• <b>SKIN</b>	Redness.	Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
• <b>EYES</b>	Redness. Pain.	Safety goggles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• <b>INGESTION</b>	Abdominal pain. Nausea. Vomiting.	Do not eat, drink, or smoke during work.	Rinse mouth. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers. Carefully collect remainder. Then remove to safe place. (Extra personal protection: P2 filter respirator for harmful particles).	Separated from - See Chemical Dangers.	R: S:

**SEE IMPORTANT INFORMATION ON BACK**

**ICSC: 0240**

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

**COPPER**

ICSC: 0240

<p><b>I</b></p> <p><b>M</b></p> <p><b>P</b></p>	<p><b>PHYSICAL STATE; APPEARANCE:</b> RED POWDER, TURNS GREEN ON EXPOSURE TO MOIST AIR.</p> <p><b>PHYSICAL DANGERS:</b></p> <p><b>CHEMICAL DANGERS:</b></p>	<p><b>ROUTES OF EXPOSURE:</b> The substance can be absorbed into the body by inhalation and by ingestion.</p> <p><b>INHALATION RISK:</b> Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.</p>
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Shock-sensitive compounds are formed with acetylenic compounds, ethylene oxides and azides. Reacts with strong oxidants like chlorates, bromates and iodates, causing explosion hazard.

**EFFECTS OF SHORT-TERM EXPOSURE:**  
Inhalation of fumes may cause metal fume fever. See Notes.

**OCCUPATIONAL EXPOSURE LIMITS:**  
TLV: 0.2 mg/m<sup>3</sup> fume (ACGIH 1992-1993).  
TLV (as Cu, dusts & mists): 1 mg/m<sup>3</sup> (ACGIH 1992-1993).  
Intended change 0.1 mg/m<sup>3</sup>  
Inhal.,  
A4 (not classifiable as a human carcinogen);  
MAK: 0.1 mg/m<sup>3</sup> (Inhalable fraction)  
Peak limitation category: II(2) Pregnancy risk group: D (DFG 2005).  
OSHA PEL\*: TWA 1 mg/m<sup>3</sup> \*Note: The PEL also applies to other copper compounds (as Cu) except copper fume.  
NIOSH REL\*: TWA 1 mg/m<sup>3</sup> \*Note: The REL also applies to other copper compounds (as Cu) except Copper fume.  
NIOSH IDLH: 100 mg/m<sup>3</sup> (as Cu) See: [7440508](#)

**EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:**  
Repeated or prolonged contact may cause skin sensitization.

<b>PHYSICAL PROPERTIES</b>	Boiling point: 2595°C Melting point: 1083°C Relative density (water = 1): 8.9	Solubility in water: none
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<b>ENVIRONMENTAL DATA</b>	
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**NOTES**

The symptoms of metal fume fever do not become manifest until several hours.

**ADDITIONAL INFORMATION**

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**ICSC: 0240**

**COPPER**

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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
<b>FIRE</b>	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.		In case of fire in the surroundings: use appropriate extinguishing media.
<b>EXPLOSION</b>	Risk of fire and explosion.		In case of fire: keep drums, etc., cool by spraying with water.
<b>EXPOSURE</b>		STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN! AVOID EXPOSURE OF ADOLESCENTS AND CHILDREN!	IN ALL CASES CONSULT A DOCTOR!
<b>•INHALATION</b>	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.
<b>•SKIN</b>	MAY BE ABSORBED! Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention.
<b>•EYES</b>		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.
<b>•INGESTION</b>		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><b>I</b> <b>M</b> <b>P</b> <b>O</b> <b>R</b> <b>T</b> <b>A</b> <b>N</b> <b>T</b> <b>D</b> <b>A</b> <b>T</b> <b>A</b></p>	<p><b>PHYSICAL STATE; APPEARANCE:</b> ODOURLESS, HEAVY AND MOBILE SILVERY LIQUID METAL.</p> <p><b>PHYSICAL DANGERS:</b></p> <p><b>CHEMICAL DANGERS:</b> 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><b>OCCUPATIONAL EXPOSURE LIMITS:</b> TLV: 0.025 mg/m<sup>3</sup> as TWA (skin) A4 BEI issued (ACGIH 2004). MAK: 0.1 mg/m<sup>3</sup> Sh Peak limitation category: II(8) Carcinogen category: 3B (DFG 2003). OSHA PEL<sub>f</sub>: C 0.1 mg/m<sup>3</sup> NIOSH REL: Hg Vapor: TWA 0.05 mg/m<sup>3</sup> skin Other: C 0.1 mg/m<sup>3</sup> skin NIOSH IDLH: 10 mg/m<sup>3</sup> (as Hg) See: <a href="#">7439976</a></p>	<p><b>ROUTES OF EXPOSURE:</b> The substance can be absorbed into the body by inhalation of its vapour and through the skin, also as a vapour!</p> <p><b>INHALATION RISK:</b> A harmful contamination of the air can be reached very quickly on evaporation of this substance at 20°C.</p> <p><b>EFFECTS OF SHORT-TERM EXPOSURE:</b> 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><b>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:</b> 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><b>PHYSICAL PROPERTIES</b></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><b>ENVIRONMENTAL DATA</b></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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<b>ICSC: 0056</b>	(C) IPCS, CEC, 1994	<b>MERCURY</b>
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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.)? \_\_\_\_\_  
\_\_\_\_\_

