

**64-02& 64-06 QUEENS BOULEVARD**  
**WOODSIDE, QUEENS, NEW YORK**

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**Remedial Action Work Plan**

NYC VCP Project Number **XXCVCPXXXX** (e.g. **15CVCP027X**)  
OER Project Number **15EHAN504Q**

**Prepared For:**

Queens Boulevard Venture, LLC  
35-06 Leavitt Street, Suite CF-A  
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**MAY 2016**

# **REMEDIAL ACTION WORK PLAN**

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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
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	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
VCA	Voluntary Cleanup Agreement
VOC	Volatile Organic Compound



# CERTIFICATION

I, Kevin F. Loyst, PE, 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 64-02 & 64-06 Queens Boulevard site, site number [VCP site number]. I certify to the following:

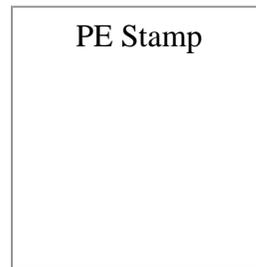
- I have reviewed this document, to which my signature and seal are affixed.
- Engineering Controls developed for this remedial action were designed by me or a person under my direct supervision and designed to achieve the goals established in this Remedial Action Work Plan for this site.
- The Engineering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

\_\_\_\_\_  
Name

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

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date



I, Ben T. Cancemi, am a qualified Environmental Professional. I will have primary direct responsibility for implementation of the remedial program for the 64-02 & 64-06 Queens Boulevard 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**

Queens Boulevard Venture, LLC is working with the NYC Office of Environmental Remediation (OER) in the New York City Voluntary Cleanup Program to investigate and remediate a 16,050-square foot site located at 64-02 & 64-06 Queens Boulevard 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 in the Woodside section of Queens, New York and is identified as Block 2325 and Lot 32 on the New York City Tax Map. Figure 1.1.1 is a Site location map. The Site is 16,050-square feet and is bounded by Queens Boulevard to the north, residential buildings to the south, FDNY Rescue Co. 4 and Engine Co. 292 to the east, and 64th Street to the west. Currently, the Site is vacant and undeveloped. The former 11,000-square-foot one-story commercial building was demolished prior to the RI. Demolition was completed in January 2016 and included the complete removal of the building, underlying concrete slab, associated footings, and the asphalt-paved parking lot. No basement was present. Figure 1.1.2 is a Site plan showing the current layout of the Site.

### **Summary of Redevelopment Plan**

The proposed use of the Site will be commercial and residential. Redevelopment will include the construction of a one- to eight-story building with a cellar and sub-cellar extending to a total depth of 20 feet below grade (fbg).

The layout of the proposed Site development is presented in Figure 1.2.1. The current zoning designation is R7X R4-1 with a C2-3 overlay which permits residential and retail commercial use.

The new building will be approximately 15,915 square feet and the cellar and sub-cellar will occupy the entire lot. An approximately 135 square feet area on the southeast corner of the Site is anticipated to be utilized as an outdoor sitting area at the first floor level and will not be developed above grade.. The sub-cellar will contain parking and mechanical rooms. The cellar will contain hotel rooms, mechanical rooms, a lounge, a meeting room, and a terrace. The first floor (ground level) will contain a hotel lobby, hotel rooms, a buffet area, a pantry area, and mechanical rooms. The second and third floors will contain hotel rooms and mechanical rooms. The fourth floor will contain hotel rooms, residential apartments, and mechanical rooms. Floors five through seven will contain residential apartments and mechanical rooms. The eighth floor will contain residential apartments, mechanical rooms, a recreation area, and a terrace. The building will contain 93 hotel rooms, 42 apartments, and three elevators; the total gross area of the building will be 96,325 square feet.

Development of the cellar and sub-cellar will include excavation across the entire Site to a depth of 24 fbg to allow for construction of foundation elements. Approximately 14,150 cubic yards of soil will be excavated. Depth to groundwater is present at 26 to 28 fbg.

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

### **Summary of Surrounding Property**

The Site is located in a neighborhood with commercial buildings, residential buildings, public facilities and institutions, transportation and utility buildings, open space and recreation areas, and parking areas. The properties in this area are typically zoned R7X with a C2-3 overlay, R4-1, and R5B. The Site is adjoined to the south by residential buildings. The Site is adjoined to the north by a Queens Motor Inn across Queens Boulevard. The Site is adjoined to the west by a residential building with commercial retail space on the first floor across 64<sup>th</sup> Street. The Site is adjoined to the east by the FDNY Rescue Co. 4 and Engine Co. 292. Figure 1.3.1 shows the surrounding land usage.

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

The Site was developed prior to 1914 with railroad tracks on the southwest corner of the property. Between 1914 and 1932 a filling station consisting of a one-story garage, a one-story store building, and three gas tanks was developed on the western portion of the property, with the tanks located beneath the northwestern portion of the property. Between 1932 and 1951 a one-story lumber building was developed to the east of the filling station. The Site was redeveloped with a commercial building and parking lot in 1960. The property is currently owned by Queens Boulevard Ventures, LLC, which has owned the property since February 2015. The property was previously owned by various commercial entities. No industrial ownership is apparent.

The AOCs identified for this site include:

1. The northwest portion of the site where gasoline USTs and pumps were identified in a previous Phase I ESA
2. The presence of chlorinated VOCs in soil vapor was identified during a previous subsurface investigation.

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

The following scope of work was performed as part of the RI:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Conducted a geophysical survey of the Site to investigate for the existence of potential USTs and other subsurface infrastructure;
3. Installed six soil borings across the entire project Site, and collected 12 soil samples for chemical analysis from the soil borings to evaluate soil quality;
4. Installed three groundwater monitoring wells throughout the Site to establish groundwater flow and collected three groundwater samples for chemical analysis to evaluate groundwater quality;
5. Installed five soil vapor probes around Site perimeter and collected five samples for chemical analysis.

## Summary of Findings of Remedial Investigation

1. Elevation of the property is approximately 50 feet above mean sea level.
2. Depth to groundwater ranges from 26.64 to 28.21 feet below grade at the Site.
3. Groundwater flow is generally from northeast to southwest beneath the Site.
4. Depth to bedrock is approximately 200 feet below grade at the Site.
5. The stratigraphy of the site, from the surface down, consists of five to ten feet of historic fill composed of a brown/ medium to fine-grained sand with angular gravel, silt, asphalt, and brick. This layer was underlain by an approximately 11.5 to 15-foot thick layer consisting of a brown/tan medium to fine-grained silty-sand with fine gravel. This layer was underlain by an approximately one to ten-foot thick layer consisting of a brown/tan sandy clay with some fine gravel
6. Soil/fill samples results were compared to New York State Department of Environmental Conservation (NYSDEC) Part 375 Table 375-6.8 Unrestricted Use and Restricted Residential Use Soil Cleanup Objectives (SCOs). Fill samples collected during the RI showed no exceedances for VOCs above the Unrestricted Use Track 1 SCOs, with the exception of acetone (71 ug/kg) in the shallow sample from boring SB-3. The 2014 investigation identified low concentrations of chlorinated solvents including methylene chloride (6.5 ug/kg) and PCE (26 ug/kg) in the area of the former parking lot. Several SVOCs were detected exceeding Restricted Residential Use SCOs in one shallow soil sample and included benzo(a)anthracene (6,300 ug/kg), benzo(a)pyrene (5,100 ug/kg), benzo(b)fluoranthene (6,400 ug/kg), chrysene (6,300 ug/kg), dibenzo(a,h)anthracene (1,300 ug/kg), and indeno(1,2,3-cd)pyrene (4,500 ug/kg). Benzo(k)fluoranthene (2,600 ug/kg) also exceeded the Unrestricted Use SCOs in one of the twelve soil samples collected. The maximum total concentration of SVOCs identified was 76,109 ug/kg. The metals including copper (maximum 66.5 mg/kg), lead (maximum 303 mg/kg), zinc (maximum 282 mg/kg), and/or mercury (0.31 mg/kg) exceeded the Unrestricted Use SCOs in three of the twelve soil samples collected, but did not exceed the Restricted Residential Use SCOs. No pesticides or PCBs were detected in any of the soil samples. Overall, the soil chemistry is unremarkable and does not indicate any disposal.

7. Groundwater samples results were compared to New York State 6NYCRR Part 703.5 Class GA groundwater quality standards (GQS). Groundwater results showed no VOCs and SVOCs above GQSs. Several metals were identified but only magnesium, manganese, and sodium exceeded their GQS in both the unfiltered and dissolved-phase samples. No PCBs or pesticides were detected in any of the groundwater samples. Groundwater use is not contemplated at this Site.
8. Soil vapor samples collected during the RI showed several classes of VOCs consistent with the Site's history and location in an urban area, including low-level petroleum related compounds and variable concentrations of chlorinated solvents. In the 2014 study, PCE was identified at two locations above the NYSDOH 2006 Guidance thresholds for mitigation for sub-slab soil vapor concentrations with a maximum concentration of 330 ug/m<sup>3</sup>. TCE was identified at one location at a concentration of 12 ug/m<sup>3</sup>. In the 2016 study, PCE was detected in three of the five samples at a low level for which the NYSDOH would either require no further action or would require reasonable and practical actions to be undertaken to identify sources and reduce exposures (depending on the indoor air concentration of PCE). Methyl ethyl ketone (2-butanone) was also identified in soil vapor in the 2016 study at concentrations ranging from 640 ug/m<sup>3</sup> to 2,200 ug/m<sup>3</sup>. These results are consistent with the soil and groundwater data from the RI.

## **Summary of the Remedial Action**

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

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.

2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establishment of Unrestricted Use Track 1 SCOs. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of Track 1 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 Unrestricted Use (Track 1) SCOs.  
The entire footprint of the building area (100% of the property) will be excavated to a depth of approximately 24 feet below grade for development purposes. Approximately 14,150 cubic yards of soil/fill will be removed from the Site and properly disposed at an appropriately licensed or permitted facility.
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 all UST's that are encountered during soil/fill removal actions. Registration of tanks and reporting of any petroleum spills associated with UST's and appropriate closure of these petroleum spills in compliance with applicable local, State and Federal laws and regulations.
10. Transportation and off-Site disposal of all soil/fill material at licensed or permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media on-Site.

11. As part of development, construction of an engineered composite cover is anticipated to consist of a six-inch thick concrete slab with a 6-inch granular sub-base beneath the sub-cellar and a 4-inch thick concrete sidewalk with a 6-inch sub-base.
12. As part of development, installation of a vapor barrier system consisting of vapor barrier beneath the building slab and outside of sub-grade foundation sidewalls to mitigate soil vapor migration into the building. The vapor barrier system will consist of a 47-mil Grace Preprufe 300R vapor barrier below the slab throughout the full building area and outside all sub-grade foundation sidewalls. All welds, seams and penetrations will be properly sealed to prevent preferential pathways for vapor migration.
13. As part of new development, construction and operation of a sub-cellar parking garage with high volume air exchange in conformance with NYC Building Code.
14. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
15. 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.
16. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.
17. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and lists any changes from this RAWP.

## 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, shows the location of identified 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: 64-02 & 64-06 Queens Boulevard, Woodside, New York
- NYC Voluntary Cleanup Program Project Number: **XXCVCPXXXX**

### **Project Contacts:**

- OER Project Manager: Colin Sullivan, 212-788-8841
- Site Project Manager: George Xu, 718-939-1060
- Site Safety Officer: TBD **Name, Phone Number**
- Online Document Repository: **link to OER’s document repository**

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

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

**Qualitative Human Health Exposure Assessment:** An important part of the cleanup planning for the Site is 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 this 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 the NYC 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 a link to the document repository where project documents can be viewed.

**Complaint Management:** The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager 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**

Queens Boulevard Venture, LLC 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 64-02 & 64-06 Queens Boulevard in the Woodside 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 in the Woodside section of Queens, New York and is identified as Block 2325 and Lot 32 on the New York City Tax Map. Figure 1.1.1 is a Site location map. The Site is 16,050-square feet and is bounded by Queens Boulevard to the north, residential buildings to the south, FDNY Rescue Co. 4 and Engine Co. 292 to the east, and 64th Street to the west. Currently, the Site is vacant and undeveloped. The former 11,000-square-foot one-story commercial building was demolished prior to the RI. Demolition was completed in January 2016 and included the complete removal of the building, underlying concrete slab, associated footings, and the asphalt-paved parking lot. No basement was present. Figure 1.1.2 is a Site plan showing the current layout of the Site.

## **1.2 Redevelopment Plan**

The proposed use of the Site will be commercial and residential. Redevelopment will include the construction of a one- to eight-story building with a cellar and sub-cellar extending to a total depth of 20 feet below grade (fbg). The layout of the proposed Site development is presented in

Figure 1.2.1. The current zoning designation is R7X R4-1 with a C2-3 overlay which permits residential and retail commercial use.

The new building will be approximately 15,915 square feet and the cellar and sub-cellar will occupy the entire lot. An approximately 135 square feet area on the southeast corner of the Site is anticipated to be utilized as an outdoor sitting area at the first floor level and will not be developed above grade.. The sub-cellar will contain parking and mechanical rooms. The cellar will contain hotel rooms, mechanical rooms, a lounge, a meeting room, and a terrace. The first floor (ground level) will contain a hotel lobby, hotel rooms, a buffet area, a pantry area, and mechanical rooms. The second and third floors will contain hotel rooms and mechanical rooms. The fourth floor will contain hotel rooms, residential apartments, and mechanical rooms. Floors five through seven will contain residential apartments and mechanical rooms. The eighth floor will contain residential apartments, mechanical rooms, a recreation area, and a terrace. The building will contain 93 hotel rooms, 42 apartments, and three elevators; the total gross area of the building will be 96,325 square feet.

Development of the cellar and sub-cellar will include excavation across the entire Site to a depth of 24 fbg to allow for construction of foundation elements. Approximately 14,150 cubic yards of soil will be excavated. Depth to groundwater is present at 26 to 28 fbg.

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

### **1.3 Description of Surrounding Property**

The Site is located in a neighborhood with commercial buildings, residential buildings, public facilities and institutions, transportation and utility buildings, open space and recreation areas, and parking areas. The properties in this area are typically zoned R7X with a C2-3 overlay, R4-1, and R5B. The Site is adjoined to the south by residential buildings. The Site is adjoined to the north by a Queens Motor Inn across Queens Boulevard. The Site is adjoined to the west by a residential building with commercial retail space on the first floor across 64<sup>th</sup> Street. The Site is adjoined to the east by the FDNY Rescue Co. 4 and Engine Co. 292. Figure 1.3.1 shows the surrounding land usage.

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

The Site was developed prior to 1914 with railroad tracks on the southwest corner of the property. Between 1914 and 1932 a filling station consisting of a one-story garage, a one-story store building, and three gas tanks was developed on the western portion of the property, with the tanks located beneath the northwestern portion of the property. Between 1932 and 1951 a one-story lumber building was developed to the east of the filling station. The Site was redeveloped with a commercial building and parking lot in 1960. The property is currently owned by Queens Boulevard Ventures, LLC, which has owned the property since February 2015. The property was previously owned by various commercial entities. No industrial ownership is apparent.

The AOCs identified for this site include:

1. The northwest portion of the site where gasoline USTs and pumps were identified in a previous Phase I ESA
2. The presence of chlorinated VOCs in soil vapor was identified during a previous subsurface investigation.

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

The following scope of work was performed as part of the RI:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Conducted a geophysical survey of the Site to investigate for the existence of potential USTs and other subsurface infrastructure;
3. Installed six soil borings across the entire project Site, and collected 12 soil samples for chemical analysis from the soil borings to evaluate soil quality;
4. Installed three groundwater monitoring wells throughout the Site to establish groundwater flow and collected three groundwater samples for chemical analysis to evaluate groundwater quality;

5. Installed five soil vapor probes around Site perimeter and collected five 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, 64-02 & 64-06 Queens Boulevard”, dated April 2016 (RIR).

1. Elevation of the property is approximately 50 feet above mean sea level.
2. Depth to groundwater ranges from 26.64 to 28.21 feet below grade at the Site.
3. Groundwater flow is generally from northeast to southwest beneath the Site.
4. Depth to bedrock is approximately 200 feet below grade at the Site.
5. The stratigraphy of the site, from the surface down, consists of five to ten feet of historic fill composed of a brown/ medium to fine-grained sand with angular gravel, silt, asphalt, and brick. This layer was underlain by an approximately 11.5 to 15-foot thick layer consisting of a brown/tan medium to fine-grained silty-sand with fine gravel. This layer was underlain by an approximately one to ten-foot thick layer consisting of a brown/tan sandy clay with some fine gravel
6. Soil/fill samples results were compared to New York State Department of Environmental Conservation (NYSDEC) Part 375 Table 375-6.8 Unrestricted Use and Restricted Residential Use Soil Cleanup Objectives (SCOs). Fill samples collected during the RI showed no exceedances for VOCs above the Unrestricted Use Track 1 SCOs, with the exception of acetone (71 ug/kg) in the shallow sample from boring SB-3. The 2014 investigation identified low concentrations of chlorinated solvents including methylene chloride (6.5 ug/kg) and PCE (26 ug/kg) in the area of the former parking lot. Several SVOCs were detected exceeding Restricted Residential Use SCOs in one shallow soil sample and included benzo(a)anthracene (6,300 ug/kg), benzo(a)pyrene (5,100 ug/kg), benzo(b)fluoranthene (6,400 ug/kg), chrysene (6,300 ug/kg), dibenzo(a,h)anthracene (1,300 ug/kg), and indeno(1,2,3-cd)pyrene (4,500 ug/kg). Benzo(k)fluoranthene (2,600 ug/kg) also exceeded the

Unrestricted Use SCOs in one of the twelve soil samples collected. The maximum total concentration of SVOCs identified was 76,109 ug/kg. The metals including copper (maximum 66.5 mg/kg), lead (maximum 303 mg/kg), zinc (maximum 282 mg/kg), and/or mercury (0.31 mg/kg) exceeded the Unrestricted Use SCOs in three of the twelve soil samples collected, but did not exceed the Restricted Residential Use SCOs. No pesticides or PCBs were detected in any of the soil samples. Overall, the soil chemistry is unremarkable and does not indicate any disposal.

7. Groundwater samples results were compared to New York State 6NYCRR Part 703.5 Class GA groundwater quality standards (GQS). Groundwater results showed no VOCs and SVOCs above GQSs. Several metals were identified but only magnesium, manganese, and sodium exceeded their GQS in both the unfiltered and dissolved-phase samples. No PCBs or pesticides were detected in any of the groundwater samples. Groundwater use is not contemplated at this Site.
8. Soil vapor samples collected during the RI showed several classes of VOCs consistent with the Site's history and location in an urban area, including low-level petroleum related compounds and variable concentrations of chlorinated solvents. In the 2014 study, PCE was identified at two locations above the NYSDOH 2006 Guidance thresholds for mitigation for sub-slab soil vapor concentrations with a maximum concentration of 330 ug/m<sup>3</sup>. TCE was identified at one location at a concentration of 12 ug/m<sup>3</sup>. In the 2016 study, PCE was detected in three of the five samples at a low level for which the NYSDOH would either require no further action or would require reasonable and practical actions to be undertaken to identify sources and reduce exposures (depending on the indoor air concentration of PCE). Methyl ethyl ketone (2-butanone) was also identified in soil vapor in the 2016 study at concentrations ranging from 640 ug/m<sup>3</sup> to 2,200 ug/m<sup>3</sup>. These results are consistent with the soil and groundwater data from the RI.

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

## **2.0 Remedial Action Objectives**

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

### **Soil**

- Prevent direct contact with contaminated soil.
- Prevent exposure to contaminants volatilizing from contaminated soil.

### **Groundwater**

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

### **Soil Vapor**

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

### **3.0 Remedial Alternatives Analysis**

The goal of the remedy selection process is to select a remedy that is protective of human health and the environment taking into consideration the current, intended and reasonably anticipated future use of the property. The remedy selection process begins by establishing 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 approximately 10 feet below grade to remove all historic fill. If soil/fill containing analytes at concentrations above Unrestricted Use SCOs is still present at the base of the excavation after removal of all soil required for construction of the new building's cellar level is complete, additional

excavation would be performed to ensure complete removal of soil/ fill that does not meet Track 1 Unrestricted Use SCOs.

- No Engineering or Institutional Controls are required for a Track 1 cleanup, but a vapor barrier/waterproofing system would be installed beneath the building foundation and behind the foundation sidewalls of the new buildings as part of development to prevent any potential future exposures from off-Site soil vapor.
- Placement of a composite cover consisting of a concrete building slab over the entire site.
- As part of new development, construction of a ventilated parking garage in accordance with NYC Building and Mechanical Code requirements, and any applicable indoor air quality standards.

**Alternative 2:**

- Removal of all soil/fill exceeding Track 2 Restricted Residential SCO's, as defined in NYSDEC 6NYCRR Part 375-6.8, and confirmation that Track 2 Restricted Residential SCOs have been achieved with post-excavation endpoint sampling. Based on the results of the Remedial Investigation, it is expected that SCO's would be achieved by excavating for construction of the new building's sub-cellar level to a depth of approximately 24 feet across the entire site. If soil/fill containing analytes at concentrations above Track 2 SCOs is still present at the base of the excavation, additional excavation, as feasible, would be performed to meet Track 2 SCOs.
- Placement of a composite cover system over the entire Site to prevent exposure to remaining soil/fill;
- Installation of a vapor barrier/waterproofing system beneath the building slab and along foundation side walls to prevent potential exposures from soil vapor;
- Installation of sub-grade ventilated parking;
- 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. 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 SCO's, 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. Implementing Institutional Controls including a Site Management Plan and continuing the E-designation instituting a deed notice 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 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. 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 foundation walls below grade.