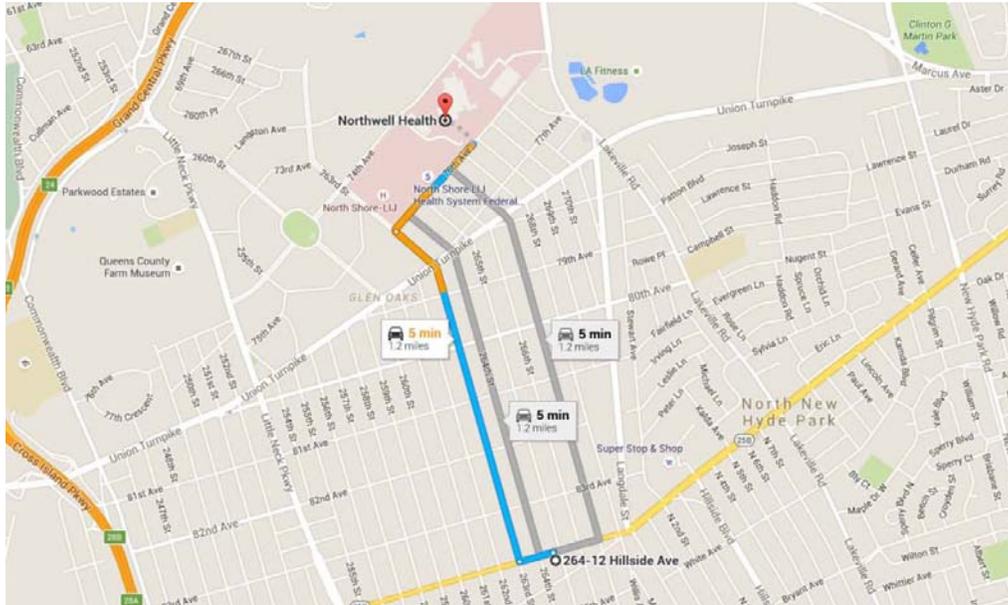
(If not, it is the EMPLOYEE'S sole responsibility to process his/her claim through his/her Health and Welfare Fund.)

INDICATE STREET NAMES, DESCRIPTION OF VEHICLES, AND NORTH ARROW

## HOSPITAL INFORMATION AND MAP

The hospital nearest the site is:

**Long Island Jewish Medical Center**  
 270-05 76<sup>th</sup> Avenue, New Hyde Park, NY 11040  
 516-470-7390  
 1.2 Miles – About 5 Minutes



### 264-12 Hillside Ave

Glen Oaks, NY 11004

- ↑ 1. Head west on Hillside Avenue toward 264th St 446 ft

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- ↘ 2. Turn right at the 2nd cross street onto 263rd St 0.9 mi

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- ↘ 3. Turn right onto 76th Ave 0.3 mi  
i Destination will be on the left