### **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 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, as part of development. In addition, the sub-cellar of the building will contain a parking garage with high volume air exchange that conforms to the NYC Building Code.

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. 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. A Site Management Plan would ensure that these controls remained protective for the long term. In addition, the sub-cellar of the building will contain a parking garage with high volume air exchange that conforms to the NYC Building Code and will mediate any potential accumulation of soil vapors inside the building.

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.

Alternative 2 would provide long-term effectiveness by removing most on-Site contamination and attaining Track 2 Restricted Residential SCOs; installing a composite cover system across the Site; maintaining use restrictions; establishing an SMP to ensure long-term management of ICs and ECs; and maintaining registration as an E-designated property to memorialize these controls for the long term. The SMP would ensure long-term effectiveness of all ECs and ICs by requiring periodic inspection and certification that these controls and restrictions continue to be in place and are functioning as they were intended, assuring that protections designed into the remedy continue to 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.

Alternative 1 would remove a greater total mass of contaminants from the Site. The removal of soil to 24 feet 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 found to extend to a depth of up to 10 feet below grade during the RI, and the new building requires excavation of the entire Site to a depth of 24 feet, the costs associated with both Alternative 1 and Alternative 2 will likely be comparable. 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 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 an eight story affordable and supportive housing project to provide 42 dwelling units and 93 hotel rooms. Following remediation, the Site will meet either Track 1 Unrestricted Use or Track 2 Restricted Residential SCOs, both of which are protective of public health and the environment for its planned residential use. The proposed use is compliant with the property's zoning and is consistent with recent development patterns. The areas surrounding the site is urban and consists of predominantly mixed residential and commercial buildings, public facilities and institutions, transportation and utility buildings, and open space and recreation areas in zoning districts designated for commercial and residential uses. The development would remediate a vacant contaminated lot and provide a modern residential and commercial building. The proposed development would clean up the property and make it safer, create new employment opportunities, living space for affordable and supportive housing and associated societal benefits to the community, and other economic benefits from land revitalization.

Temporary short-term project impacts are being mitigated through site management controls and truck traffic controls during remediation activities. Following remediation, the Site will meet either Track 1 Unrestricted Use SCOs or Track 2 Restricted Residential SCOs, both of which are protective of public health and the environmental for its planned use.

The Site is not in close proximity to important cultural resources, including federal or state historic or heritage sites or Native American religious sites, natural resources, waterways, wildlife refuges, wetlands, or critical habitats of endangered or threatened species. The Site is located in an urban area and not in proximity to fish or wildlife and neither alternative would result in any potential exposure pathways of contaminant migration affecting fish or wildlife.

The remedial action is also protective of groundwater natural resources. The Site does not lie in a Federal Emergency Management Agency (FEMA)-designated flood plain. Both alternatives are equally protective of natural resources and cultural resources. Improvements in the current environmental condition of the property achieved by both alternatives considered in this plan are consistent with the City's goals for cleanup of contaminated land.

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

This criterion evaluates the overall sustainability of the remedial action alternatives and the degree to which sustainable means are employed to implement the remedial action including those that take into consideration NYC's sustainability goals defined in PlanNYC: 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 1, the Track 1 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 standard methods that are well established in the industry.

The proposed remedial action will consist of:

1. Preparation of a Community Protection Statement and performance of all required NYC VCP Citizen Participation activities according to an approved Citizen Participation Plan.
2. Performance of a Community Air Monitoring Program for particulates and volatile organic carbon compounds.
3. Establishment of Unrestricted Use Track 1 SCOs. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of Track 1 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 Unrestricted Use (Track 1) SCOs.

The entire footprint of the building area (100% of the property) will be excavated to a depth of approximately 24 feet below grade for development purposes. Approximately 14,150 cubic yards of soil/fill will be removed from the Site and properly disposed at an appropriately licensed or permitted facility.

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 all UST's that are encountered during soil/fill removal actions. Registration of tanks and reporting of any petroleum spills associated with UST's and appropriate closure of these petroleum spills in compliance with applicable local, State and Federal laws and regulations
10. Transportation and off-Site disposal of all soil/fill material at licensed or permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities. Appropriate segregation of excavated media on-Site.
11. As part of development, construction of an engineered composite cover is anticipated to consist of a six-inch thick concrete slab with a 6-inch granular sub-base beneath the sub-cellar and a 4-inch thick concrete sidewalk with a 6-inch sub-base.
12. As part of development, installation of a vapor barrier system consisting of vapor barrier beneath the building slab and outside of sub-grade foundation sidewalls to mitigate soil vapor migration into the building. The vapor barrier system will consist of a 47-mil Grace Preprufe 300R vapor barrier below the slab throughout the full building area and outside all sub-grade foundation sidewalls. All welds, seams and penetrations will be properly sealed to prevent preferential pathways for vapor migration.
13. As part of new development, construction and operation of a sub-cellar parking garage with high volume air exchange in conformance with NYC Building Code.
14. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations.
15. 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.
16. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations.

17. Submission of a Remedial Action Report (RAR) that describes the remedial activities, certifies that the remedial requirements have been achieved, defines the Site boundaries, and lists any changes from this RAWP.

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

Track 1 SCOs are proposed for this project and SCO's are defined in 6 NYCRR Part 375, Table 6.8(a) Track 1 Unrestricted Use. If Track 1 SCO's are not achieved, then Track 2 Restricted Residential SCO's will be utilized, as defined in 6 NYCRR Part 375, Table 6.8 Track 2 Restricted Residential Use.

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**

The entire Site will be excavated to a depth of approximately 24 feet below grade for development purposes. The total quantity of soil/fill expected to be excavated and disposed off-Site is 14,150 cubic yards. For each disposal facility to be used in the remedial action, a letter from the developer/QEP to the receiving facility requesting approval for disposal and a letter back to the developer/QEP providing approval for disposal will be submitted to OER prior to any transport and disposal of soil at a facility. Disposal facilities will be reported to OER when they are identified and prior to the start of remedial action.

### **End-point Sampling**

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

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

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

### **Confirmation End-point Sampling**

Removal actions for development purposes under this plan will be performed in conjunction with confirmation end-point soil sampling. Four confirmation samples will be collected from the base of the excavation at locations to be determined by OER. To evaluate attainment of Track 1 SCOs, analytes will include those for which SCOs have been developed, including VOCs, SVOCs, metals, pesticides, and PCBs according to analytical methods described above.

### **Hotspot End-point Sampling**

End-point samples will be collected from the sidewalls and base of excavation at the one hotspot locations identified in the Remedial Investigation, according to the procedure listed below. Hotspots include soil boring SB-1 for SVOCs. End-point samples will be analyzed for SCO trigger parameters.

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

1. For excavations less than 20 feet in total perimeter, at least one bottom sample and one sidewall sample biased in the direction of surface runoff.
2. For excavations 20 to 300 feet in perimeter:
  - For surface removals, one sample from the top of each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.
  - For subsurface removals, one sample from each sidewall for every 30 linear feet of sidewall and one sample from the excavation bottom for every 900 square feet of bottom area.

3. For sampling of volatile organics, bottom samples should be taken within 24 hours of excavation, and should be taken from the zero to six-inch interval at the excavation floor. Samples taken after 24 hours should be taken at six to twelve inches.
4. For contaminated soil removal, post remediation soil samples for laboratory analysis should be taken immediately after contaminated soil removal. If the excavation is enlarged horizontally, additional soil samples will be taken pursuant to bullets 1-3 above.

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

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

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

QA/QC procedures will be used to provide performance information with regard to accuracy, precision, sensitivity, representation, completeness, and comparability associated with the sampling and analysis for this investigation. Field QA/QC procedures will be used (1) to document that samples are representative of actual conditions at the Site and (2) identify possible cross-contamination from field activities or sample transit. Laboratory QA/QC procedures and analyses will be used to demonstrate whether analytical results have been biased either by interfering compounds in the sample matrix, or by laboratory techniques that may have introduced systematic or random errors to the analytical process. A summary of the field and laboratory QA/QC procedures is provided below.

Field QA/QC will include the following procedures:

- Calibration of field equipment, including PID, on a daily basis;

- Analysis of duplicate samples;
- Use of dedicated and/or disposable field sampling equipment;
- Proper sample handling and preservation;
- Proper sample chain of custody documentation; and
- Completion of report logs.

The above procedures will be executed as follows:

- Disposable sampling equipment including nitrile gloves will be used to minimize cross-contamination between samples;
- For each of the parameters analyzed, a sufficient sample volume will be collected to adhere to the specific analytical protocol, and provide sufficient sample for reanalysis if necessary;
- Appropriate sample preservation techniques, including cold temperature storage at 4° C, will be utilized to ensure that the analytical parameter concentrations do not change between the time of sample collection and analysis; and

Samples will be analyzed prior to the expiration of the respective holding time for each analytical parameter to ensure the integrity of the analytical results.

### **Import of Soils**

Soil import is not planned on this project.

### **Reuse of Onsite Soils**

Soil reuse is not planned on this project.

## **4.3 Engineering Controls**

The remedial action will achieve Track 1 Unrestricted Use SCOs and no Engineering Controls are required. However, the following design elements will be incorporated into the project as part of the development:

- (1) Composite Cover System
- (2) Soil Vapor Barrier System
- (3) Sub-grade ventilated garage

If Track 1 is not achieved, these elements will constitute Engineering Controls that will be employed in the remedial action to address residual contamination remaining at the Site.

### **Composite Cover System**

Exposure to residual soil/fill will be prevented by an engineered, composite cover system to be built on the Site. This composite cover system will be anticipated to consist of a six-inch thick concrete slab with a 6-inch granular sub-base beneath the sub-cellar and a 4-inch thick concrete sidewalk with a 6-inch sub-base.

An engineering diagram showing a cross section design on the composite cover system is included in Appendix 6.

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 consist of a 47-mil Grace Preprufe 300R vapor barrier. All welds, seams and penetrations will be properly sealed to prevent preferential pathways for vapor migration. 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.

Product specification sheets and drawings are provided in Appendix 6. The Remedial Action Report will include as-built drawings and diagrams; manufacturer documentation; and photographs.

#### **4.4 Institutional Controls**

A Track 1 remedial action is proposed and Institutional Controls are not required. If a Track 1 remedial action is not achieved, Institutional Controls (IC's) will be incorporated in this remedial action to manage residual soil/fill and other media and render the Site protective of public health and the environment. 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 residential and commercial use and will not be used for a higher level of use without prior approval by OER.

## **4.5 Site Management Plan**

A Track 1 remedial action is proposed and Site Management is not required. If a Track 1 remedial action is not achieved, Site Management will be required and will be the last phase of remediation. Site Management will begin 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:**

- The SVOCs benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene exceeded the Track 2 Restricted Residential SCOs.
- No VOCs or metals exceeded their respective Track 2 Restricted Residential SCOs.
- No pesticides or PCBs were detected in the samples collected for the RI.

### **Groundwater:**

- Several metals were identified, but only magnesium, manganese, and sodium exceeded their respective GQs.
- No VOCs or SVOCs exceeded their respective GQs in the samples collected for the RI.
- No pesticides or PCBs were detected in the samples collected for the RI.

### **Soil Vapor:**

- In a 2014 study, PCE was identified at two locations above the NYSDOH 2006 Guidance thresholds for mitigation for sub-slab soil vapor concentrations with a maximum concentration of 330 ug/m<sup>3</sup>. TCE was also identified at one location at a concentration of 12 ug/m<sup>3</sup>. In the RI, PCE was detected at a low level for which the NYSDOH would either require no further action or would require reasonable and practical actions to be undertaken to identify sources and reduce exposures (depending on the indoor air concentration of PCE). TCE was not detected in the samples collected for the RI.
- Methyl ethyl ketone (2-butanone) was identified at concentrations ranging from 640 ug/m<sup>3</sup> to 2,200 ug/m<sup>3</sup>

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

The SVOC exceedances in the soil are generally minor and are not suggestive of an onsite source. This observation is consistent with the visual, olfactory, and PID observations of the soil borings, none of which suggested an onsite source. The metals detected in groundwater were generally evenly spaced across the Site and their distribution does not suggest an onsite source. These detections do not present a particular concern as magnesium and manganese are often elevated in NYC groundwater and sodium is often elevated due to recharge of stormwater runoff containing road deicing materials. PCE and TCE were found in soil vapor slightly exceeding NYSDOH guidance matrix for monitoring in a 2014 study. In the samples collected for the 2016 RI, PCE was found at low levels for which the NYSDOH would not require monitoring or mitigation, and TCE was not detected. Methyl ethyl ketone (2-butanone) was detected at slightly elevated concentration, but was not detected in the soil or groundwater samples. The soil vapor sampling results are not suggestive of an onsite source of VOCs.

## **Receptor Populations**

**On-Site Receptors:** The site is currently vacant and undeveloped and 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 undeveloped and vacant and there are potential exposure pathways from ingestion, inhalation, or dermal absorption of soil/ fill. However, access to the site is restricted. 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 1 SCOs will be removed. The site will be fully capped, preventing potential direct exposure to soil and groundwater remaining in place, and design elements (composite cover, vapor barrier, and a sub-grade ventilated garage) 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 potential complete exposure pathways for the current site condition. There are potential complete exposure pathways that require mitigation during implementation of the remedy. There are no complete exposure pathways under future conditions after the site is developed. This assessment takes into consideration the reasonably anticipated use of the site, which includes a mixed-use residential and commercial structure with a sub-grade ventilated garage, site-wide surface cover, and a subsurface vapor barrier system for the building. Under current conditions, on-Site exposure pathways exist for those with access to the Site and trespassers. During remedial construction, on-Site and off-Site exposures to contaminated dust from historic fill material will be addressed through dust controls, and through the implementation of the Community Air Monitoring Program, the Soil/Materials Management Plan, and a Construction Health and Safety Plan. Potential post-construction use of groundwater is not considered an option because groundwater in this area of New York City is not used as a potable water source. There are no surface waters in close proximity to the Site that could be impacted or threatened.

<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 is not direct contact because all soils in excess of Track 1 SCO's will be removed from the site</li> </ul>
Ingestion of groundwater	<ul style="list-style-type: none"> <li>• The area is served by an upstate water supply and 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>• All soils in excess of Track 1 SCO's and Groundwater Protection Standards will be removed from the site.</li> </ul>

	Groundwater is not impacted by site conditions.
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 a high volume air exchange required by the Building Code for ventilation of the sub-grade parking garage.</li> </ul>

## **5.0 Remedial Action Management**

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

Principal personnel who will participate in the remedial action include the Professional Engineer (PE) Kevin Loyst and Qualified Environmental Professionals (QEP) Ben Cancemi.

### **5.2 Site Security**

Site access will be controlled by gated entrances to the fenced 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 John Bukoski. 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 to head east on Queens Boulevard to the Long Island Expressway.

## **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

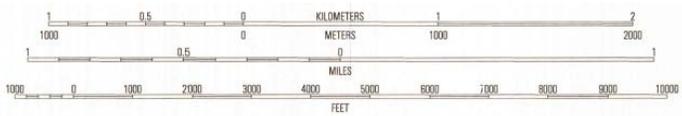
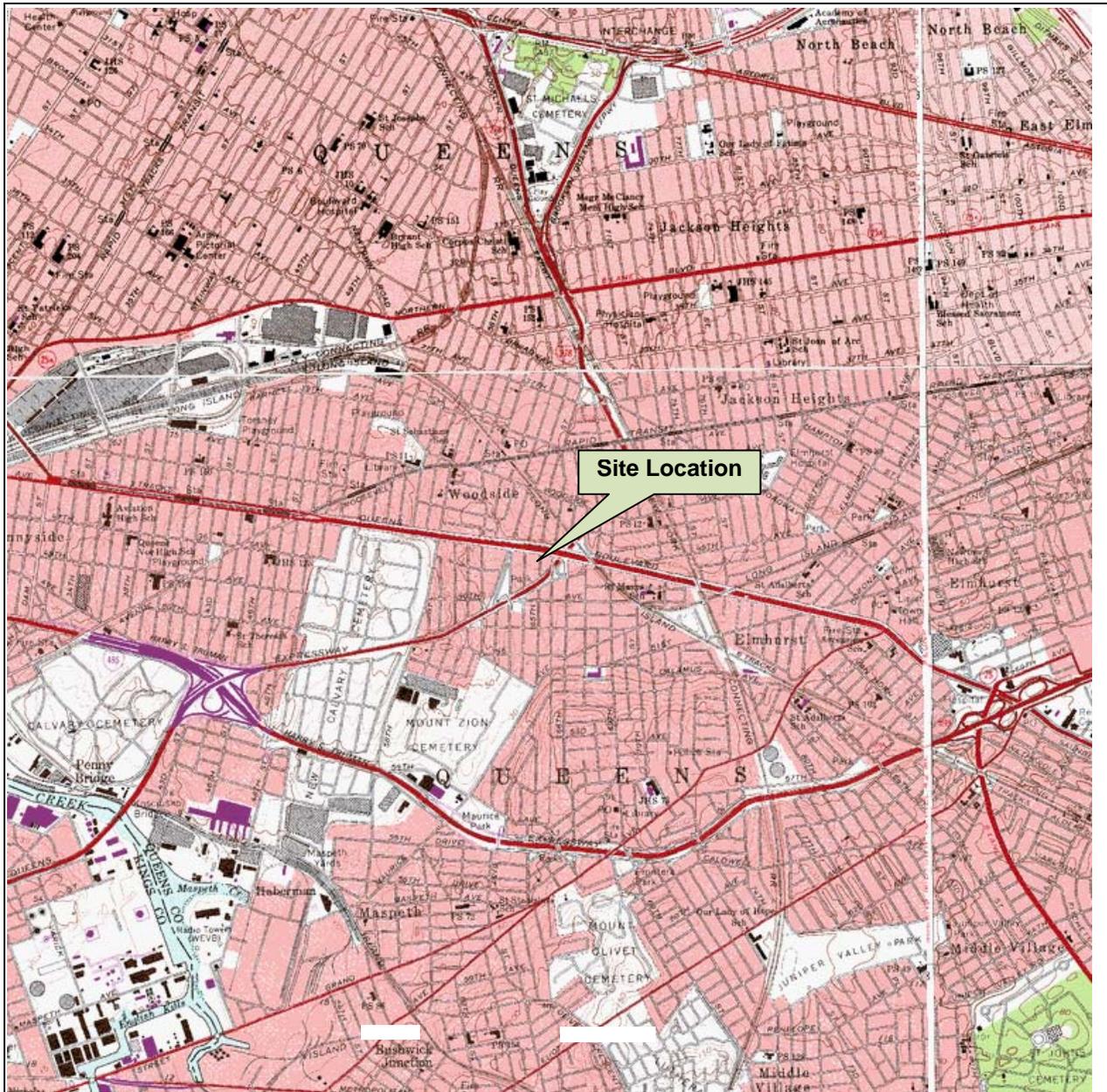
QEP Signature

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 five month remediation period is anticipated.

<b>Schedule Milestone</b>	<b>Weeks from Remedial Action Start</b>	<b>Duration (weeks)</b>
OER Approval of RAWP	0	-
Fact Sheet 2 announcing start of remedy	2	-
Mobilization	2	2
Remedial Excavation	14	12
Demobilization	16	2
Submit Remedial Action Report	20	4



Source: US Geological Survey 7.5-Minute Brooklyn, NY Quadrangle

<b>FPM GROUP</b>		
<b>FIGURE 1.1.1</b>		
<b>SITE LOCATION MAP</b>		
<b>64-02 AND 64-06 QUEENS BOULEVARD</b>		
<b>WOODSIDE, NEW YORK</b>		
Drawn by: GH	Checked By: GH	Date: 5/4/2015

QUEENS BOULEVARD

FORMER ONE-STORY  
COMMERCIAL BUILDING

64th STREET

SUBJECT  
PROPERTY  
BOUNDARY

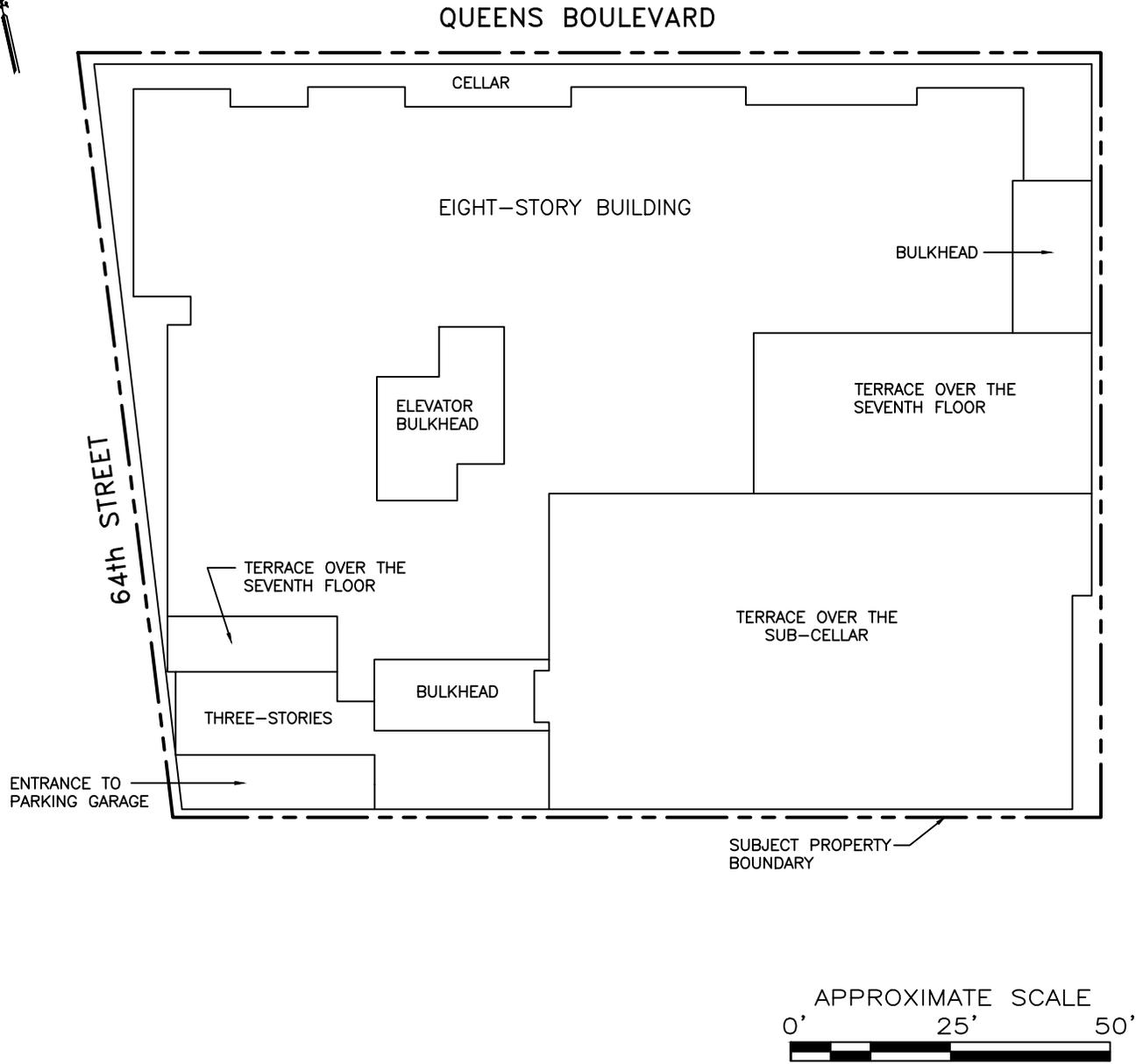
NOT TO SCALE

FPM GROUP

FIGURE 1.1.2  
SITE PLAN

64-02 & 64-06 QUEENS BOULEVARD  
WOODSIDE, NEW YORK

Drawn By: H.C. | Checked By: G.H. | Date: 4/20/15



<b>FPM GROUP</b>		
<b>FIGURE 1.2.1</b> <b>FUTURE DEVELOPMENT PLAN</b> 64-02 & 64-06 QUEENS WOODSIDE, NEW YORK		
Drawn By:H.C.	Checked By:G.H.	Date:6/17/15



Source: Google Earth

<b>FPM GROUP</b>		
<b>FIGURE 1.3.1</b> <b>SURROUNDING LAND USAGE</b> <b>64-02 &amp; 64-06 QUEENS BOULEVARD</b> <b>WOODSIDE, NEW YORK</b>		
Drawn by: GH	Checked By: BC	Date: 4/6/2016

## **APPENDIX 1**

### **PROPOSED DEVELOPMENT PLANS**

## BUILDING INFORMATION

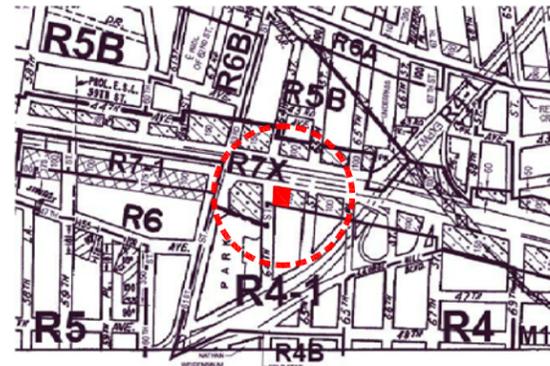
ADDRESS: 64-06 QUEENS BLVD.  
WOODSIDE, NY  
BLOCK: 2325  
LOT: 26, 30 & 32  
C.B.: ---  
ZONE: C2-3/R7X & R4-1  
MAP#: 9d  
U.G.: 2A (QUALITY HOUSING)  
5A (TRANSIENT HOTEL)  
O.G.: R2 (APARTMENT HOTEL)  
R1 (TRANSIENT HOTEL)  
C.C.: IB (PROPOSED)

## SYMBOL LEGEND

KEYNOTE INDICATION	N.Y.C. APPROVED RECESSED 3 HEADS EMERGENCY LIGHT	ELEV./SECT. NUMBER
REVISION INDICATION	N.Y.C. APPROVED RECESSED 2 HEADS EMERGENCY LIGHT	ELEV. NUMBER
FPSC FIRE PROOF SELF CLOSING MIN. 60" MINUTES	OFFICE ROOM NAME	DETAIL NUMBER
N.Y.C. APPROVED COMBINATION SMOKE & CARBON MONOXIDE DETECTOR	ROOM NUMBER	DRAWING NUMBER
N.Y.C. APPROVED EXIT SIGN	DOOR NUMBER	ENLARGE AREA
N.Y.C. APPROVED DIRECTIONAL EXIT SIGN	WINDOW NUMBER	T.O. SLAB ELEV. [+0'-0"]
	PARTITION TYPE	

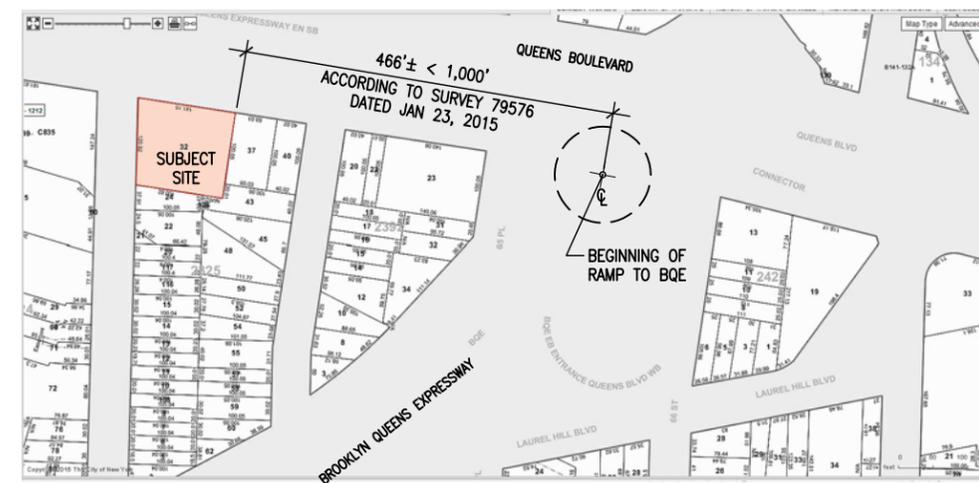
## ABBREVIATION

A.F.F. ABOVE FINISHED FLOOR	GWB. GYPSUM WALLBOARD	R.D. ROOF DRAIN
A.D. ACCESS DOOR	GYP. BD. GYPSUM BOARD	REF. REFERENCE
ALUM. ALUMINUM	H.M. HOLLOW METAL	REINF. REINFORCEMENT
ARCH. ARCHITECTURAL	HORIZ. HORIZONTAL	REQ'D REQUIRED
AT AT	H.P. HIGH POINT	RM. ROOM
B.O. BOTTOM OF	HR. HOUR	SECT. SECTION
BLDG. BUILDING	HT. HEIGHT	SF. SQUARE FEET
CL. CLOSET	H.V.A.C. HEATING, VENTILATING, AIR CONDITIONING	SI. SQUARE INCH
CL. CENTER LINE	I.D. INSIDE DIAMETER	S.O. SIMILAR
CLG. CEILING	I.G.U. INSULATED GLASS UNIT	S.O. SLAB OPENING
COL. COLUMN	INSUL. INSULATION	SPEC. SPECIFICATIONS
CONC. CONCRETE	JT. JOINT	ST.STL. STAINLESS STEEL
CONT. CONTINUOUS	KIT. KITCHEN	STL. STEEL
C.W. CURTAIN WALL	LAM. LAMINATED	STOR. STORAGE
DTL. DETAIL	LAV. LAVATORY	STRUCT. STRUCTURAL
DIA. DIAMETER	L.P. LOW POINT	T. TREADS
DIM. DIMENSION	MAX. MAXIMUM	T.O. TOP OF
DN. DOWN	MECH. MECHANICAL	T.O.S. TOP OF SLAB
DWG. DRAWING	MEZZ. MEZZANINE	TEL. TELEPHONE
D.U. DWELLING UNIT	MTL. METAL	TEMP. TEMPORARY
EL. ELEVATION	M.H. MANHOLE	THK. THICKNESS
ELEC. ELECTRIC	MIN. MINIMUM	TYP. TYPICAL
ELEV. ELEVATOR	MISC. MISCELLANEOUS	U.G. USE GROUP
E.M.R. ELEVATOR MACHINE ROOM	M.O. MASONRY OPENING	U.O.N. UNLESS OTHERWISE NOTED
ENCL. ENCLOSURE	N.I.C. NOT IN CONTRACT	VERT. VERTICAL
E.O.S. EDGE OF SLAB	O.A.I. OUTSIDE AIR INTAKE	VEST. VESTIBULE
EQUIP. EQUIPMENT	O.C. ON CENTER	W/ WITH
EXP. JT. EXPANSION JOINT	OCC. OCCUPANT	W/D WASHER AND DRYER
EXT. EXTERIOR	O.D. OUTSIDE DIAMETER	WD. WOOD
F.D. FLOOR DRAIN	O.P.N'G. OCCUPANCY GROUP OPENING	W.P. WATERPROOFING
F.E.C. FIRE EXTINGUISHER CABINET	P.E. PASSENGER ELEVATOR	W.R. WATER RESISTANT
FIN. FL. FINISHED FLOOR	P.L. PROPERTY LINE	
FL. FLOOR	PL. LAM. PLASTIC LAMINATE	
F.P. FIREPROOFING	PTD. PAINTED	
FPSC FIREPROOF SELF CLOSING	R.C.P. REFLECTED CEILING PLAN	
GA. GAUGE		
GL. GLASS		



## ZONING BOUNDARY MAP NOT TO SCALE

SPECIAL INSPECTIONS	
FIRESTOP	BC 1704.25
SEPARATE APPLICATION	
SHEETING, SHORING AND UNDERPINNING	#
STRUCTURE	#
FIRE ALARM	#
FIRE PROTECTION PLAN	#
EMERGENCY GENERATOR	#
FIRE SAFETY	#
BUILDER'S PAVEMENT PLAN	#
SITE CONNECTION	#



## VICINITY MAP NOT TO SCALE

**ZR 32-14:**  
IN A C2-1, C2-2, C2-3 OR C2-4 DISTRICT, EACH TRANSIENT HOTEL SHALL BE LOCATED ON A ZONING LOT IN WHOLE OR IN PART WITHIN A 1,000 FOOT RADIUS OF THE ENTRANCE OR EXIT OF A LIMITED-ACCESS EXPRESSWAY, FREEWAY, PARKWAY, OR HIGHWAY, ALL OF WHICH PROHIBIT DIRECT VEHICULAR ACCESS TO ABUTTING LAND AND PROVIDE COMPLETE SEPARATION OF CONFLICTING TRAFFIC FLOWS, MEASURED FROM THE CENTERLINE OF THE ENTRANCE OR EXIT RAMP AT ITS INTERSECTION WITH THE NEAREST ADJACENT STREET.

## MATERIAL & WALL CONSTRUCTION LEGEND

	CAST IN PLACE CONCRETE WALL; SEE STRUCTURAL DRAWINGS FOR THICKNESS AND REINFORCING INFORMATION.		ALUM. COMPOSITE PANEL EXTERIOR WALL CONSTRUCTION; 2" ALUM. COMPOSITE PANEL W/2" RIGID INSULATION ON 6" CMU WALL;
	(2) HR FIRE RATED 8" NON-BEARING CMU WALL CONSTRUCTION; SEE STRUCTURAL DRAWINGS FOR REINFORCING INFORMATION. INTERIOR SIDE W/ 1 1/2" METAL STUD, 1 1/2" SEMI-RIGID INSULATION AND 5/8" GYPSUM WALL BOARD FURRING PARTITION.		
	(2) HR FIRE RATED 6" NON-BEARING CMU WALL CONSTRUCTION; SEE STRUCTURAL DRAWINGS FOR REINFORCING INFORMATION.		
	(2) HR FIRE RATED & ACOUSTICAL PARTITION; (2) LAYERS OF 5/8" TYPE "X" GYPSUM WALL BOARDS ON BOTH SIDES OF 3 5/8" 20 G.A. METAL STUD @ MAX. 16" O.C.; RUN STUDS AND BOARDS FULL HEIGHT TO UNDERSIDE OF SLAB WITH 3 1/2" SEMI-RIGID THERMAFIBER INSULATION; CAULK ALL PERIMETER WITH ACOUSTICAL SEALANT; MIN. STC=50; BSA# 310-60-SM.		
	(2) HR FIRE RATED SHAFT WALL CONSTRUCTION; (2) LAYERS 5/8" TYPE "X" GYPSUM WALL BOARDS AT FINISH SIDE, 2 1/2" 20 G.A. C-H METAL STUDS AT 24" O.C., AND 1" GYPSUM LINER AT SHAFT SIDE; RUN STUDS AND BOARDS FULL HEIGHT TO UNDERSIDE OF SLAB WITH 2 1/2" SEMI-RIGID THERMAFIBER INSULATION; CAULK ALL PERIMETER; STC=48; BSA# 354-76-M.		
	(1) HR RATED PARTITION; (1) LAYER OF 5/8" TYPE "X" GYPSUM WALL BOARD ON BOTH SIDES OF 3 5/8" 20 G.A. METAL STUD @ MAX. 16" O.C.; RUN STUDS AND BOARDS FULL HEIGHT TO UNDERSIDE OF SLAB WITH 3 1/2" SEMI-RIGID THERMAFIBER INSULATION; BRACED FURRING STUDS 48" O.C. VERTICALLY; CAULK ALL PERIMETER.		
	ALUM. COMPOSITE PANEL EXTERIOR WALL CONSTRUCTION; 2" ALUM. COMPOSITE PANEL W/2" RIGID INSULATION ON 6" CMU WALL; INTERIOR SIDE W/ 1 1/2" METAL STUD, 1 1/2" SEMI-RIGID INSULATION AND 5/8" GYPSUM WALL BOARD FURRING PARTITION.		

"TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGMENT, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE ENERGY CONSERVATION CONSTRUCTION CODE OF NYCECC-2014-CHAPTER C4."  
THIS APPLICATION COMPLIES WITH LOCAL LAW 17/95 (THE EARTHQUAKE CODE).



PROJECT:  
**HOLIDAY INN EXPRESS**  
64-06 QUEENS BLVD,  
WOODSIDE, NY  
DRAWING TITLE:

### ZONING ANALYSIS

STRUCTURAL ENGINEER:  
**TIMES BUILDINGS PC**  
ENGINEERING SERVICES  
8534 GRAND AVE. 2nd FL. ELMHURST, NY 11373  
TEL: (718) 502-9631 FAX: (718) 228-7348  
WEB: WWW.TBES.US EMAIL: INFO@TBES.US

MEP ENGINEER:  
EJC ENGINEERING, PLLC  
Mechanical/Plumbing/Electrical Engineer  
136-21 ROOSEVELT AVE, FLUSHING, NY 11354  
Tel: (718) 353-8010; ejceng@verizon.net



136-40 39TH AVENUE FLUSHING, NY 11354  
Tel: (718) 445-2345 Fax: (718) 359-8809  
Email: info@raymondchanarchitect.com  
Web: www.raymondchanarchitect.com  
DATE: 03/23/15 DWG. No.:  
PROJ. No.: 21415  
PROJ. MGR: PCA  
DRAWN BY: **A-001.00**  
CADD FILE No.: 21415-DOB OF -

**421163396**  
DEPARTMENT OF BUILDINGS

**ZONING:**

ADDRESS: 64-06 QUEENS BLVD.  
WOODSIDE, NY  
BLOCK: 2325  
LOT: 26, 30 & 32  
C.B.: --  
ZONE: C2-3/R7X & R4-1  
MAP#: 9d  
U.G.: 2A (QUALITY HOUSING)  
5A (TRANSIENT HOTEL)  
O.G.: R2 (APARTMENT HOTEL)  
R1 (TRANSIENT HOTEL)  
C.C.: IB (PROPOSED)

LOT SIZE:  
16,050.2 SF OF WHICH  
C2-3/R7X DISTRICT: 13,493 SF (84.1%)  
R4-1 DISTRICT: 2,557.2 SF (15.9%)  
ENTIRE LOT CLASSIFIES AS C2-3/R7X PER ZR 77-11

**USE REGULATIONS:**

22-12/32-15  
USE GROUP 2 PERMITTED AS-OFF-RIGHT  
USE GROUP 4 PERMITTED AS-OFF-RIGHT

**BULK REGULATIONS - IN INCLUSIONARY HOUSING DESIGNATED AREAS:**

SPECIAL PROVISIONS FOR ZONING LOTS DIVIDED BY DISTRICT BOUNDARIES 77-11  
THE USE REGULATIONS APPLICABLE TO THE DISTRICT IN WHICH MORE THAN 50% OF THE LOT AREA OF THE ZONING LOT IS LOCATED MAY APPLY TO THE ENTIRE ZONING LOT, PROVIDED THAT THE DISTANCE DO NOT EXCEED 25 FEET.  
WHENEVER THE USE REGULATIONS ARE SO APPLIED, THE DISTRICT BOUNDARY MAY BE ASSUMED TO BE RELOCATED ACCORDINGLY, AND THE BULK, OFF-STREET PARKING AND LOADING, AND ALL OTHER REGULATIONS APPLYING TO SUCH EXPANDED DISTRICT SHALL APPLY TO THE ENTIRE ZONING LOT.

MAX. LOT COVERAGE 23-145  
MAXIMUM LOT COVERAGE IN R7X (CORNER LOT) = 80%  
MAX. PERMITTED LOT COVERAGE = 10,077 x 80% = 8,061.6 SF  
PROPOSED LOT COVERAGE = 6553 / 10,077 = 65% < 80% o.k.

MAXIMUM LOT COVERAGE IN R7X (INTERIOR LOT) = 70%  
MAX. PERMITTED LOT COVERAGE = 5,973.2 x 70% = 4,181.24 SF  
PROPOSED LOT COVERAGE = 1872 / 5973.2 = 31.3% < 70% o.k.

23-942 MAX FLOOR AREA  
MAX. FLOOR AREA RATIO FOR Q.H. = 3.75  
MAX. PERMITTED FLOOR AREA = 16,050.2 x 3.75 = 60,188.25 SF  
PROPOSED FLOOR AREA = 28,382 SF < 60,188.25 SF o.k.  
PROPOSED FAR = 1.77 < 3.75 o.k.

33-121  
MAX. FLOOR AREA RATIO FOR COMMERCIAL = 2.0  
MAX. PERMITTED FLOOR AREA = 32,100.4 SF  
PROPOSED FLOOR AREA = 31,704 SF < 32,100.4 SF o.k.  
PROPOSED FAR = 1.97 < 2.0 o.k.

MAX. FLOOR AREA RATIO FOR ENTIRE BUILDING = 3.75  
MAX. PERMITTED FLOOR AREA FOR ENTIRE BUILDING = 60,188.25 SF  
PROPOSED FLOOR AREA = 60,086 SF < 60,188.25 SF o.k.  
PROPOSED FAR = 3.74 < 3.75 o.k.

DWELLING FACTORS 23-22  
DWELLING FACTOR = 680  
= (LOT AREA) x (MAX. FAR - ACTUAL COMM. FAR) / FACTOR  
= 16050.2 x (3.7 - 1.97) / 680  
= 16050.2 x 1.77 / 680 = 42 UNITS ALLOWED  
PROPOSED 42 UNITS < 42 o.k.

23-693 (a)  
NOT EXCEED A HEIGHT OF 35' IF THE DISTRICT IS WITHIN 25' OF R4 DISTRICT

YARD REGULATIONS 35-51  
NO FRONT YARD REQUIRED

35-53  
NO REAR YARD REQUIRED FOR CORNER LOT

33-261 BEYOND 100' OF A STREET LINE  
20' OF REAR YARD REQUIRED

33-291 REQUIRED YARD ALONG DISTRICT BOUNDARY  
A SIDE YARD OF 8' WIDE ALONG BOUNDARY

STREET WALL LOCATION AND HEIGHT AND SETBACK REGULATIONS

123-662 (b) STREET WALL LOCATION:  
AT LEAST 70% OF THE AGGREGATE WIDTH OF THE STREET WALLS SHALL BE LOCATED WITHIN 8' OF THE STREET LINE AND SHALL EXTEND TO AT LEAST THE MIN BASE HEIGHT, THE REMAINING 30% OF STREET WALLS MAY BE LOCATED BEYOND 8' OF THE STREET LINE.