### Northwell Health

270-05 76th Avenue, New Hyde Park, NY 11040

**APPENDIX 6**  
**VAPOR BARRIER**  
**SPECIFICATIONS**

# VaporBlock®

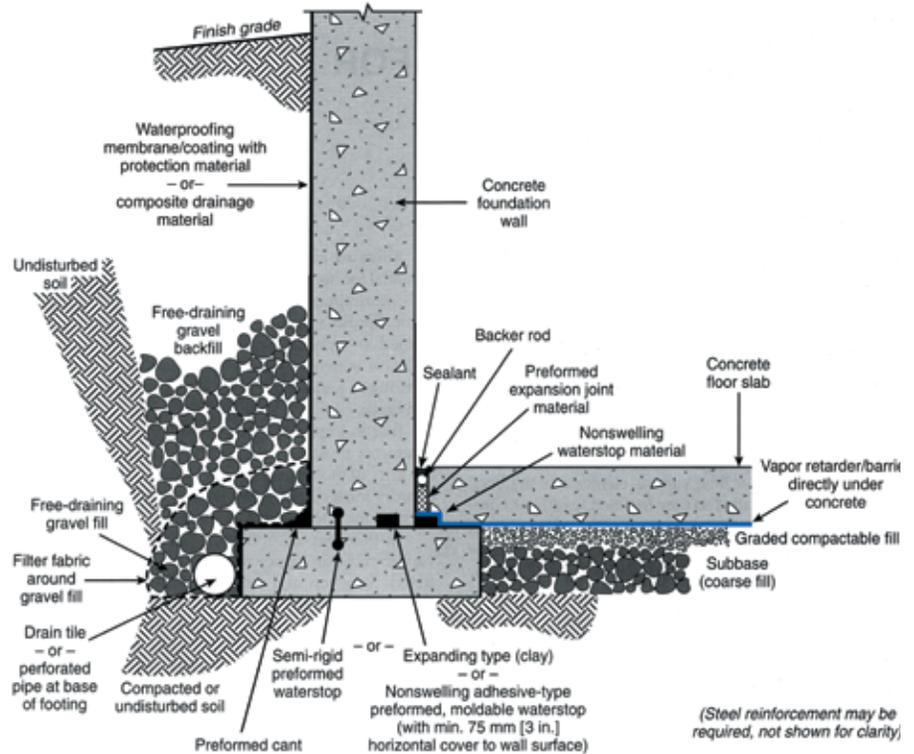
UNDERSLAB VAPOR RETARDER

## INSTALLATION GUIDELINES

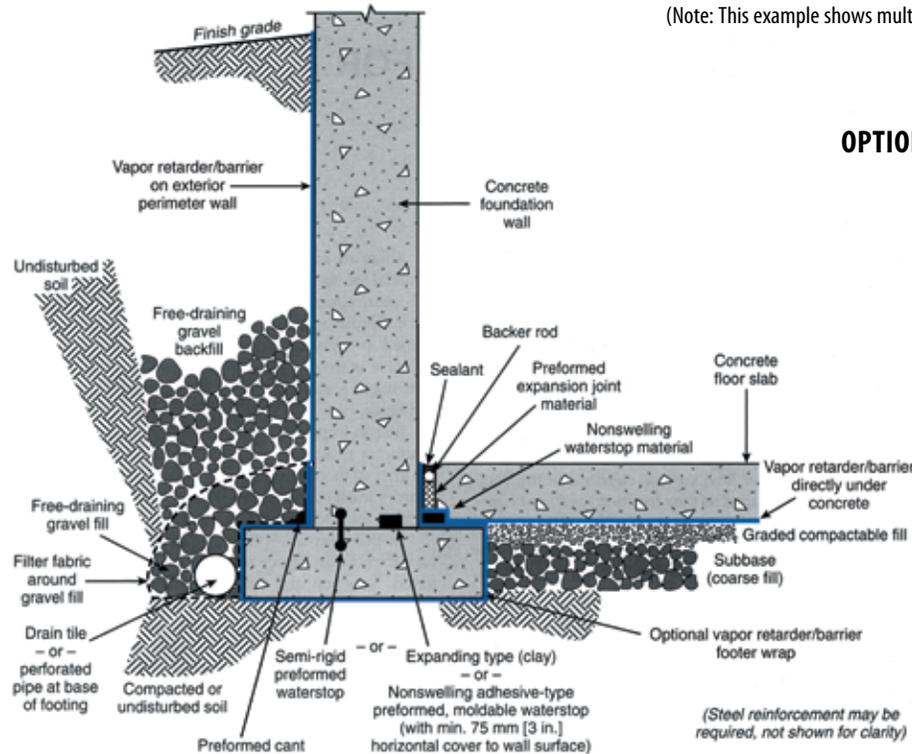
**Please Note:** Read these instructions thoroughly before installation to ensure proper use of VaporBlock®. ASTM E 1643 can also provide valuable information regarding the installation of vapor retarders. When installing this product, contractors shall conform to all applicable local, state and federal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

### Materials List:

VaporBlock® Vapor Retarder (Barrier)  
 VaporBond 4" Seaming Tape  
 Butyl Seal 2-Sided Tape  
 VaporBoot Pipe Boot System 25/Tube plus Tape  
 VaporBoot Tape (optional)



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



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

### OPTIONAL PERIMETER WALL & FOOTER METHODS

An optional perimeter wall class "A" vapor retarder can be installed with or without a bituminous coating applied to the concrete.

Raven VaporBlock® 10 or 15 mil (Class A) vapor retarders can be sealed to the perimeter wall with Raven Butyl Seal Tape. An optional footer wrap may also be applied.

Original diagrams on this page were reprinted with permission by the Portland Cement Association. Reference: Kanare, Howard M., Concrete Floors and Moisture, EB119, Portland Cement Association, Skokie, Illinois, and National Ready Mixed Concrete Association, Silver Spring, Maryland, USA, 2008, 176 pages.

## VAPORBLOCK® PLACEMENT

- Level and tamp or roll granular base as specified by your architectural or structural drawings. If sharp crushed rock is used, a 1/2" layer of fine grade compactable fill is required between the base and the vapor retarder.
- Unroll **VaporBlock®** running the longest dimension parallel with the direction of the pour and pull open all folds to full width. (Fig. 1)
- Lap **VaporBlock®** over the footings and seal with Raven 2-sided Butyl Seal tape. Prime concrete surfaces and assure they are dry and clean prior to applying Raven Butyl Seal Tape. Apply even and firm pressure with a rubber roller.

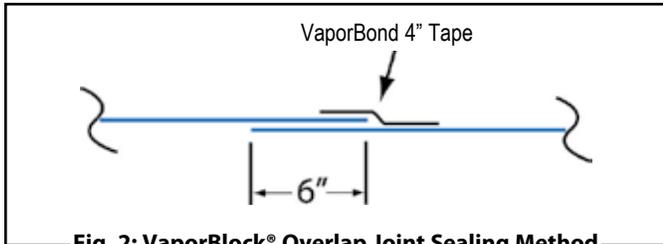


Fig. 2: VaporBlock® Overlap Joint Sealing Method

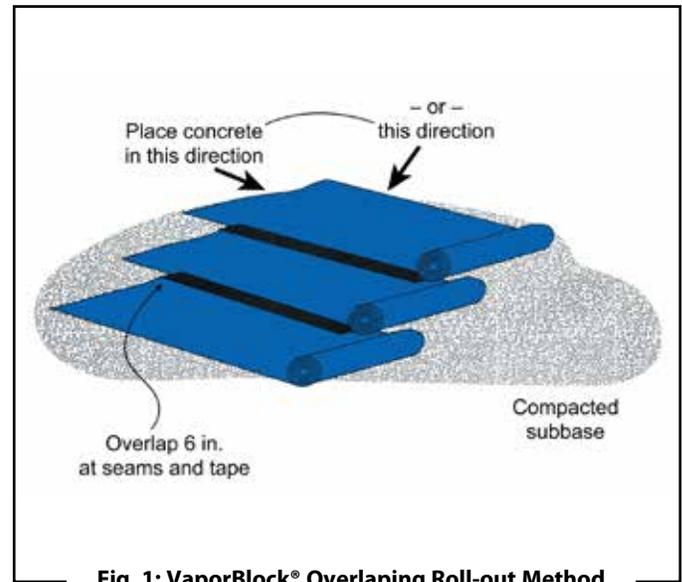


Fig. 1: VaporBlock® Overlapping Roll-out Method

## SINGLE PENETRATION PIPE BOOT INSTALLATION

Overlap joints a minimum of 6" and seal overlap with Raven VaporBond Tape.