FOR ZONING LOTS BOUNDED BY MORE THAN ONE STREET LINE, THESE STREET WALL SHALL BE MANDATORY ALONG ONLY ONE STREET LINE

(c) SETBACK  
AT A HEIGHT NOT LOWER THAN THE MIN. BASE HEIGHT OR HIGHER THAN THE MAX BASE HEIGHT, AT LEAST 10' SETBACK FROM THE STREET WALL SHALL BE PROVIDED ON A WIDE STREET, 15' SHALL BE PROVIDED ON A NARROW STREET

C2 MAPPED IN R7X ON A WIDE STREET AND WITHIN A DISTANCE OF 100' FROM A WIDE STREET:  
MIN. BASE HEIGHT = 60 FEET  
MAX. BASE HEIGHT = 85 FEET  
MAX. BUILDING HEIGHT = 125 FEET

PROPOSED BUILDING HEIGHT = 83'-11"

**PARKING COMPUTATIONS**

36-21  
HOTEL GUESTROOMS: 1/12 ROOMS OR SUITE = 93/12 = 7.75  
PARKING SPACES  
EATING & DRINKING, BANQUET/MEETING HALL = 1/12 PERSONS  
= 84/12 = 7 PARKING SPACES  
TOTAL OF COMMERCIAL PARKING = 14.75

36-231  
WAIVER FOR SPACES BELOW MIN. NUMBER: 25 IN C2-3  
14.75 < 25 THEREFORE, COMMERCIAL SPACES WAIVED

25-23  
AT LEAST 50% OF DWELLING UNITS FOR DEVELOPMENT  
PURSUANT TO QUALITY HOUSING  
PROPOSED 42 DWELLING UNITS = 21 PARKING SPACES  
REQUIRED

TOTAL OF REQ'D PARKING = 21 + 10% QUEUING = 23  
TOTAL OF 23 PARKING SPACES REQUIRED  
TOTAL OF 23 PARKING SPACES PROVIDED

36-62  
LOADING BERTH  
HOTEL FIRST 100,000 SF NONE

31,704 SF PROVIDED, NONE REQUIRED

36-711  
1 BICYCLE SPACE REQUIRED FOR EVERY 10,000 SF OF USE  
GROUP 5A:  
31,704 / 10,000 = 3 BICYCLE SPACE REQUIRED < 3  
WAIVED

1 BICYCLE SPACE REQUIRED FOR EVERY TWO DWELLING UNITS  
42 / 2 = 21 BICYCLE SPACE REQUIRED  
21 BICYCLE SPACES REQUIRED

21 BICYCLE SPACES PROVIDED

26-41 STREET TREES CALCULATION  
PROVIDE ONE STREET TREE AT LEAST 3 INCH CALIPER EVERY  
25' OF STREET FRONTAGE OF THE PROPERTY

QUEENS BLVD:  
- 141.15' / 25' = 5.65 STREET TREE REQUIRED

64ST STREET:  
- 120.92' / 25' = 4.84 STREET TREE REQUIRED

5.65 + 4.84 = 10.49 = 10 STREET TREE REQUIRED

4 STREET TREES TO BE PLANTED ON SITE;  
6 TREES TO BE PLANTED OFF SITE



PROJECT:  
**HOLIDAY INN EXPRESS**  
64-06 QUEENS BLVD,  
WOODSIDE, NY

DRAWING TITLE:  
**ZONING ANALYSIS**

STRUCTURAL ENGINEER:  
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ENGINEERING SERVICES  
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MEP ENGINEER:  
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Mechanical/Plumbing/Electrical Engineer  
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Email: info@raymondchanarchitect.com  
Web: www.raymondchanarchitect.com

DATE: **04/02/15** DWG. No.:  
PROJ. No.: 21415  
PROJ. MGRER: RCA  
DRAWN BY: **A-002.00**  
CADD FILE No.: 21415-DOB OF -

**421163396**  
DEPARTMENT OF BUILDINGS

SEAL & SIGNATURE:

No.	DATE	DESCRIPTION
-----	------	-------------

**QUALITY HOUSING PROGRAM:**

PROPOSED PROJECT PURSUANT QUALITY HOUSING PROGRAM AND SHALL COMPLY WITH ALL SECTIONS OF ARTICLE II CHAPTER 8

28-21 MINIMUM SIZE OF DWELLING = 400 SF.  
 -- GROSS AREA OF ALL DWELLING UNITS > 400 SF.

28-22 ALL WINDOWS IN THE RESIDENTIAL PORTION SHALL BE DOUBLE GLAZED.  
 -- ALL WINDOWS TO HAVE DOUBLE GLAZED 1" I.G.U. WITH LOW-E COATING.

28-23  
 AT LEAST ONE REFUSE STORAGE AND DISPOSAL FOR RESIDENTIAL USES AND ONE FOR COMMUNITY FACILITY AND COMMERCIAL USES. A REFUSE DISPOSAL ROOM WITH MINIMUM 12 SF AND NO DIMENSION LESS THAN 3 FEET SHALL BE PROVIDED ON EACH STORY WITH ENTRANCES TO DWELLING UNITS. 12 SF OF SUCH REFUSE STORAGE ROOM SHALL BE EXCLUDED FROM FLOOR AREA.  
 -- SEE SUB-CELLAR PLAN ON DRAWING A101 FOR REFUSE DISPOSAL ROOMS.  
 -- SEE RESIDENTIAL FLOOR PLANS FOR DISPOSAL ROOMS.

28-24  
 FLOOR AREA SHALL BE EXCLUDED FROM FLOOR AREA IF:  
 (a) AT LEAST ONE WASHING MACHINE PER 20 DWELLING UNITS AND ONE DRYER PER 40 DWELLING UNITS  
 -- THREE WASHING MACHINES AND FOUR DRYERS ARE PROVIDED FOR 30 UNITS.  
 (b) SUCH MACHINES ARE LOCATED IN A ROOM WITH AN ADDITIONAL THREE SQUARE FEET OF UNOBSTRUCTED FLOOR SPACE EQUIPPED WITH CHAIRS AND FOLDING TABLES  
 -- UNOBSTRUCTED FLOOR SPACES WITH FOLDING TABLES AND WAITING AREA ARE PROVIDED, SEE DWG A102.

28-25  
 50% OF CORRIDOR MAY BE EXCLUDED FROM FLOOR AREA IF A WINDOW WITH A CLEAR, NON-TINTED, GLAZED AREA OF AT LEAST 20 SF IS PROVIDED IN SUCH CORRIDOR, PROVIDED THAT SUCH WINDOW IS DIRECTLY VISIBLE FROM 50% OF THE CORRIDOR AND 20' FROM A SIDE LOT LINE

28-31  
 MINIMUM REQUIRED RECREATION SPACE = 3.3% OF RESIDENTIAL FLOOR AREA.  
 ALL RECREATION SPACE SHALL COMPLY TO STANDARDS FOR RECREATION SPACE SET FORTH IN 28-32.  
 28,382 SF x 3.3% = 937 SF REQ'D  
 -- 937 SF INDOOR RECREATION SPACE (3.3%) IS PROVIDED ON SEVENTH FLOOR; SEE DRAWING A107.

28-41  
 IF NUMBER OF DWELLING UNITS SERVED BY A VERTICAL CIRCULATION CORE AND CORRIDOR ON EACH STORY DOES NOT EXCEED 11 IN R7 DISTRICT, 50% OF THE CORRIDOR AREA MAY BE EXCLUDED FROM FLOOR AREA  
 -- EACH CORRIDOR WAS SERVED WITH 11 DWELLING UNITS PER PLANS

**ZONING TABLES**

FLOOR	PROPOSED BUILDING FLOOR AREA/(GROSS AREA)	PROPOSED COMMERCIAL FLOOR AREA	PROPOSED RESIDENTIAL FLOOR AREA	PROPOSED NUMBER OF GUEST ROOM	PROPOSED NUMBER OF DWELLING UNIT	NUMBER OF PARKING REQUIRED	MECH. CHASE
SUB-CELLAR	15,915 SF/(15,915 SF)	-	-	-		-	0
CELLAR	10,446 SF/(10,446 SF)	-	-	13		36 / 12 =3 13 / 12 =1.1 48 / 12 =4	0
1ST	8,880 SF/(9,028 SF)	8,054.5 SF	825.5 SF	16		16 / 12 =1.33	148 SF
2ND	8,826 SF/(9,038 SF)	8,589.5 SF	236.5 SF	24		24 / 12 =2	212 SF
3RD	8,826 SF/(9,038 SF)	8,589.5 SF	236.5 SF	24		24 / 12 =2	212 SF
4TH	6,707 SF/(8,439 SF)	6,470.5 SF	236.5 SF	16		16 / 12 =1.3	1,732 SF
5TH	7,015 SF/(8,289 SF)	-	7,015 SF	-	11	11 / 2 =5.5	1,274 SF
6TH	7,015 SF/(8,289 SF)	-	7,015 SF	-	11	11 / 2 =5.5	1,274 SF
7TH	7,015 SF/(8,289 SF)	-	7,015 SF	-	11	11 / 2 =5.5	1,274 SF
8TH	5,802 SF/(8,177 SF)	-	5,802 SF	-	9	9 / 2 =4.5	2,375 SF
BULKHEAD/ROOF	0 SF/(1,377 SF)		0 SF				1,377 SF
TOTAL	60,086 SF/(96,325 SF)	31,704 SF	28,382 SF	93	42	COMM.= 14.75 RES.= 21	
F.A.R. (LOT AREA= 16,050.2 SF)	60,086/16,050.2 = 3.74 < 3.75 (MAX)	31,704/16,050.2 = 1.97 < 2.0 (MAX)	28,382/16,050.2 = 1.77 < 3.75 (MAX)			COMM. =14.75<25 WAIVED RES. =21 +(21x10%)=23	

ACCESSIBLE DWELLING AND SLEEPING UNITS PER BC TABLE 1107.6.1		
TOTAL NUMBER OF UNITS PROVIDED	MIN. REQ'D NUM. OF ACCE. UNITS ASSOCIATED WITH ROLL-IN SHOWERS	TOTAL NUMBER OF REQ'D ACCESSIBLE UNITS
76-100	1	5
93 PROPOSED	3 PROVIDED > 1 o.k.	5 PROVIDED o.k.

UNITS REQUIRED TO HAVE AUDIBLE AND VISUAL SMOKE AND CARBON MONOXIDE DETECTORS PER BC TABLE 1107.6.1.1	
REQUIRED MIN. NUMBER OF DWELLING UNITS	PROPOSED NUMBER OF DWELLING UNITS
3% OF 93 HOTEL GUESTROOMS	7 PROVIDED > 3 o.k.



PROJECT:  
**HOLIDAY INN EXPRESS**  
 64-06 QUEENS BLVD,  
 WOODSIDE, NY

DRAWING TITLE:  
 ZONING ANALYSIS

STRUCTURAL ENGINEER:  
**TIMES BUILDINGS PC**  
 ENGINEERING SERVICES  
 8534 GRAND AVE. 2nd FL. ELMHURST, NY 11373  
 TEL: (718) 502-9631 FAX: (718) 228-7348  
 WEB: WWW.TBES.US EMAIL: INFO@TBES.US

MEP ENGINEER:  
 EJC ENGINEERING, PLLC  
 Mechanical/Plumbing/Electrical Engineer  
 136-21 ROOSEVELT AVE, FLUSHING, NY 11354  
 Tel: (718) 353-8010; ejceng@verizon.net



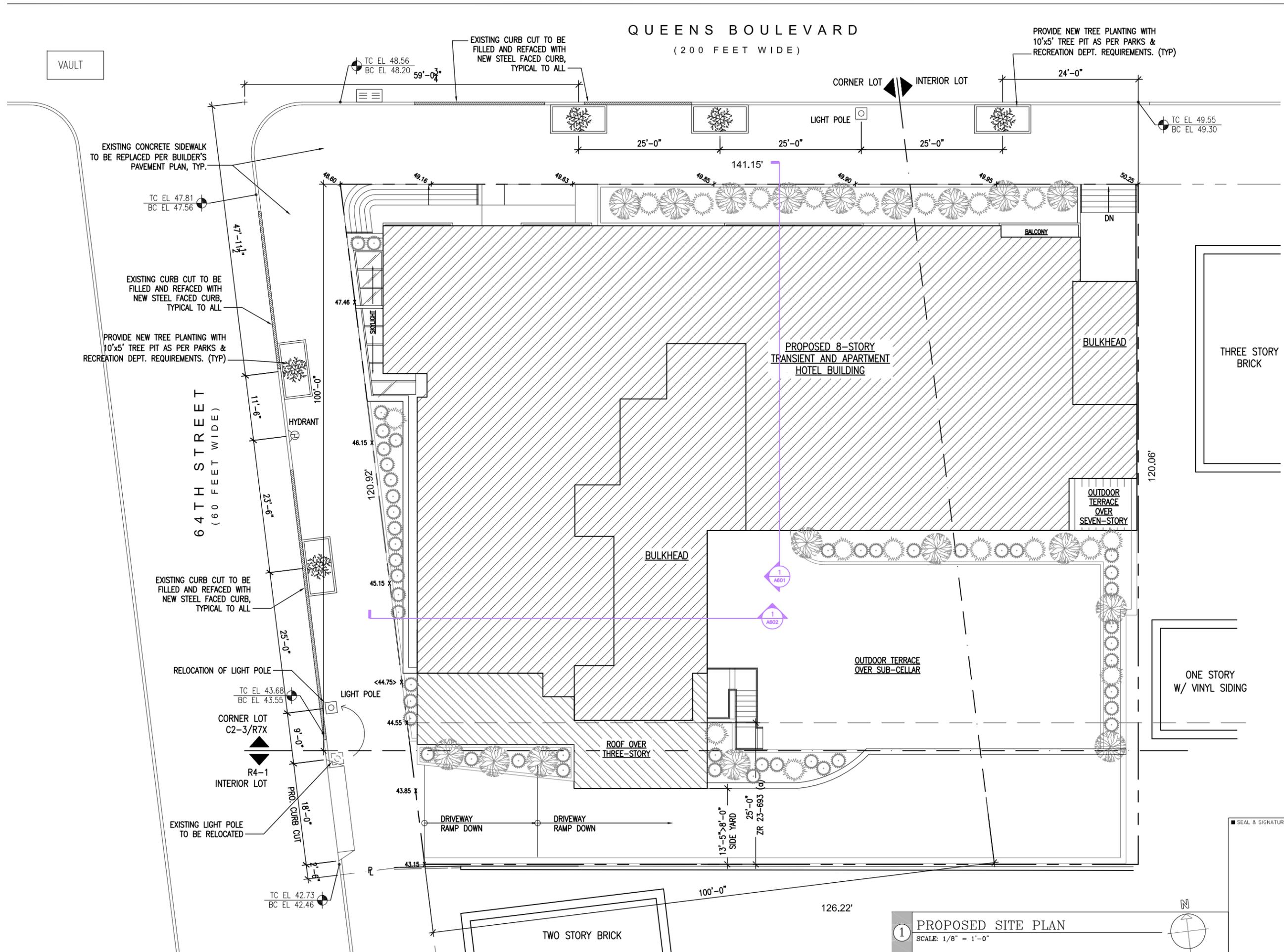
ARCHITECTS • PLANNERS  
 136-40 39TH AVENUE FLUSHING, NY 11354  
 Tel: (718) 445-2345 Fax: (718) 359-8809  
 Email: info@raymondchanarchitect.com  
 Web: www.raymondchanarchitect.com  
 DATE: 04/02/15 DWG. No.:  
 PROJ. No.: 21415  
 PROJ. MGRER: RCA  
 DRAWN BY: \_\_\_\_\_  
 CADD FILE No.: \_\_\_\_\_  
 21415-DOB

SEAL & SIGNATURE:

**A-003.00**

**421163396**  
 DEPARTMENT OF BUILDINGS

No.	DATE	DESCRIPTION
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PROJECT:  
**HOLIDAY INN EXPRESS**  
 64-06 QUEENS BLVD,  
 WOODSIDE, NY  
 DRAWING TITLE:

SITE PLAN

STRUCTURAL ENGINEER:  
**TB TIMES BUILDINGS PC**  
**ENGINEERING SERVICES**  
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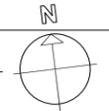


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 PROJ. No.: 21415  
 PROJ. MGR: RCA  
 DRAWN BY: A-004.00  
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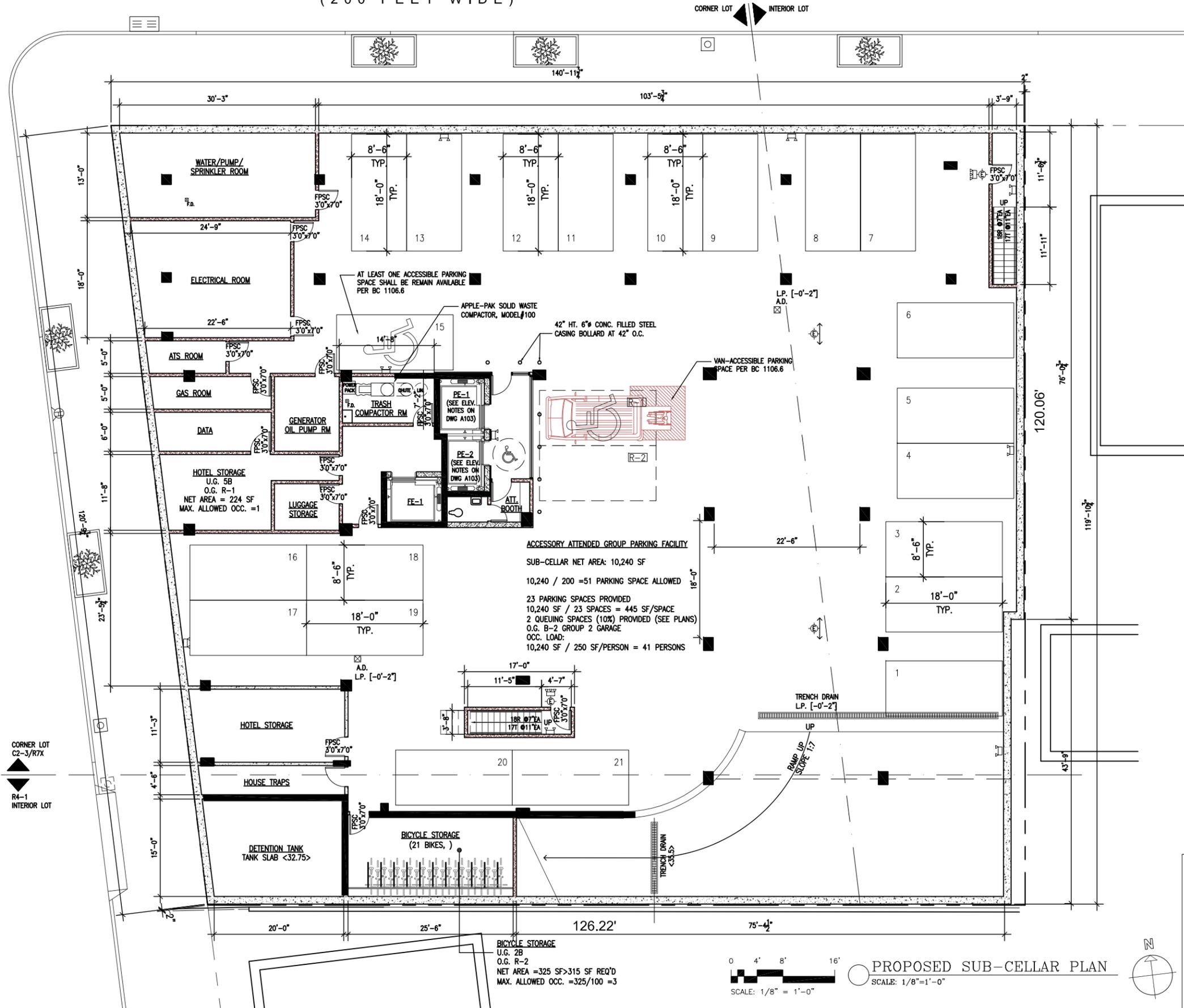
421163396  
 DEPARTMENT OF BUILDINGS

**1 PROPOSED SITE PLAN**  
 SCALE: 1/8" = 1'-0"



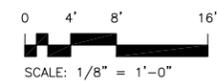
**QUEENS BOULEVARD**  
(200 FEET WIDE)

**64TH STREET**  
(60 FEET WIDE)



**ACCESSORY ATTENDED GROUP PARKING FACILITY**  
 SUB-CELLAR NET AREA: 10,240 SF  
 10,240 / 200 = 51 PARKING SPACE ALLOWED  
 23 PARKING SPACES PROVIDED  
 10,240 SF / 23 SPACES = 445 SF/SPACE  
 2 QUEUING SPACES (10%) PROVIDED (SEE PLANS)  
 O.G. B-2 GROUP 2 GARAGE  
 OCC. LOAD:  
 10,240 SF / 250 SF/PERSON = 41 PERSONS

**BICYCLE STORAGE**  
 U.G. 2B  
 O.G. R-2  
 NET AREA = 325 SF > 315 SF REQ'D  
 MAX. ALLOWED OCC. = 325/100 = 3



**PROPOSED SUB-CELLAR PLAN**  
 SCALE: 1/8" = 1'-0"



PROJECT:  
**HOLIDAY INN EXPRESS**  
 64-06 QUEENS BLVD,  
 WOODSIDE, NY  
 DRAWING TITLE:

PROPOSED SUB-CELLAR PLAN

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 PROJ. No.: 21415  
 PROJ. MGR: RCA  
 DRAWN BY: **A-101.00**  
 CADD FILE No.: 21415-DOB

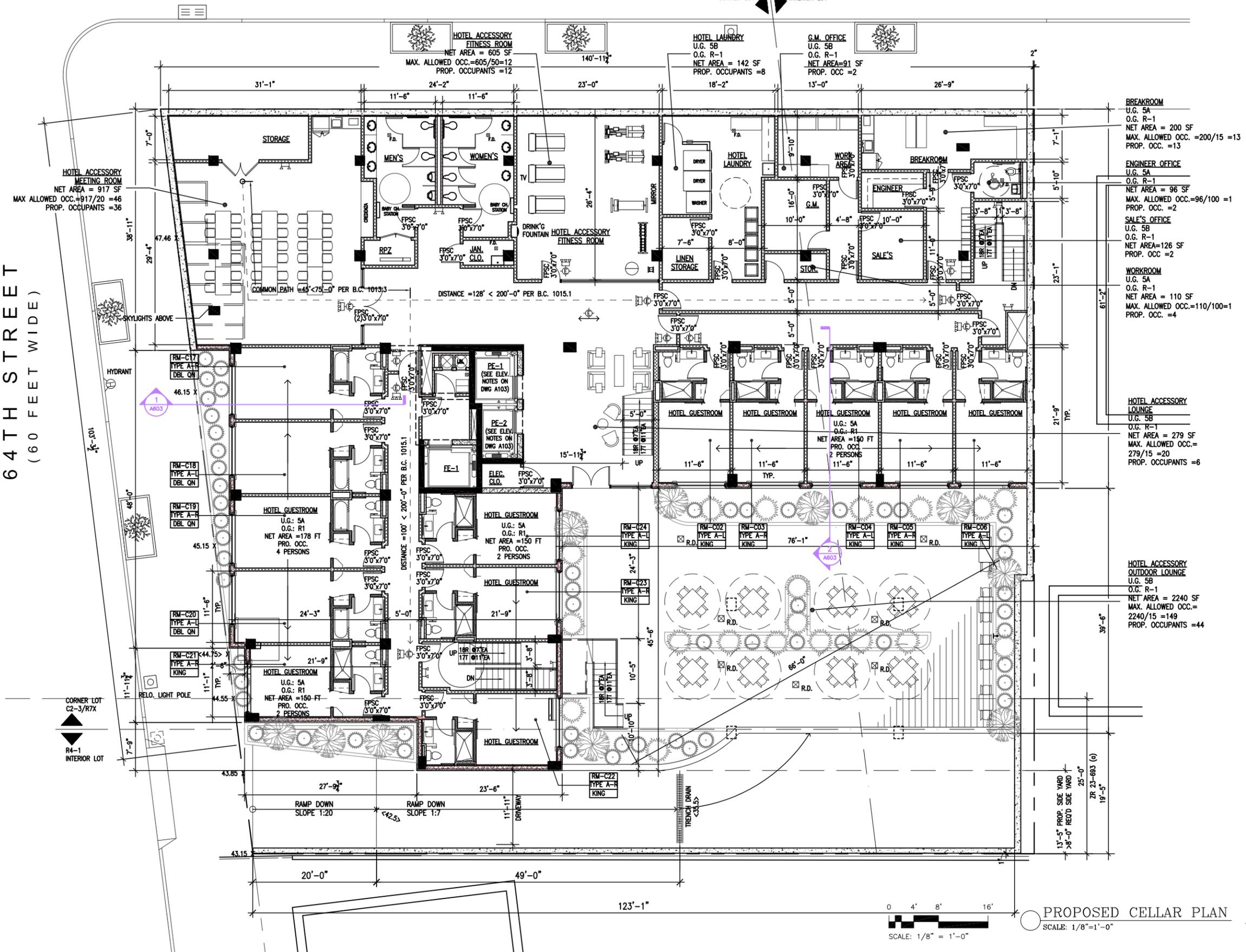
**421163396**  
 DEPARTMENT OF BUILDINGS

# QUEENS BOULEVARD

(200 FEET WIDE)

CORNER LOT ◀ INTERIOR LOT

64TH STREET  
(60 FEET WIDE)



**BREAKROOM**  
U.G. 5A  
O.G. R-1  
NET AREA = 200 SF  
MAX. ALLOWED OCC.=200/15 =13  
PROP. OCC. =13

**ENGINEER OFFICE**  
U.G. 5A  
O.G. R-1  
NET AREA = 96 SF  
MAX. ALLOWED OCC.=96/100 =1  
PROP. OCC. =2

**SALE'S OFFICE**  
U.G. 5B  
O.G. R-1  
NET AREA=126 SF  
PROP. OCC =2

**WORKROOM**  
U.G. 5A  
O.G. R-1  
NET AREA = 110 SF  
MAX. ALLOWED OCC.=110/100=1  
PROP. OCC. =4

**HOTEL ACCESSORY LOUNGE**  
U.G. 5B  
O.G. R-1  
NET AREA = 279 SF  
MAX. ALLOWED OCC.= 279/15 =20  
PROP. OCCUPANTS =6

**HOTEL ACCESSORY OUTDOOR LOUNGE**  
U.G. 5B  
O.G. R-1  
NET AREA = 2240 SF  
MAX. ALLOWED OCC.= 2240/15 =149  
PROP. OCCUPANTS =44



PROJECT:  
**HOLIDAY INN EXPRESS**

64-06 QUEENS BLVD,  
WOODSIDE, NY

DRAWING TITLE:  
**PROPOSED CELLAR PLAN**

STRUCTURAL ENGINEER:  
**TIMES BUILDINGS PC  
ENGINEERING SERVICES**  
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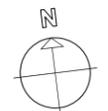
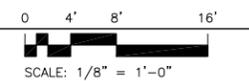


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**421163396**  
DEPARTMENT OF BUILDINGS

**PROPOSED CELLAR PLAN**  
SCALE: 1/8" = 1'-0"



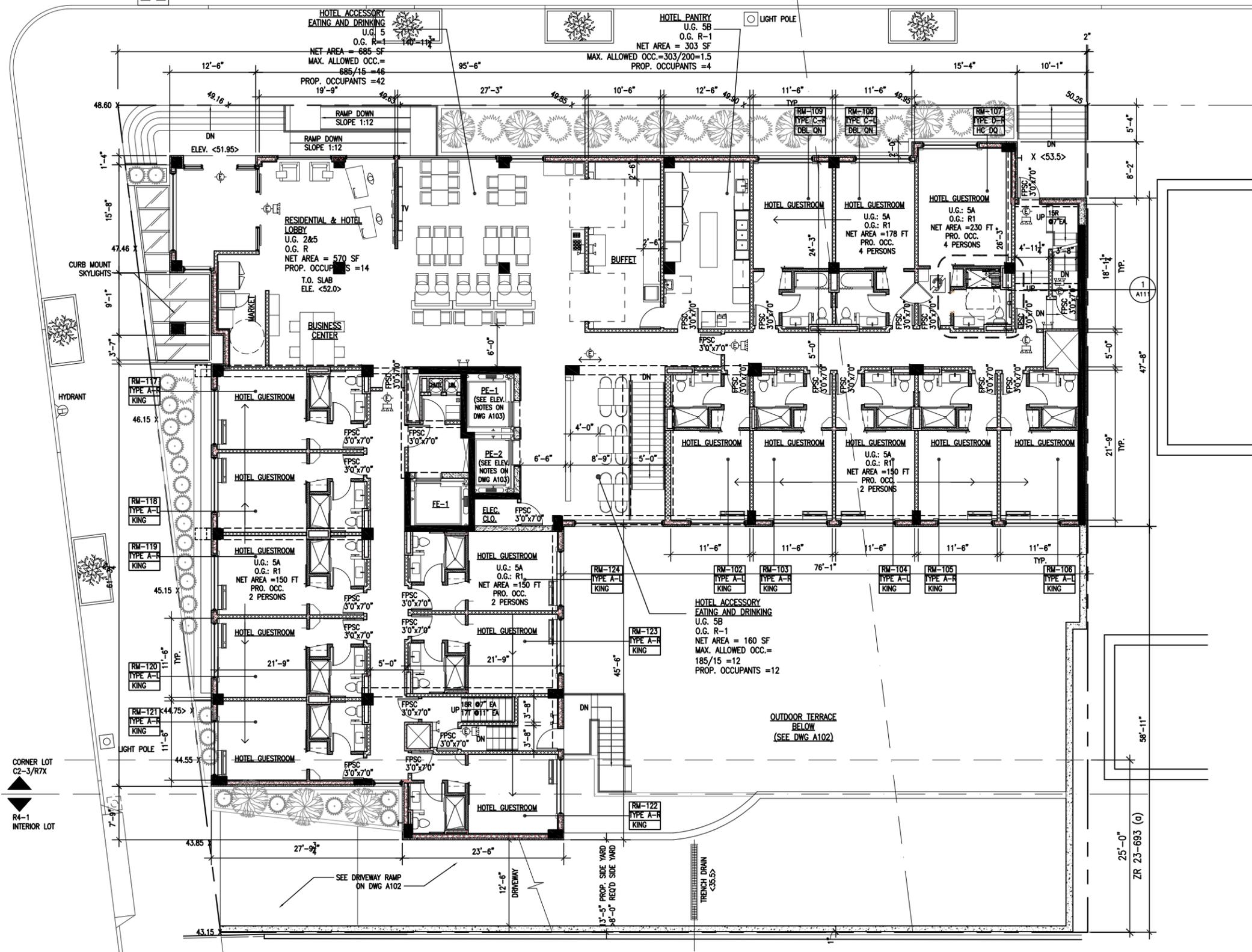
SEAL & SIGNATURE:

# QUEENS BOULEVARD

(200 FEET WIDE)

CORNER LOT ◀ INTERIOR LOT

64TH STREET  
(60 FEET WIDE)



**ELEVATOR NOTES:**  
 PE-1  
 STOP AT SUB-CELLAR, CELLAR, FIRST FLOOR AND COMMERCIAL FLOORS (SECOND-FOURTH FLOOR) ONLY  
 PE-2  
 STOP AT SUB-CELLAR, FIRST FLOOR AND RESIDENTIAL FLOORS (FIFTH-EIGHTH FLOOR) ONLY



PROJECT:  
**HOLIDAY INN EXPRESS**  
 64-06 QUEENS BLVD,  
 WOODSIDE, NY  
 DRAWING TITLE:

**PROPOSED FIRST FLOOR PLAN**

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**TIMES BUILDINGS PC**  
 ENGINEERING SERVICES  
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 TEL: (718) 502-9631 FAX: (718) 228-7348  
 WEB: WWW.TBES.US EMAIL: INFO@TBES.US

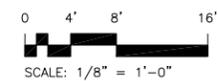
MEP ENGINEER:  
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**421163396**  
 DEPARTMENT OF BUILDINGS



**PROPOSED FIRST FLOOR PLAN**  
 SCALE: 1/8" = 1'-0"



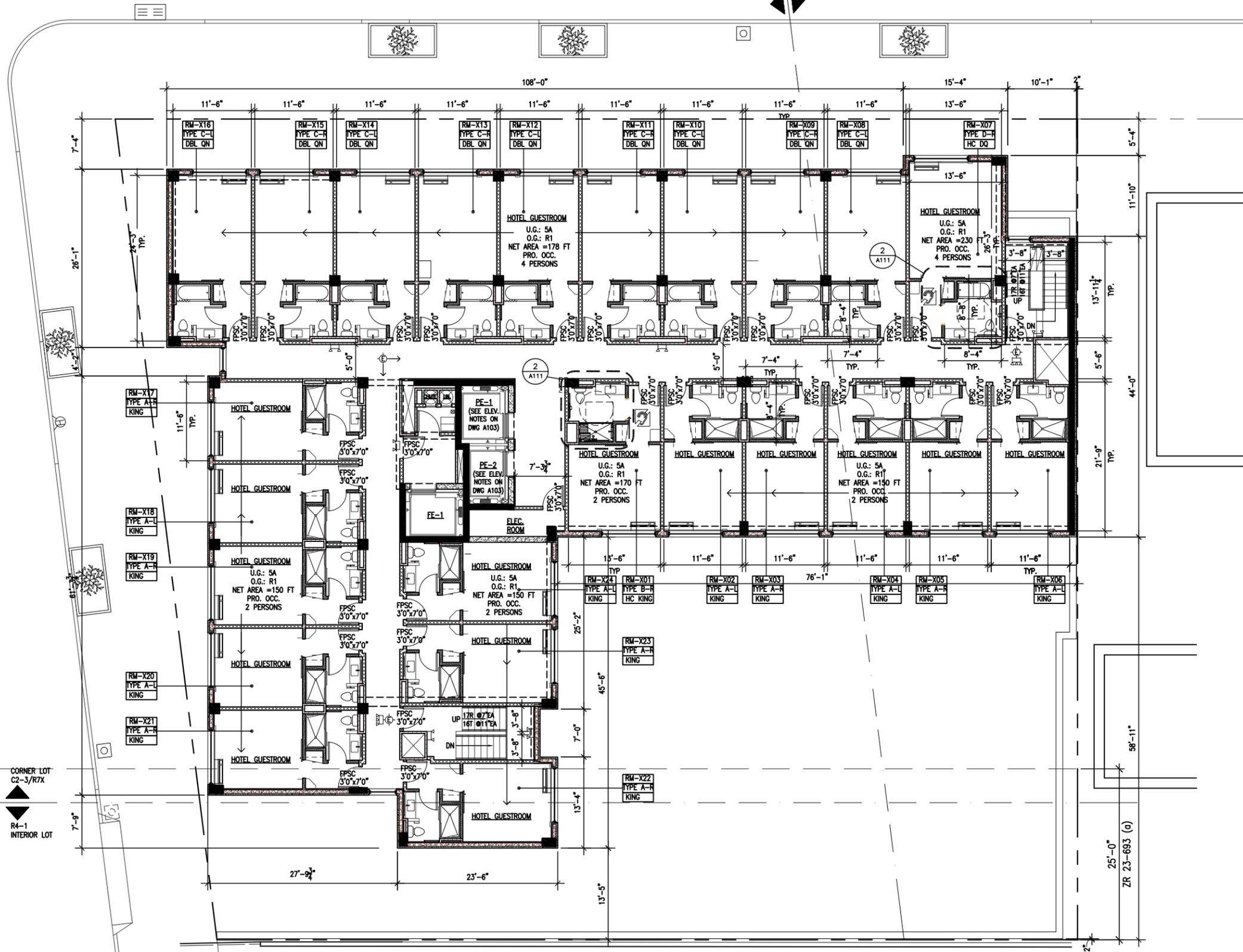
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No.	DATE	DESCRIPTION

QUEENS BOULEVARD  
(200 FEET WIDE)

CORNER LOT ◀ INTERIOR LOT

64TH STREET  
(60 FEET WIDE)



PROJECT:  
**HOLIDAY INN EXPRESS**  
64-06 QUEENS BLVD,  
WOODSIDE, NY  
DRAWING TITLE:

PROPOSED 2ND~3RD FLOOR PLAN

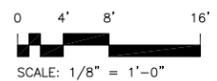
STRUCTURAL ENGINEER:  
**TIMES BUILDINGS PC**  
ENGINEERING SERVICES  
8534 GRAND AVE. 2nd FL. ELMHURST, NY 11373  
TEL: (718) 502-9631 FAX: (718) 228-7348  
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PROPOSED SECOND~THIRD FLOOR PLAN  
SCALE: 1/8" = 1'-0"



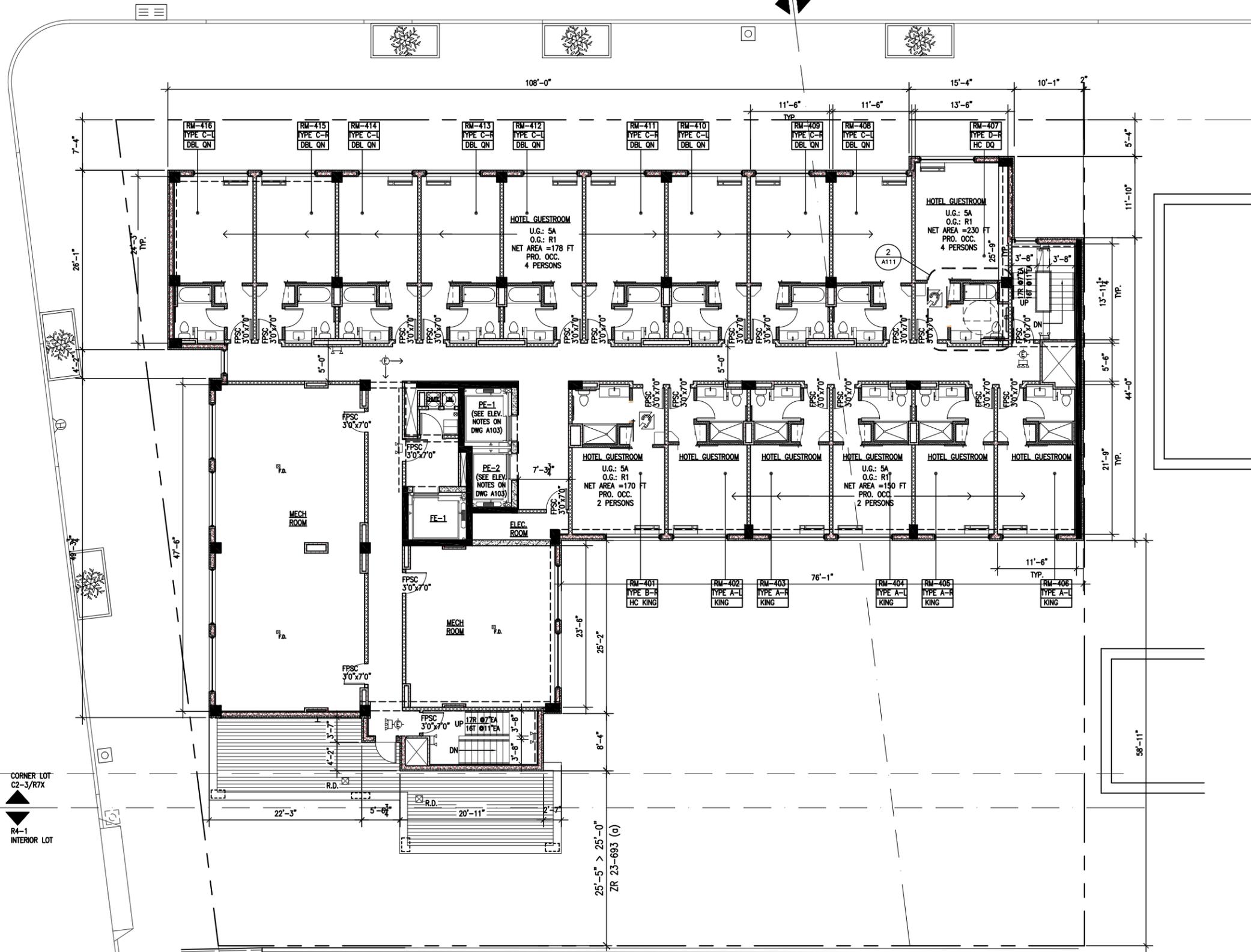
421163396  
DEPARTMENT OF BUILDINGS

No.	DATE	DESCRIPTION

QUEENS BOULEVARD  
(200 FEET WIDE)

CORNER LOT ◀ INTERIOR LOT

64TH STREET  
(60 FEET WIDE)



PROJECT:  
**HOLIDAY INN EXPRESS**  
64-06 QUEENS BLVD,  
WOODSIDE, NY  
DRAWING TITLE:

PROPOSED FOURTH PLAN

STRUCTURAL ENGINEER:  
**TIMES BUILDINGS PC**  
ENGINEERING SERVICES  
8534 GRAND AVE. 2nd FL. ELMHURST, NY 11373  
TEL: (718) 502-9631 FAX: (718) 228-7348  
WEB: WWW.TBES.US EMAIL: INFO@TBES.US

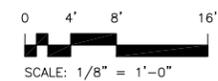
MEP ENGINEER:  
EJC ENGINEERING, PLLC  
Mechanical/Plumbing/Electrical Engineer  
136-21 ROOSEVELT AVE, FLUSHING, NY 11354  
Tel: (718) 353-8010; ejceng@verizon.net



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PROPOSED FOURTH FLOOR PLAN  
SCALE: 1/8" = 1'-0"