- Seal around all plumbing, conduit, support columns or other penetrations that come through the **VaporBlock®** membrane. The Raven VaporBoot Pipe Boot System is the recommended sealing method. (Includes 25 pre-cut VaporBlock® pipe boots along with 1 roll of VaporBoot Tape). (Fig. 3 & 4)

Pipe boots may also be fabricated from excess **VaporBlock®** membrane (Fig. 3 & 4) and sealed with VaporBoot Tape or VaporBond Tape (sold separately).

*Reminder Note: All holes or penetrations through the membrane will need a patch cut to a minimum of 6" from the opening in all directions.*

To fabricate pipe boots from **VaporBlock®** excess material (see Fig. 3 & 4 for A-E):

- Cut a square large enough to overlap 6" in all directions.
- Mark where to cut opening on the center of the square and cut four to eight slices about 3/8" less than the diameter of the pipe.

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

- Use VaporBoot Tape or VaporBond Tape to secure the boot to the pipe.

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

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

- Complete the process by taping over the boot perimeter edge with VaporBond Tape to create a monolithic membrane between the surface of the slab and moisture sources below and at the slab perimeter. (Fig. 3 & 4)

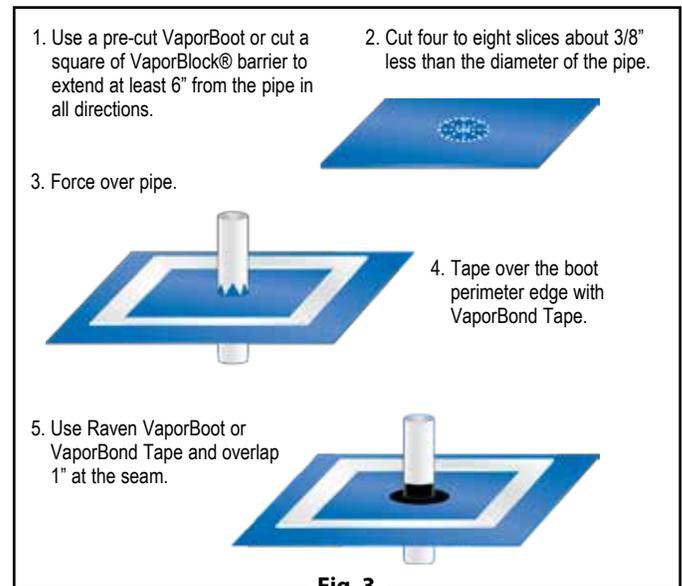


Fig. 3

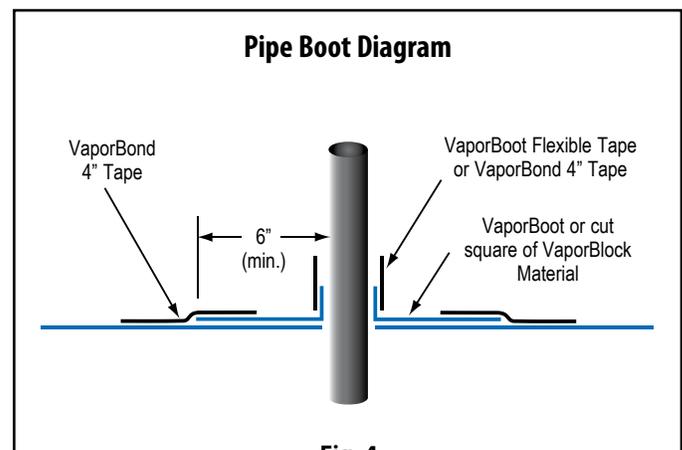


Fig. 4

## MULTIPLE PENETRATION PIPE BOOT INSTALLATION

1.5. For side-by-side multiple penetrations;

- A) Cut a patch large enough to overlap 6" in all directions (Fig. 6) of penetrations.
- B) Mark where to cut openings and cut four to eight slices about 3/8" less than the diameter of the penetration for each.
- C) Slide patch material over penetration to achieve a tight fit.
- D) Tape around each of the penetrations and the patch with VaporBond 4" Tape. (Fig. 7) For additional protection apply an acceptable polyurethane elastomeric sealant around the penetrations. (Fig. 8)

1.6. Holes or openings through **VaporBlock®** are to be repaired by cutting a piece of **VaporBlock®** 6" larger in all directions from the opening. Seal the edges of the patch with VaporBond Tape.