**421163396**  
DEPARTMENT OF BUILDINGS

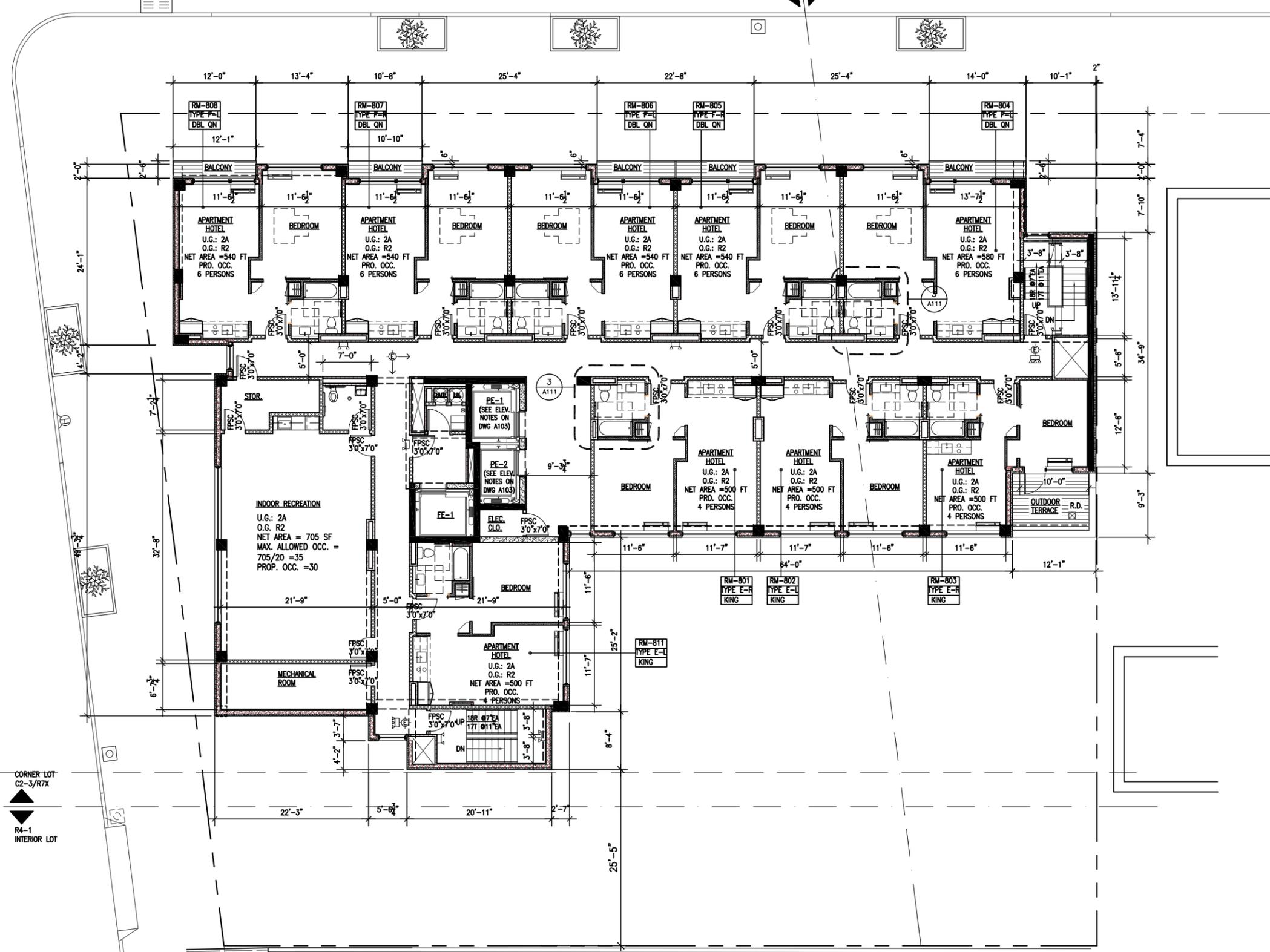


No.	DATE	DESCRIPTION

QUEENS BOULEVARD  
(200 FEET WIDE)

64TH STREET  
(60 FEET WIDE)

CORNER LOT    INTERIOR LOT



PROJECT:  
**HOLIDAY INN EXPRESS**  
64-06 QUEENS BLVD.,  
WOODSIDE, NY  
DRAWING TITLE:

PROPOSED EIGHTH FLOOR PLAN

STRUCTURAL ENGINEER:  
**TB TIMES BUILDINGS PC**  
ENGINEERING SERVICES  
8534 GRAND AVE. 2nd FL. ELMHURST, NY 11373  
TEL: (718) 502-9631 FAX: (718) 228-7348  
WEB: WWW.TBES.US EMAIL: INFO@TBES.US

MEP ENGINEER:  
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Mechanical/Plumbing/Electrical Engineer  
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0 4' 8' 16'  
SCALE: 1/8" = 1'-0"    SCALE: 1/8" = 1'-0"

PROPOSED EIGHTH FLOOR PLAN

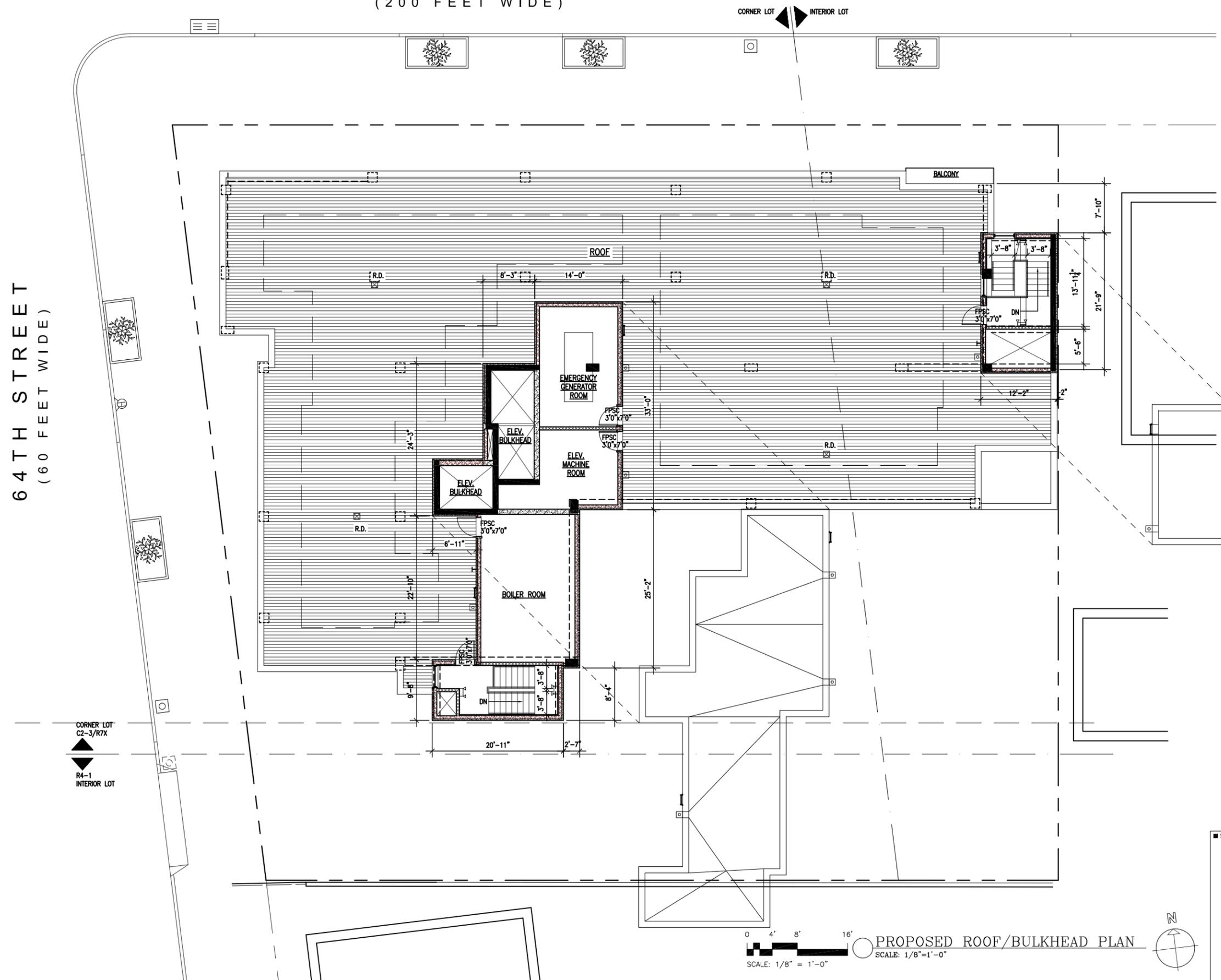


421163396  
DEPARTMENT OF BUILDINGS

No.	DATE	DESCRIPTION
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QUEENS BOULEVARD  
(200 FEET WIDE)

64TH STREET  
(60 FEET WIDE)



PROJECT:  
**HOLIDAY INN EXPRESS**  
64-06 QUEENS BLVD,  
WOODSIDE, NY  
DRAWING TITLE:

PROPOSED ROOF/BULKHEAD PLAN

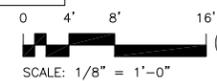
STRUCTURAL ENGINEER:  
**TIMES BUILDINGS PC**  
**ENGINEERING SERVICES**  
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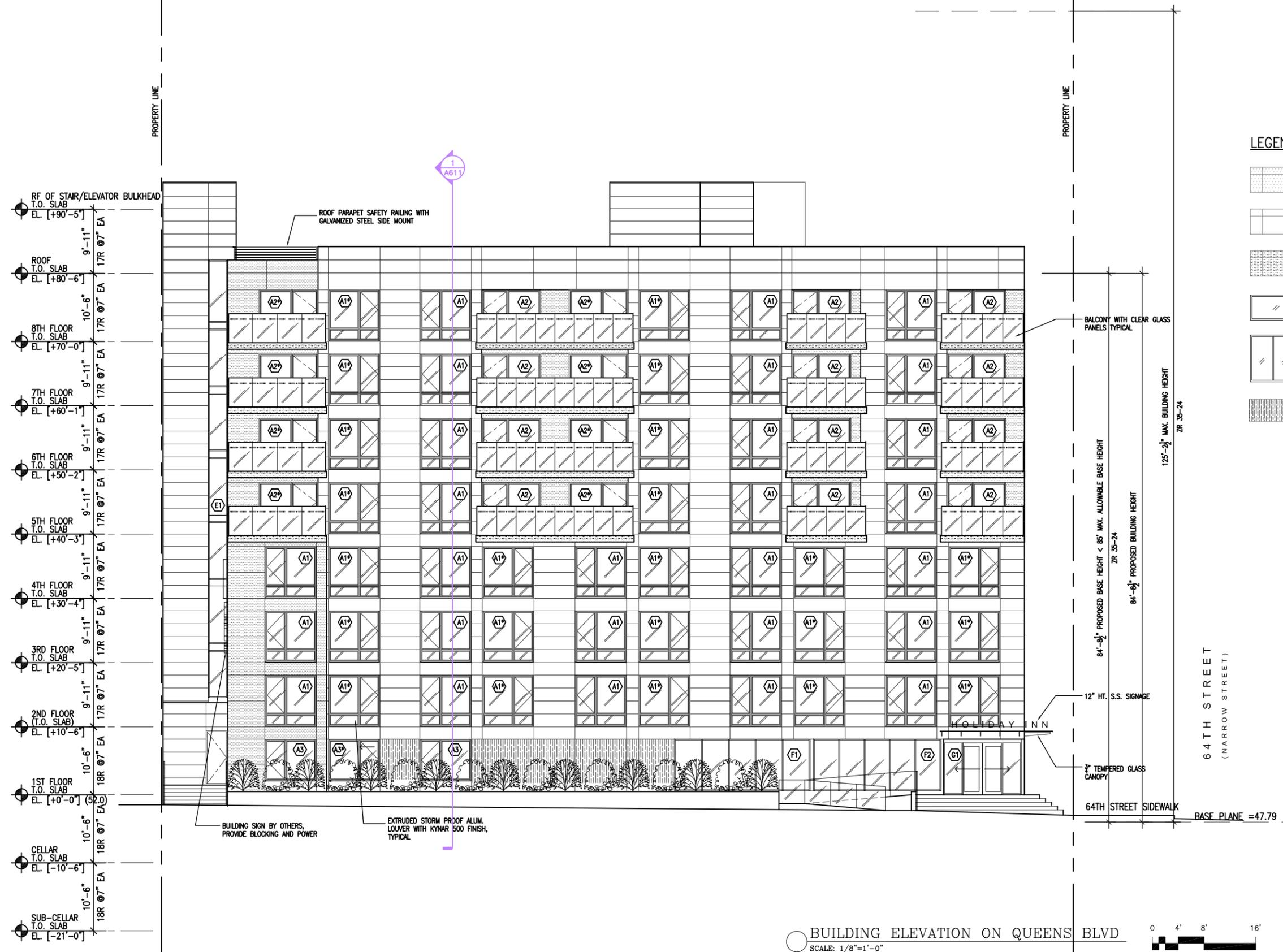


PROPOSED ROOF/BULKHEAD PLAN  
SCALE: 1/8" = 1'-0"



421163396  
DEPARTMENT OF BUILDINGS

No.	DATE	DESCRIPTION



**LEGEND**

-  PORCELAIN TILES BY PORCELANOSA; COLOR WOOD, TO BE DETERMINED
-  COMPOSITE PANEL; 2" CENTRIA FORMAWALL DIMENSION INSULATED METAL PANEL; COLOR WHITE, TO BE DETERMINED
-  COMPOSITE PANEL; 2" CENTRIA FORMAWALL DIMENSION INSULATED METAL PANEL; COLOR SILVER, TO BE DETERMINED
-  3/4" CLEAR TEMPERED INSULATED STOREFRONT GLASS
-  1.0" INSULATED TEMPERED WINDOW UNIT; 0.25" THICK CLEAR HEAT STRENGTHENED OUTER LITE; 0.5" AIR SPACE; 0.25" CLEAR HEAT STRENGTHENED INNER LITE; "VIRACON" LOW-E COATING VE 1-2M. METAL SPACER COLOR SHALL BE SILVER, PRIMARY AND SECONDARY EDGE SEAL SHALL BE NEUTRAL GRAY.
-  5/8" THICK NEOPARIES GLASS PANEL WITH HEAVY DUTY S.S. MECHANICAL FASTENER AS PER MANUFACTURER'S REQUIREMENTS; COLOR 3



PROJECT:  
**HOLIDAY INN EXPRESS**  
 64-06 QUEENS BLVD,  
 WOODSIDE, NY  
 DRAWING TITLE:

**BUILDING ELEVATION**

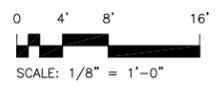
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 21415-DOB

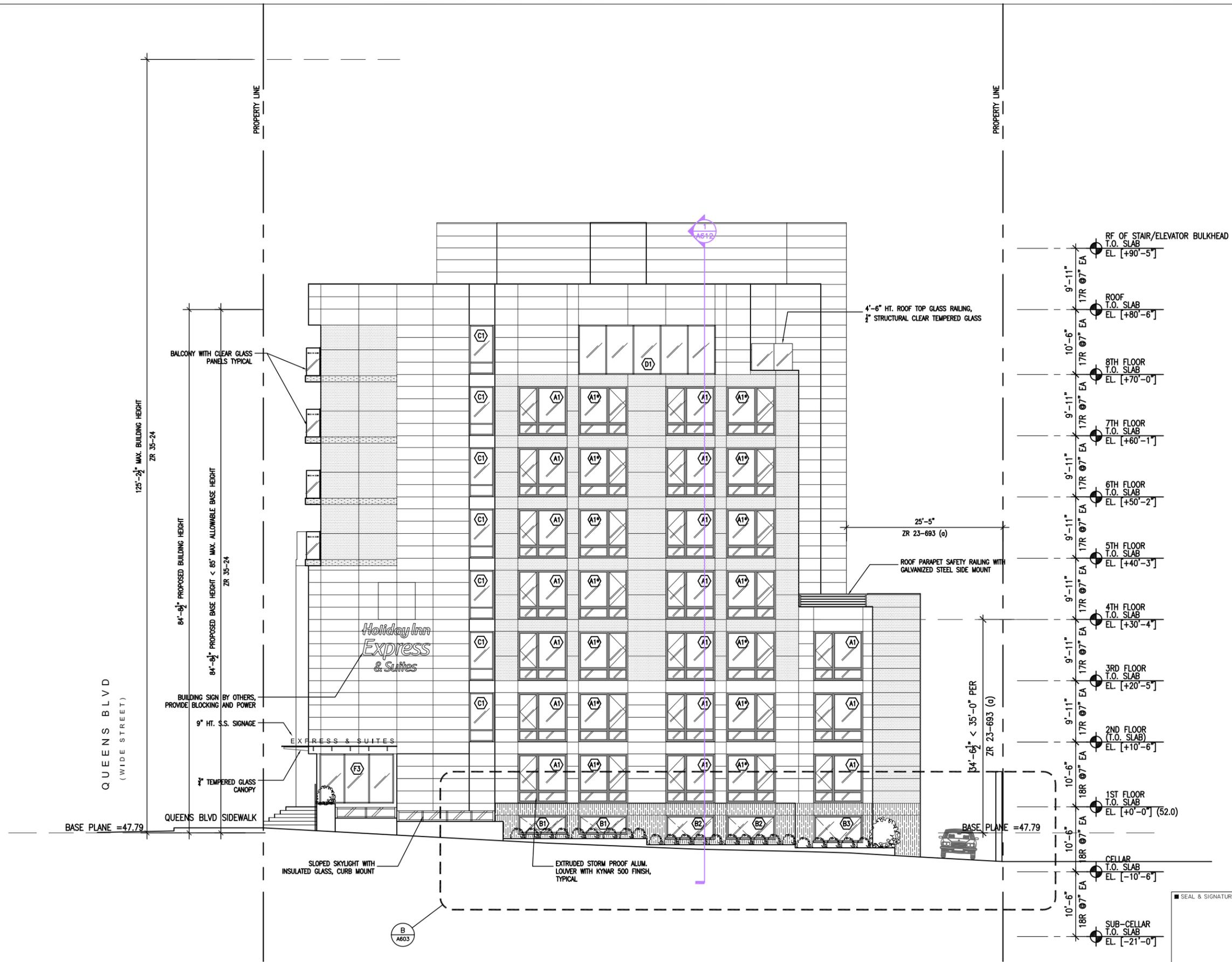
**BUILDING ELEVATION ON QUEENS BLVD**  
 SCALE: 1/8"=1'-0"



SEAL & SIGNATURE:

**421163396**  
 DEPARTMENT OF BUILDINGS

No.	DATE	DESCRIPTION



PROJECT:  
**HOLIDAY INN EXPRESS**  
 64-06 QUEENS BLVD,  
 WOODSIDE, NY  
 DRAWING TITLE:

**BUILDING ELEVATION**

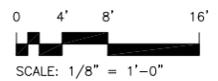
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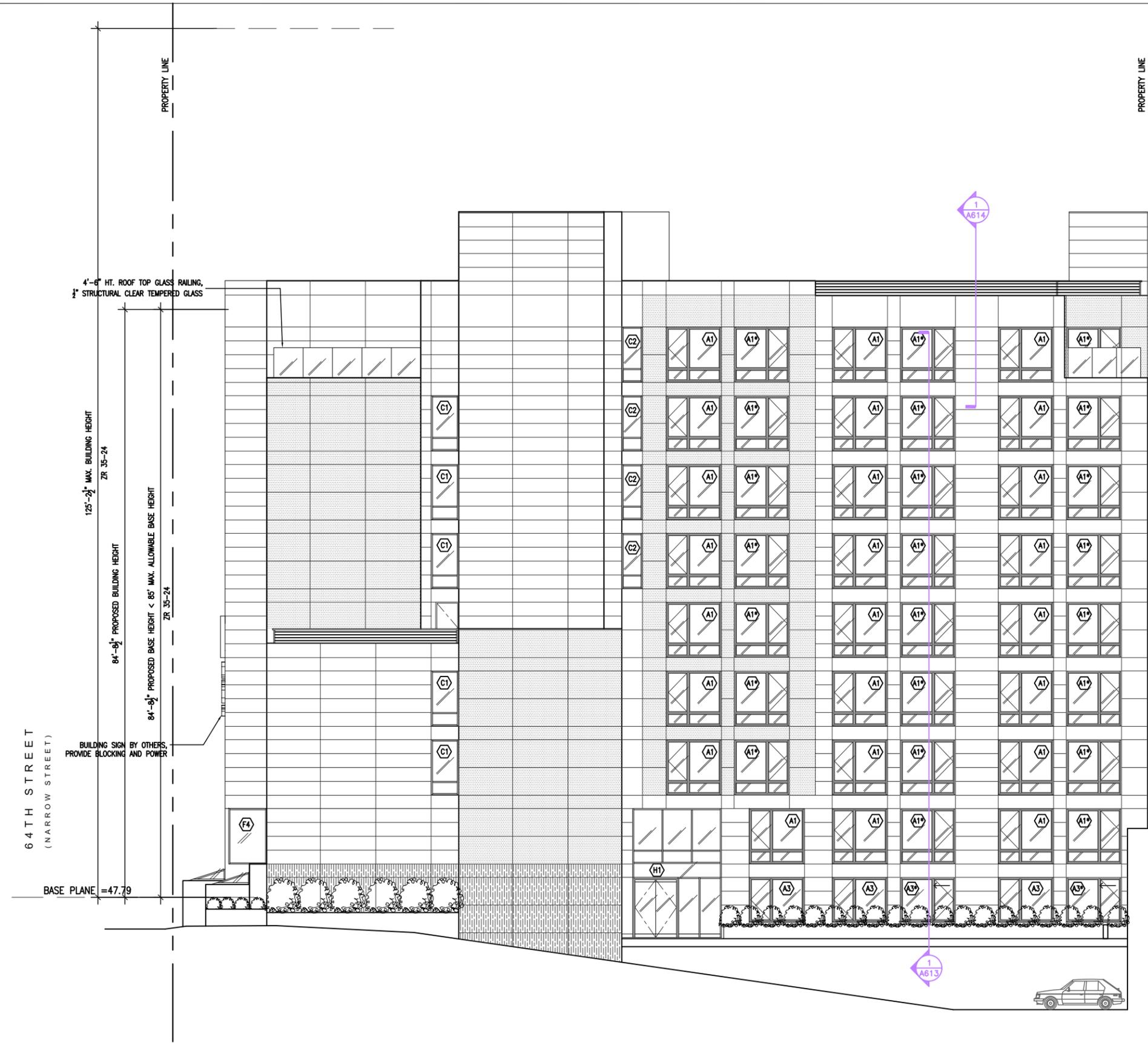
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 DRAWN BY: **A-502.00**  
 CADD FILE No.: 21415-DOB OF -