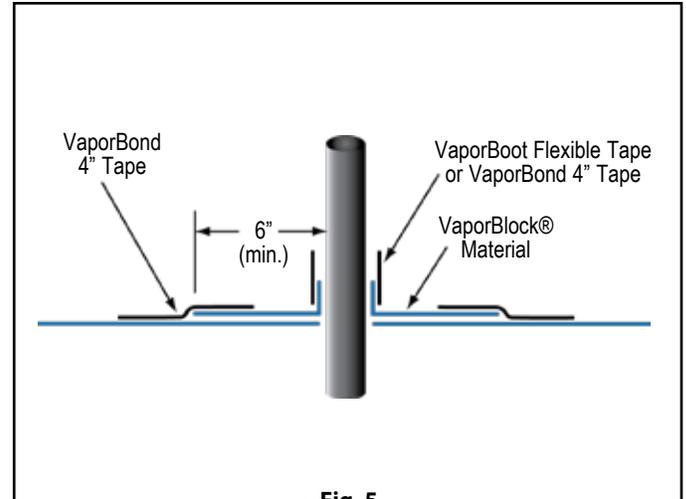


Fig. 5

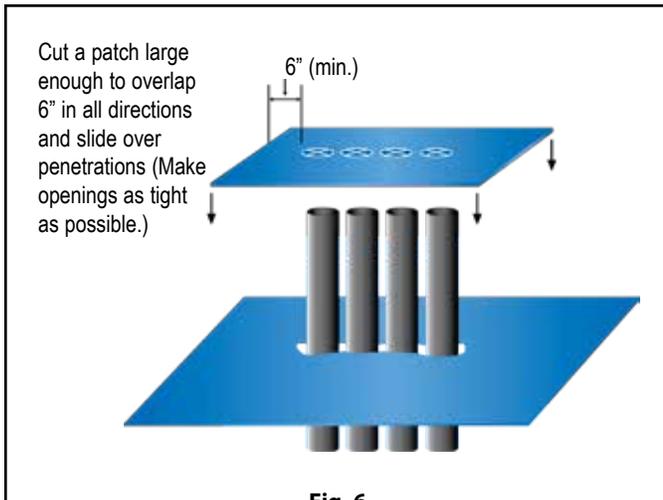


Fig. 6

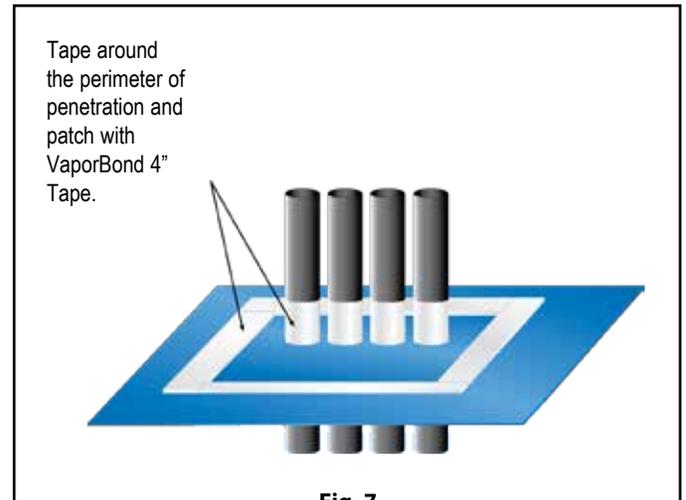


Fig. 7

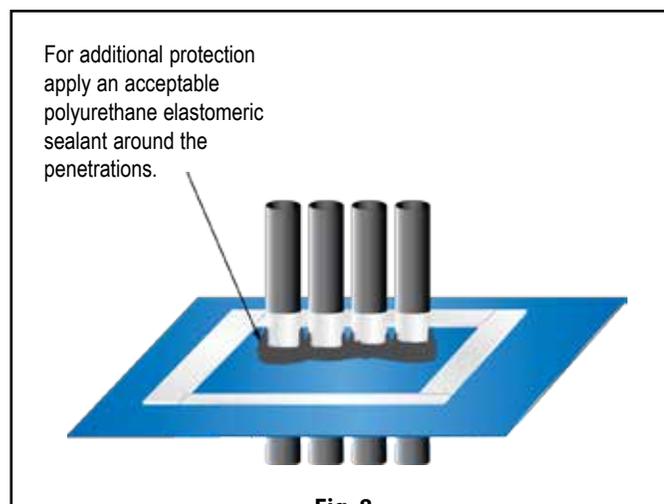


Fig. 8

## VAPORBLOCK® PROTECTION

- 2.1. When installing reinforcing steel and utilities, in addition to the placement of concrete, take precaution to protect **VaporBlock®**. Carelessness during installation can damage the most puncture-resistant membrane. Sheets of plywood cushioned with geotextile fabric temporarily placed on **VaporBlock®** provide for additional protection in high traffic areas including concrete buggies.
- 2.2. Use only brick-type or chair-type reinforcing bar supports to protect **VaporBlock®** from puncture.
- 2.3. Avoid driving stakes through **VaporBlock®**. If this cannot be avoided, each individual hole must be repaired.
- 2.4. If a cushion or blotter layer is required in the design between **VaporBlock®** and the slab, additional care should be given if sharp crushed rock is used. Washed rock will provide less chance of damage during placement. Care must be taken to protect blotter layer from precipitation before concrete is placed.

**VaporBlock®** Vapor Barrier can be identified on site as blue in color printed in black ink with the following logo and classification listing:



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

**RAVEN**  
INDUSTRIES

**Engineered Films Division**  
P.O. Box 5107  
Sioux Falls, SD 57117-5107  
Ph: (605) 335-0174 • Fx: (605) 331-0333

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Toll Free: 800-635-3456  
Email: [efdsales@ravenind.com](mailto:efdsales@ravenind.com)  
[www.ravenefd.com](http://www.ravenefd.com)  
2/14 EFD 1156

# VAPORBLOCK® PLUS™ VBP20

Under-Slab Vapor / Gas Barrier

RAVEN  
INDUSTRIES

## Product Description

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

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