**BUILDING ELEVATION ON 64TH STREET**  
 SCALE: 1/8"=1'-0"

**421163396**  
 DEPARTMENT OF BUILDINGS

No.	DATE	DESCRIPTION
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18R @ 7" EA	10'-6"	17R @ 7" EA	9'-11"	RF OF STAIR/ELEVATOR BULKHEAD T.O. SLAB EL. [+90'-5"]
18R @ 7" EA	10'-6"	17R @ 7" EA	9'-11"	ROOF T.O. SLAB EL. [+80'-6"]
18R @ 7" EA	10'-6"	17R @ 7" EA	10'-6"	8TH FLOOR T.O. SLAB EL. [+70'-0"]
18R @ 7" EA	9'-11"	17R @ 7" EA	9'-11"	7TH FLOOR T.O. SLAB EL. [+60'-1"]
18R @ 7" EA	9'-11"	17R @ 7" EA	9'-11"	6TH FLOOR T.O. SLAB EL. [+50'-2"]
18R @ 7" EA	9'-11"	17R @ 7" EA	9'-11"	5TH FLOOR T.O. SLAB EL. [+40'-3"]
18R @ 7" EA	9'-11"	17R @ 7" EA	9'-11"	4TH FLOOR T.O. SLAB EL. [+30'-4"]
18R @ 7" EA	9'-11"	17R @ 7" EA	9'-11"	3RD FLOOR T.O. SLAB EL. [+20'-5"]
18R @ 7" EA	9'-11"	17R @ 7" EA	9'-11"	2ND FLOOR (T.O. SLAB) EL. [+10'-6"]
18R @ 7" EA	10'-6"	18R @ 7" EA	10'-6"	1ST FLOOR T.O. SLAB EL. [+0'-0"] (52.0)
18R @ 7" EA	10'-6"	18R @ 7" EA	10'-6"	CELLAR T.O. SLAB EL. [-10'-6"]
18R @ 7" EA	10'-6"	18R @ 7" EA	10'-6"	SUB-CELLAR T.O. SLAB EL. [-21'-0"]

64TH STREET  
(NARROW STREET)

4'-6" HT. ROOF TOP GLASS RAILING,  
1/2" STRUCTURAL CLEAR TEMPERED GLASS

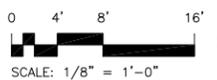
125'-2 1/2" MAX. BUILDING HEIGHT  
ZR 35-24

84'-8 1/2" PROPOSED BUILDING HEIGHT  
ZR 35-24

84'-8 1/2" PROPOSED BASE HEIGHT < 85' MAX. ALLOWABLE BASE HEIGHT  
ZR 35-24

BUILDING SIGN BY OTHERS,  
PROVIDE BLOCKING AND POWER

BASE PLANE = 47.79



**SOUTH BUILDING ELEVATION**

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



PROJECT:  
**HOLIDAY INN EXPRESS**  
64-06 QUEENS BLVD,  
WOODSIDE, NY  
DRAWING TITLE:

BUILDING ELEVATION  
STRUCTURAL ENGINEER:  
**TB TIMES BUILDINGS PC  
ENGINEERING SERVICES**  
8534 GRAND AVE. 2nd FL. ELMHURST, NY 11373  
TEL: (718) 502-9631 FAX: (718) 228-7348  
WEB: WWW.TBES.US EMAIL: INFO@TBES.US

MEP ENGINEER:  
EJC ENGINEERING, PLLC  
Mechanical/Plumbing/Electrical Engineer  
136-21 ROOSEVELT AVE, FLUSHING, NY 11354  
Tel: (718) 353-8010; ejceng@verizon.net



136-40 39TH AVENUE FLUSHING, NY 11354  
Tel: (718) 445-2345 Fax: (718) 359-8809  
Email: info@raymondchanarchitect.com  
Web: www.raymondchanarchitect.com

DATE: **04/02/15** DWG. No.:  
PROJ. No.: 21415  
PROJ. MGR: RCA  
DRAWN BY:  
CADD FILE No.:  
21415-DOB

**A-503.00**

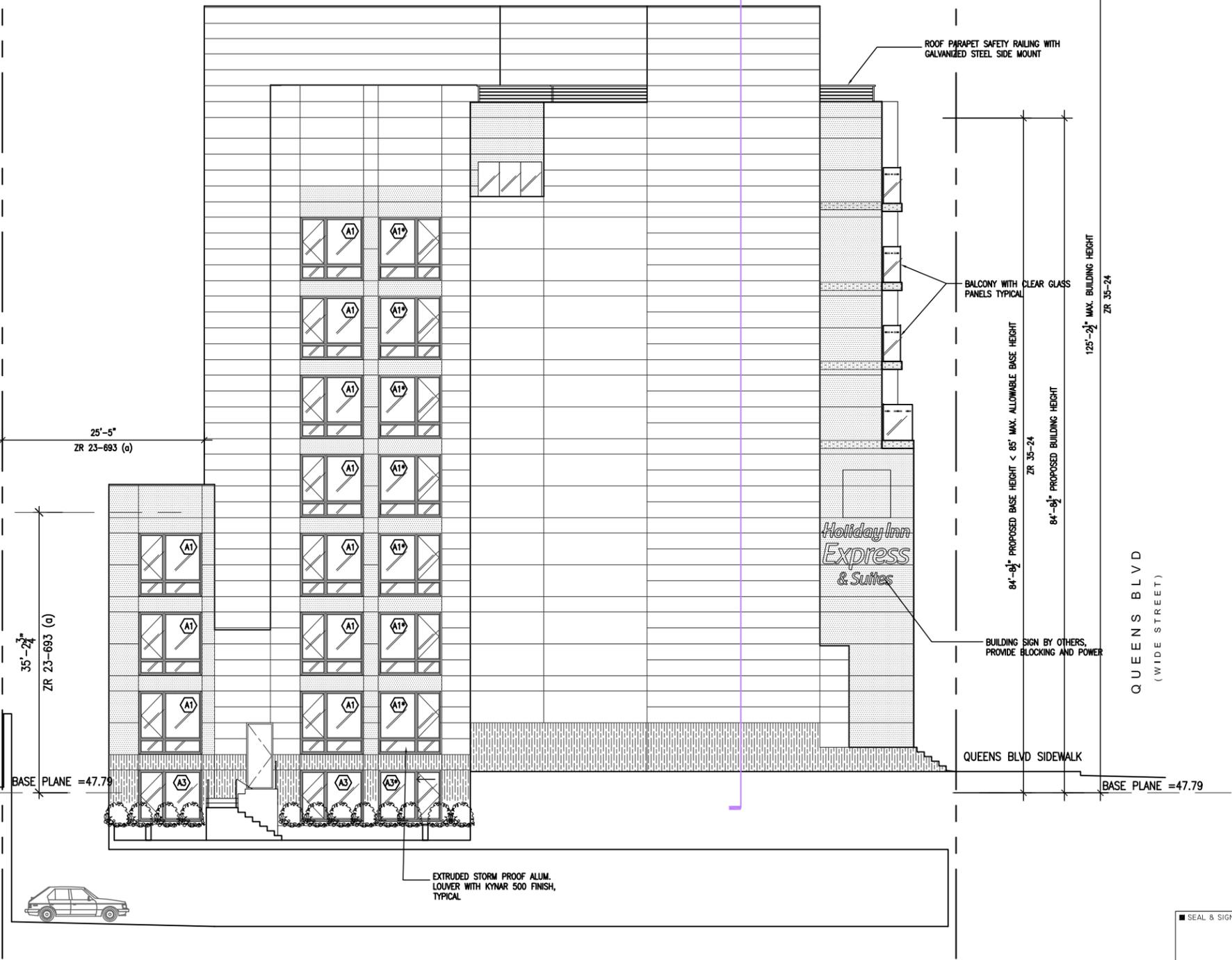
**421163396**  
DEPARTMENT OF BUILDINGS

No.	DATE	DESCRIPTION

RF OF STAIR/ELEVATOR BULKHEAD T.O. SLAB EL. [+90'-5"]	9'-11"	17R 07" EA
ROOF T.O. SLAB EL. [+80'-6"]	10'-6"	17R 07" EA
8TH FLOOR T.O. SLAB EL. [+70'-0"]	9'-11"	17R 07" EA
7TH FLOOR T.O. SLAB EL. [+60'-1"]	9'-11"	17R 07" EA
6TH FLOOR T.O. SLAB EL. [+50'-2"]	9'-11"	17R 07" EA
5TH FLOOR T.O. SLAB EL. [+40'-3"]	9'-11"	17R 07" EA
4TH FLOOR T.O. SLAB EL. [+30'-4"]	9'-11"	17R 07" EA
3RD FLOOR T.O. SLAB EL. [+20'-5"]	10'-6"	18R 07" EA
2ND FLOOR (T.O. SLAB) EL. [+10'-6"]	10'-6"	18R 07" EA
1ST FLOOR T.O. SLAB EL. [+0'-0"] (52.0)	10'-6"	18R 07" EA
CELLAR T.O. SLAB EL. [-10'-6"]	10'-6"	18R 07" EA
SUB-CELLAR T.O. SLAB EL. [-21'-0"]	10'-6"	18R 07" EA

PROPERTY LINE

PROPERTY LINE

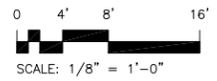


QUEENS BLVD  
(WIDE STREET)

QUEENS BLVD SIDEWALK

BASE PLANE =47.79

BASE PLANE =47.79



EAST BUILDING ELEVATION  
SCALE: 1/8" = 1'-0"



PROJECT:  
**HOLIDAY INN EXPRESS**  
64-06 QUEENS BLVD,  
WOODSIDE, NY

BUILDING ELEVATION

STRUCTURAL ENGINEER:  
**TB TIMES BUILDINGS PC**  
ENGINEERING SERVICES  
8534 GRAND AVE. 2nd FL. ELMHURST, NY 11373  
TEL: (718) 502-9631 FAX: (718) 228-7348  
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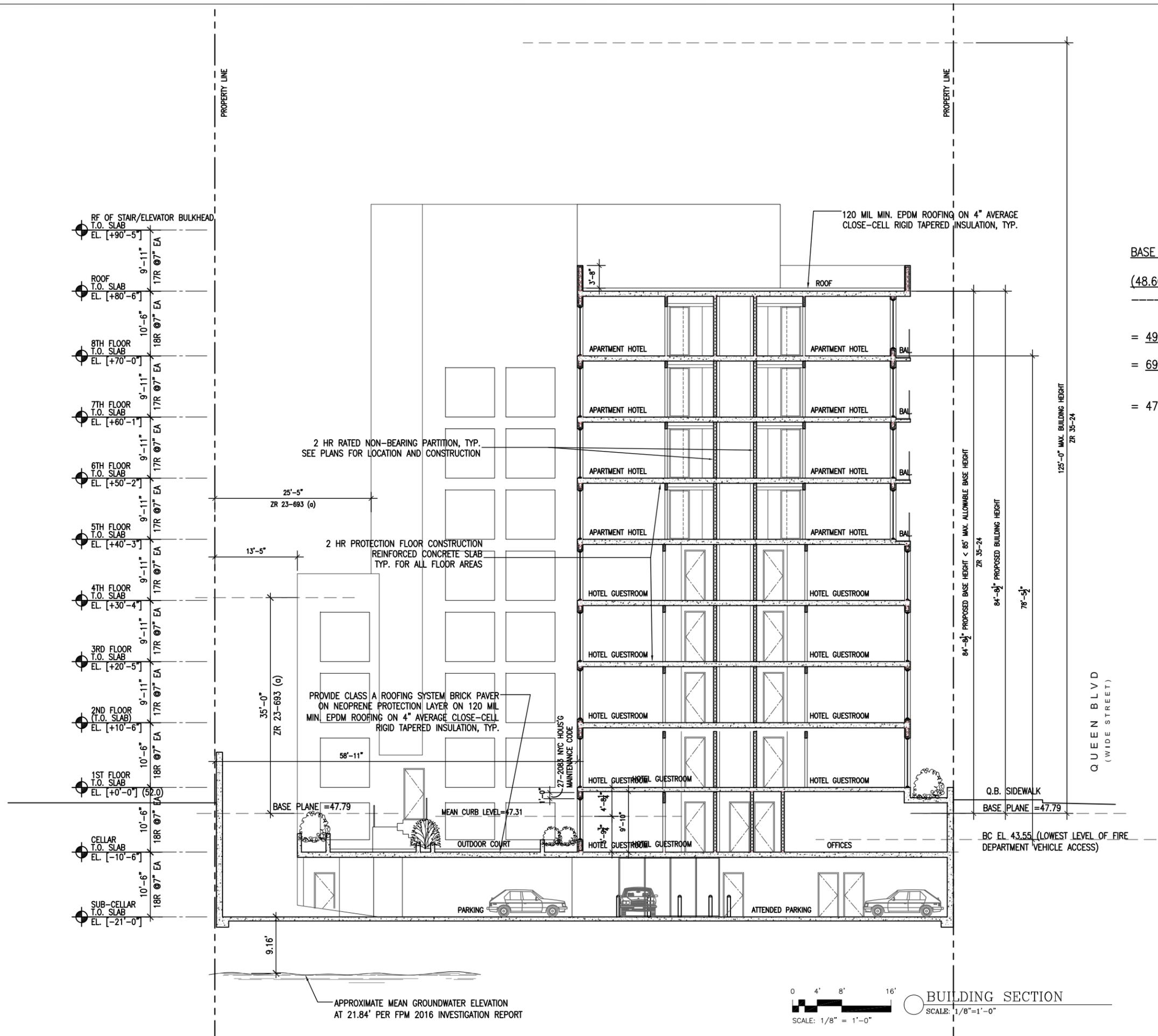
DATE: **04/02/15** DWG. No.:  
PROJ. No.: 21415  
PROJ. MGR: RCA  
DRAWN BY:  
CADD FILE No.:  
21415-DOB

**A-504.00**

**421163396**  
DEPARTMENT OF BUILDINGS

SEAL & SIGNATURE:

No.	DATE	DESCRIPTION



**BASE PLANE CALCULATION**

$$\frac{(48.60+50.25) \times 141.15 + (48.60+43.15) \times 120.92}{2} = 141.15 + 120.92$$

$$= \frac{49.425 \times 141.15 + 45.875 \times 120.92}{262.07}$$

$$= \frac{6976.34 + 5547.21}{262.07}$$

$$= 47.79 \text{ BASE PLANE}$$



PROJECT:  
**HOLIDAY INN EXPRESS**  
 64-06 QUEENS BLVD,  
 WOODSIDE, NY  
 DRAWING TITLE:

**BUILDING SECTION**

STRUCTURAL ENGINEER:  
**TIMES BUILDINGS PC**  
 ENGINEERING SERVICES  
 8534 GRAND AVE. 2nd FL. ELMHURST, NY 11374  
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MEP ENGINEER:  
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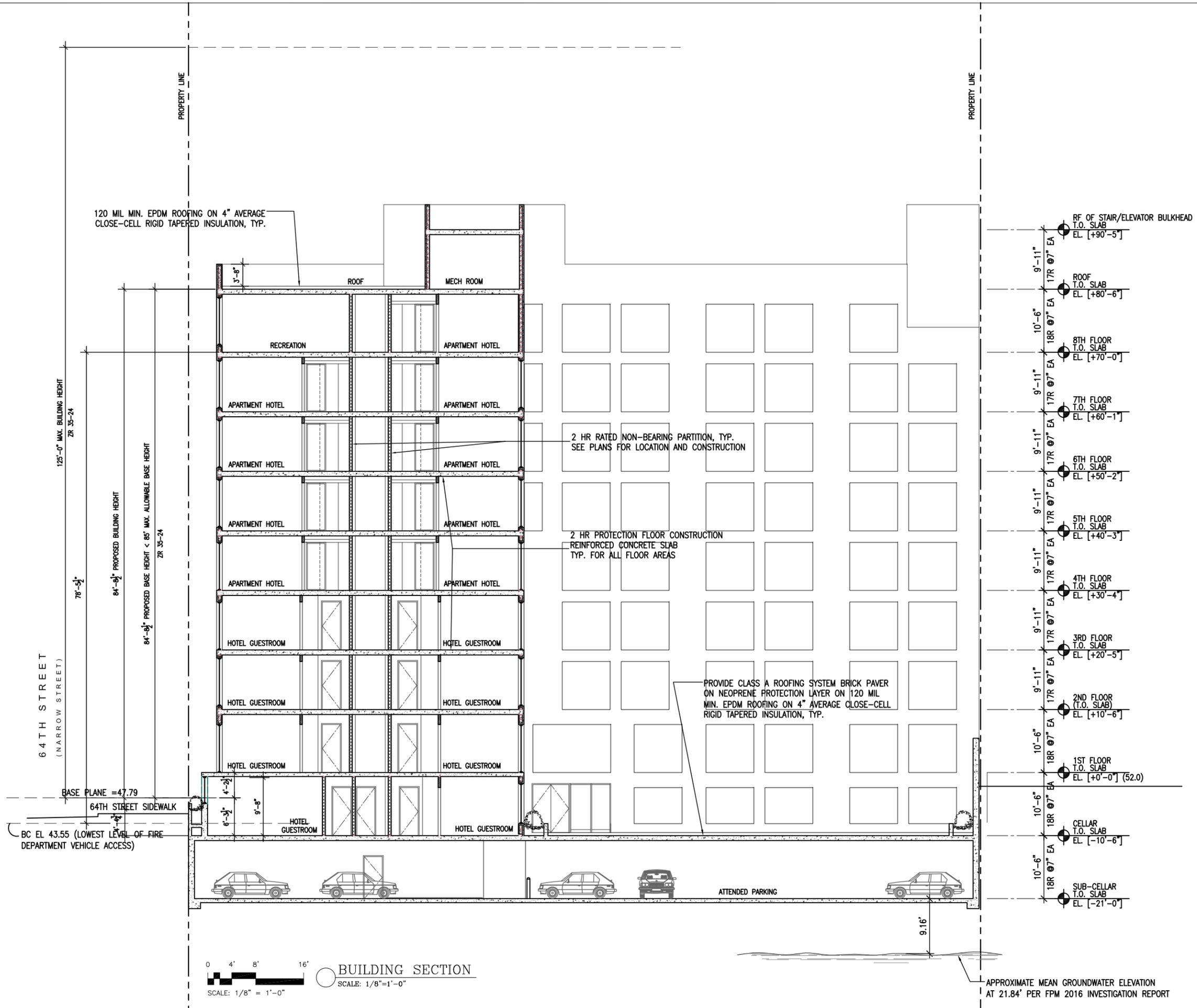
DATE: **04/13/16** DWG. No.:  
 PROJ. No.: 21415  
 PROJ. MGR: RCA  
 DRAWN BY: **A-601.00**  
 CADD FILE No.: 21415-008 OF -

SEAL & SIGNATURE:

**BUILDING SECTION**  
 SCALE: 1/8" = 1'-0"

**421163396**  
 DEPARTMENT OF BUILDINGS

No.	DATE	DESCRIPTION



PROJECT:  
**HOLIDAY INN EXPRESS**  
 64-06 QUEENS BLVD,  
 WOODSIDE, NY  
 DRAWING TITLE:

BUILDING SECTION

STRUCTURAL ENGINEER:  
**TIMES BUILDINGS PC**  
 ENGINEERING SERVICES  
 8534 GRAND AVE. 2nd FL. ELMHURST, NY 11373  
 TEL: (718) 502-9631 FAX: (718) 228-7348  
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 Web: www.raymondchanarchitect.com

DATE: **04/13/16** DWG. No.:  
 PROJ. No.: 21415  
 PROJ. MGR: RCA  
 DRAWN BY: **A-602.00**  
 CADD FILE No.:  
 21415-008

**BUILDING SECTION**  
 SCALE: 1/8" = 1'-0"

## APPENDIX 2

### CITIZEN PARTICIPATION PLAN

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

Name of Public Library Nearest the Site

Repository Address

Repository Telephone Number

Repository Hours of Operation

**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:** No specific issues of concern have been identified for stakeholders proximate to the project site.

**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

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. Recontamination controls in the selected remedy and development of this project will include an on-Site control that provides protection against recontamination originating from currently unknown off-Site sources (the vapor barrier, which will eliminate the risk of future migration of soil vapor contamination from off-Site), and a control employed on-Site to prevent the occurrence of new contamination (a site cover).

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

**Low-Energy Project Management Program:** Queens Boulevard Venture, LLC is participating in OER's low-energy project management program. Under this program, whenever

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

**Trees and Plantings:** Trees and other plantings provide habitat and add to NYC's environmental quality in a wide variety of ways. Native plant species and native habitat provide optimal support to local fauna, promote local biodiversity, and require less maintenance. An estimate of the land area that will be vegetated, including the number of trees planted or preserved, will be reported in square feet in the RAR.