## Product Use

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

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

## Size & Packaging

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



Under-Slab Vapor/Gas Retarder

## Product

## Part #

VaporBlock Plus 20 ..... VBP 20

## APPLICATIONS

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

**VaporBlock® Plus™**  
UNDERSLAB VAPOR RETARDER / GAS BARRIER

		VAPORBLOCK PLUS 20	
PROPERTIES	TEST METHOD	IMPERIAL	METRIC
APPEARANCE		White/Gold	
THICKNESS, NOMINAL		20 mil	0.51 mm
WEIGHT		102 lbs/MSF	498 g/m <sup>2</sup>
CLASSIFICATION	ASTM E 1745	CLASS A, B & C	
TENSILE STRENGTH LBF/IN (N/CM) AVERAGE MD & TD (NEW MATERIAL)	ASTM E 154 Section 9 (D-882)	58 lbf	102 N
IMPACT RESISTANCE	ASTM D 1709	2600 g	
MAXIMUM USE TEMPERATURE		180° F	82° C
MINIMUM USE TEMPERATURE		-70° F	-57° C
PERMEANCE (NEW MATERIAL)	ASTM E 154 Section 7  ASTM E 96 Procedure B	0.0051 Perms grains/(ft <sup>2</sup> ·hr·in·Hg)	0.0034 Perms g/(24hr·m <sup>2</sup> ·mm Hg)
RADON DIFFUSION COEFFICIENT	K124/02/95	< 1.1 x 10 <sup>-13</sup> m <sup>2</sup> /s	
METHANE PERMEANCE	ASTM D 1434	< 1.7 x 10 <sup>-10</sup> m <sup>2</sup> /d·atm 0.32 GTR (Gas Transmission Rate) ml/m <sup>2</sup> ·D·ATM	

### VaporBlock® Plus™ Placement

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



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

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. Chemical resistance as well as other performance criteria is not implied or given and actual testing must be performed for applicability in specific applications and/or conditions. RAVEN INDUSTRIES MAKES NO WARRANTIES 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.



**Engineered Films Division**  
P.O. Box 5107  
Sioux Falls, SD 57117-5107  
Ph: (605) 335-0174 • Fx: (605) 331-0333

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Email: [efdsales@ravenind.com](mailto:efdsales@ravenind.com)  
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