## **APPENDIX 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**

**CONSTRUCTION  
HEALTH AND SAFETY PLAN  
FOR  
64-02 & 64-06 QUEENS BOULEVARD  
WOODSIDE, NEW YORK  
OER PROJECT NUMBER 15EHAN504Q**

**PREPARED FOR  
QUEENS BOULEVARD VENTURE, LLC**

**PREPARED BY**  
*FPM*group.  
**909 MARCONI AVENUE  
RONKONKOMA, NEW YORK 11779**

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**LIST OF ATTACHMENTS**

- A Materials Safety Data Sheets

## **SECTION 1.0 INTRODUCTION**

This Construction Health and Safety Plan (CHASP) has been written for compliance with "OSHA Hazardous Waste Operations Standards (29 CFR 1910.120)", the guidance documents, "Standard Operating Safety Guidelines (Office of Solid Waste and Emergency Response, 1988)" and the "Occupational Safety and Health Guidance Manual for Hazardous Waste Activities" (U.S. Department of Health and Human Services, 1985).

### **1.1 Scope and Applicability of the CHASP**

This CHASP is designed to be applicable to location(s) where the excavation of soil/fill will be performed at the Site. Dewatering is not anticipated at this time and is, therefore, not included herein. This CHASP may also be modified or amended to meet specific needs of the work proposed. This CHASP will detail the Site safety procedures, Site background, and safety monitoring. Contractors will be required to adopt this CHASP in full. A Health and Safety Officer (HSO) will be present at the Site to inspect the implementation of the CHASP. However, it is the sole responsibility of the contractor(s) to comply with the CHASP.

The CHASP has been formulated as a guide to complement professional judgment and experience. The appropriateness of the information presented should always be evaluated with respect to unforeseen Site conditions which may arise.

### **1.2 Site Work Zone and Visitors**

The Site work zone (a.k.a. exclusion zone) during excavation activities will be a 30-foot radius about the work location. This work zone may be extended if, in the judgment of the health and safety officer (HSO), Site conditions warrant a larger work zone.

No visitors will be permitted within the work zone without the consent of the HSO. All visitors will be required to be familiar with, and comply with, the CHASP. The HSO will deny access to those whose presence within the work zone is unnecessary or those who are deemed by the HSO to be in non-compliance with the CHASP.

All Site workers, including the contractors, who may directly contact Site soil will be required to have 40-hour hazardous material training (eight-hour refresher courses annually), respirator fit test certification if respirators are to be used, and medical surveillance as required in 29 CFR 1910.120.

The HSO will also give an on-Site health and safety discussion to all Site personnel, including the contractors, prior to initiating Site work involving soil. Workers not in attendance during the health and safety talk will be required to have the discussion with the HSO prior to entering the work zone.

Emergency telephone numbers and directions to the nearest hospital are found in Table 1.2.1.

**TABLE 1.2.1  
EMERGENCY TELEPHONE NUMBERS**

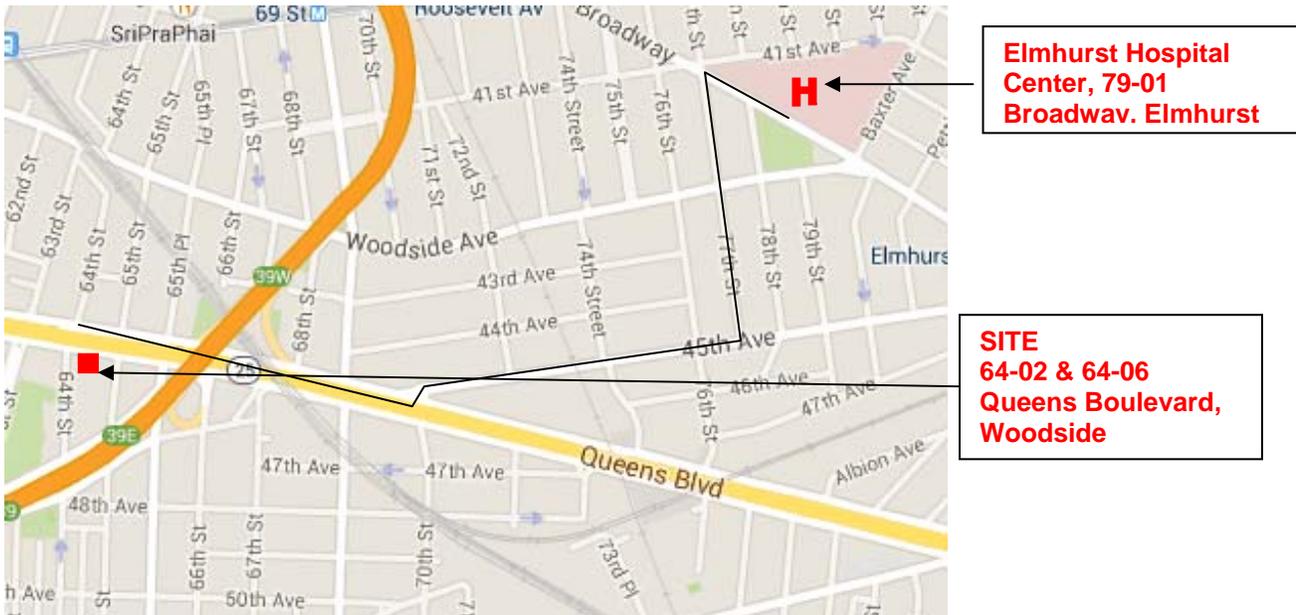
Police .....	911
Ambulance .....	911
Poison Control Center .....	212-764-7667
New York State Spills Hotline .....	800-457-7362
Elmhurst Hospital Center .....	718-334-4000

FPM Contact Personnel (631-737-6200)

Dr. Kevin J. Phillips, P.E. ....	Cell # 631-374-6066
Ben Cancemi, Project Manager and Health and Safety Officer .....	Cell # 516-383-7106
Stephanie Davis, Project Coordinator, QA/QC Officer .....	Cell # 516-381-3400
George Holmes, Alternate Health & Safety Officer .....	Cell # 631-512-1077

Directions to Elmhurst Hospital Center (718-334-4000)

Turn right from the north side of the Site onto Queens Boulevard and head east about one-half mile to 45<sup>th</sup> Avenue. Turn left onto 45<sup>th</sup> Avenue and continue east approximately one-half of a mile to 77<sup>th</sup> Street. Turn left onto 77<sup>th</sup> Street and continue north approximately one-quarter mile to Broadway. Turn right onto Broadway and continue approximately one-tenth mile. Elmhurst Hospital Center will be on the left.



## **SECTION 2.0 KEY PERSONNEL AND RESPONSIBILITIES**

The FPM project manager for this project will be Ben Cancemi. The FPM project field staff will include John Bukoski and George Holmes. Contractor personnel may also be on Site. The senior FPM staff member on Site will act as HSO and will report to the project manager. In the event that an FPM HSO is not present, an alternate qualified HSO will be appointed. Contractor personnel will be provided with health and safety information by the HSO and will be expected to follow this CHASP.

## **SECTION 3.0 SITE BACKGROUND**

### **3.1 Site History and Known Chemical Constituents at the Site**

The Site is located at 64-02 & 64-06 Queens Boulevard, Woodside, New York. The site is currently vacant and undeveloped. Soil/fill is present at the Site and is impacted with semivolatile organic compounds (SVOCs). Although no significantly-elevated levels were detected, concentrations of several SVOCs were noted to exceed Track 2 SCOs.

## SECTION 4.0 TASK/OPERATION HEALTH AND SAFETY ANALYSIS

This section will present health and safety analyses for the excavation of soil/fill.

### 4.1 Safety Analysis

Excavation of soil/fill will be performed by a contractor with oversight by FPM and/or the Site Supervisor. Excavation will involve the use of heavy equipment. Safety concerns will include risk of injury due to being struck by equipment, being trapped between moving equipment parts, being struck by dropped materials, and hearing damage due to equipment noise. Site personnel will take precautions against these risks when working in the vicinity of heavy equipment by being aware of equipment locations and movement, by wearing steel-toed boots and hard hats, and by using hearing protection, if necessary. Site personnel who have not previously worked in the vicinity of heavy equipment will be paired with an experienced person for at least one day to familiarize themselves with heavy equipment operations and safety procedures.

A calibrated photoionization detector (PID) will be used to monitor VOCs in the worker's breathing zone during excavation of petroleum-contaminated soils. Although previous onsite monitoring during intrusive activities has not indicated the presence of significant VOCs, steady-state PID readings greater than 10 ppm in the worker's breathing zone will require upgrading to Level C personal protective equipment. Steady-state readings, for this purpose, will be defined as readings between 10 and 20 parts per million (ppm) above background for a minimum of ten seconds. Readings will be obtained at points around and in proximity to the excavation area. These points will define the worker's breathing zone. Level C personal protection will include full-face air-purifying respirators with dust and organic vapor cartridges (personal protective equipment will be described in greater detail in Section 7.0). All FPM personnel and contractors within the potential to require respiratory protection must be properly trained and fit tested prior to donning respirators.

Upon encountering PID levels greater than 20 ppm above background in the worker's breathing zone, work will stop until the source of vapors is abated and readings are less than 20 ppm above background. If, at any time, PID readings exceed steady-state levels greater than 50 ppm above background, or any conditions exist which the HSO determines will require Level B personal protective equipment, all work at the Site will cease immediately and all personnel will evacuate the work zone. Evacuation will occur in the upwind direction if discernable. Level B conditions are not anticipated to be encountered; however, if level B conditions arise, no Site work will be performed by FPM or contractors and a complete evaluation of the operation will be performed and this CHASP will be modified.

All personnel who may directly contact soil will be required to wear chemical-resistant gloves (such as butyl or nitrile) when the potential for dermal contact with the soil is possible. Dermal contact with soils will be avoided.

Hard hats and steel-toe, steel-shank safety boots will be required when work is performed in the vicinity of heavy equipment (drill rigs, backhoes, etc.).

## 4.2 Other Safety Considerations

### 4.2.1 Noise

During excavation operations or any other operation that may generate potentially harmful levels of noise, the HSO will monitor noise levels with a Realistic™ hand-held sound level meter. Noise levels will be monitored in decibels (dBs) in the A-weighted, slow-response mode. Noise level readings that exceed the 29 CFR 1910.95 permissible noise exposure limits will require hearing protection (see Table 4.2.1.1 for permissible noise exposures).

Hearing protection will be available to all Site workers. The hearing protection will consist of foam, expansion-fit earplugs (or other approvable hearing protection) with an Environmental Protection Agency noise reduction rating of at least 29 dB. Hearing protection must alleviate worker exposure to noise to an eight-hour time-weighted average of 85 dB or below. In the event that the hearing protection is inadequate, work will cease until a higher level of hearing protection can be incorporated.

**TABLE 4.2.1.1  
PERMISSIBLE NOISE EXPOSURES\***

<u>Duration Per Day Hours</u>	<u>Sound Level dBA Slow Response</u>
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25	115

#### Notes:

When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions:  $C_1/T_1 + C_2/T_2 + C_6/T_6$  exceeds unity, then, the mixed exposure should be considered to exceed the limit value.  $C_n$  indicates the total time of exposure at a specified noise level, and  $T_n$  indicates the total time of exposure permitted at that level.

Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

\*Standards derived from 29 CFR 1910.95

#### 4.2.2 Slip/Trip/Fall Preventative Measures

To reduce the potential for slipping, tripping, or falling, the work zone will be kept clear of unnecessary equipment. All Site workers will be required to wear work boots with adequate tread to reduce the potential for slipping (work boots must be leather or chemical-resistant and contain steel toes and steel shanks).

#### 4.2.3 Insects and Ticks

Insect and tick problems are expected to be minimal. Potential insect problems include, but are not limited to, bees, wasps, and hornets. Prior to commencement of work, each work area will be surveyed for nests and hives to reduce the possibility of disturbing these insects. In addition, each Site worker will be asked to disclose any allergies related to insect stings or bites. The worker will be requested to keep his or her anti-allergy medicine on Site.

Tick species native to Long Island consist of the pinhead-sized deer tick and the much-larger dog tick. Due to a paucity of suitable habitat, ticks are not anticipated to be present at this site.

#### 4.2.4 Heat/Cold Stress

Heat stress may become a concern, especially if protective clothing is donned which will decrease natural ventilation. To assist in reducing heat stress the following measures will be taken:

- An adequate supply of water or other liquids will be brought on Site. To prevent dehydration, personnel will be encouraged to drink generous amounts of water even if not thirsty.
- A shady rest area will be designated (such as beneath the trees in the northeast corner of the property) to provide shelter during sunny days.
- In hot weather, workers wearing protective clothing may be rotated.

Indications of heat stress range from mild (fatigue, irritability, anxiety, decreased concentration, dexterity or movement) to fatal. Medical help will be obtained for serious conditions. Heat-related problems are:

- Heat rash: caused by continuous exposure to heat and humid air and aggravated by chafing clothes. Decreases ability to tolerate heat as well as being a nuisance.
- Heat cramps: caused by profuse perspiration with inadequate fluid intake and chemical replacement (especially salts). Signs: muscle spasm and pain in the extremities and abdomen.
- Heat exhaustion: caused by increased stress on various organs to meet increased demands to cool the body. Signs: shallow breathing; pale, cool, moist skin; profuse sweating; dizziness and lassitude.
- Heat stroke: the most severe form of heat stress. Can be fatal. Medical help must be obtained immediately. Body must be cooled immediately to prevent severe injury and/or death. Signs: red, hot, dry skin; no perspiration; nausea; dizziness and confusion; strong, rapid pulse; coma.

Cold exposure is a concern if work is conducted during cold weather or marginally cold weather during precipitation periods or moderate to high wind velocity periods. To assist in reducing cold exposure the following measures will be taken:

All personnel will be required to wear adequate and appropriate clothing. This will include head gear to prevent the high percentage loss of heat that occurs in this area (thermal liners for hard hats if hard hats are required).

- Provide a readily available warm shelter near each work zone.
- Carefully schedule work and rest periods to account for the current temperature and wind velocity conditions.
- Monitor work patterns and physical condition of workers and rotate personnel, as necessary.

Indications of cold exposure range from shivering, dizziness, numbness, confusion, weakness, impaired judgement, impaired vision to drowsiness. Medical help will be obtained for serious conditions if they occur. Cold exposure-related problems are:

- Frost bite: Ice crystal formation in body tissues. The restricted blood flow to the injured part results in local tissue destruction.
- Hypothermia: Severe exposure to cold temperature resulting in the body losing heat at a rate faster than the body can generate heat. The stages of hypothermia are shivering, apathy, loss of consciousness, decreasing pulse rate and breathing rate and death.

#### 4.2.5 Potential Electrical Hazards

Potential electric hazards consist primarily of underground and overhead power lines. Potential underground electrical hazards will be minimized by having a utility markout performed for the Site prior to any intrusive work. In addition, available as-built Site blueprints and owner knowledge will be used to avoid contact with subsurface utility lines or structures. Overhead electrical hazards will be evaluated by visually observing the work location prior to performing operations which have the potential to contact overhead utilities. No work shall be performed in close proximity to overhead utilities.

#### 4.2.6 The Buddy System

All activities in contaminated or potentially contaminated areas will be conducted by pairing off the Site workers in groups of two (or three if necessary). Each person (buddy) will be able to:

- Provide his or her partner with assistance.
- Observe his or her partner for signs of chemical or heat exposure.
- Periodically check the integrity of his or her partner's protective clothing.
- Notify the HSO or others if emergency help is needed.

The buddy system will be instituted at the beginning of each workday. If new workers arrive on Site, a buddy will be chosen prior to the new worker entering the work zone.

#### 4.2.7 Site Communications

Two sets of communication systems will be established at the Site: internal communication among personnel on-Site, and external communication between on-Site and off-Site personnel.

Internal communication will be used to:

- Alert team members to emergencies.
- Pass along safety information such as heat stress check, protective clothing check, etc.
- Communicate changes in the work to be accomplished.
- Maintain Site control.

An external communication system between on-Site and off-Site personnel will be established to:

- Coordinate emergency response
- Report to the Project Manager
- Maintain contact with essential off-Site personnel

A field telephone will be available at all times in the HSO's vehicle. In addition, the nearest stationary phone will be identified prior to the commencement of Site operations and this location will be relayed to all Site workers.

#### 4.2.8 General Safe Work Practices

Standing orders applicable during Site operations are as follows:

- No smoking, eating, drinking, or application of cosmetics in the work zone.
- No matches or lighters in the work zone.
- All Site workers will enter/exit work zone through the Site access point.
- Any signs of unusual conditions will require reporting the information to the HSO, who will take appropriate action.
- Loose fitting clothing or loose long hair will be prohibited in the work zone during drilling operations.
- A signal person will direct the backing of work vehicles.
- Equipment operators will be instructed to check equipment for abnormalities such as oozing liquids, frayed cables, unusual odors, etc.

## SECTION 5.0 PERSONNEL TRAINING REQUIREMENTS

All FPM personnel and contractor personnel will receive adequate training prior to entering the Site. FPM and contractor's personnel with the potential to contact Site soil will, at a minimum, have completed OSHA-approved, 40-hour hazardous materials Site safety training and OSHA-approved, eight-hour safety refresher course within one year prior to commencing field work. The HSO will have received the OSHA-approved, eight-hour course on managing hazardous waste operations. In addition, each worker must have a minimum of three days field experience under the direct supervision of a trained, experienced supervisor.

Prior to Site fieldwork, the HSO will conduct an in-house review of the project with respect to health and safety with all FPM personnel who will be involved with fieldwork at the Site. The review will include discussions of signs and symptoms of chemical exposure and heat stress that indicate potential medical emergencies presented in Table 5.1. In addition, review of personal protective equipment will be conducted, to include the proper use of air-purifying respirators.

**TABLE 5.1  
SIGNS AND SYMPTOMS OF EXPOSURE TO CHEMICALS**

Type of Hazard	Signs and Symptoms	
Chemical Hazard	Behavioral changes Breathing difficulties Changes in complexion of skin color Confusion Coordination difficulties Coughing Depression Dermatitis Dilated Pupils Dizziness Euphoria Fatigue and/or weakness Flushed face and/or neck Insomnia Irregular heartbeat Irritability	Irritation of eyes, nose, respiratory tract, skin or throat Headache Lacrimation Light-Headedness Muscle Fatigue Nausea Nervousness Numbness in limbs Paresthesia Sleepiness Tingling Tremors Vertigo Visual disturbance Vomiting
Heat Exhaustion	Clammy skin Confusion Dizziness Fainting Fatigue Heat rash	Light-headedness Nausea Profuse sweating Slurred speech Weak pulse
Heat Stroke (may be fatal)	Confusion Convulsions Hot skin, high temperature (yet may feel chilled)	Incoherent speech Staggering gait

## **SECTION 6.0 MEDICAL SURVEILLANCE PROGRAM**

All workers at the Site with the potential to contact Site soil must participate in a medical surveillance program in accordance with 29 CFR 1910.120. A medical examination and consultation must have been performed within the last twelve months to be eligible for Site work.

The content of the examination and consultation will include a medical and work history with special emphasis on symptoms related to the handling of hazardous substances, health hazards, and fitness for duty including the ability to wear required personal protective equipment under conditions (i.e., temperature extremes) that may be expected at the work Site. All medical examinations and procedures shall be performed by, or under the supervision of, a licensed physician.

The physician shall furnish a written opinion containing:

- The results of the medical examination and tests.
- The physician's opinion as to whether the employee has any detected medical conditions that would place the worker at increased risk of material impairment of the employee's health from work in hazardous waste operations.
- The physician's recommended limitations upon the worker assigned to the work.
- A statement that the worker has been informed by the physician of the results of the medical examination and any further examination or treatment.

An accurate record of the medical surveillance will be retained. The record will consist of at least the following information:

- The name and social security number of the employee.
- Physician's written opinions, recommended limitations, and results of examinations and tests.
- Any worker medical complaints related to exposure to hazardous substances.

## SECTION 7.0 PERSONAL PROTECTIVE EQUIPMENT

### 7.1 General Considerations

The two basic objectives of the personal protective equipment (PPE) are to protect the wearer from safety and health hazards, and to prevent the wearer from incorrect use and/or malfunction of the PPE.

Potential Site hazards were discussed previously in Section 4.0. The duration of Site activities for individual workers is estimated to be several days. All work is expected to be performed during daylight hours and workdays, in general, are expected to be eight to ten hours in duration. Any work performed beyond daylight hours will require the permission of the HSO. This decision will be based on the adequacy of artificial illumination and the type and necessity of the task being performed.

Personal protection levels for the Site activities, based on past investigations, are anticipated to be Level D with the possibility of upgrading to Level C. The equipment included for each level of protection is provided as follows:

#### Level C Protection

Personnel protective equipment:

- Air-purifying respirator, full-face
- Chemical-resistant clothing includes: Tyvek<sup>™</sup> (spunbonded olefin fibers) for particulate and limited splash protection or Saranex<sup>™</sup> (plastic film-laminated Tyvek) for permeation resistance to solvents.
- Coveralls\*, or
- Long cotton underwear\*
- Gloves (outer), chemical-resistant
- Gloves (inner), chemical-resistant
- Boots (outer), leather or chemical-resistant, steel toe and shank.
- Boot covers (outer), chemical-resistant (disposable)\*
- Hard hat (face shield)\*
- Escape mask\*
- 2-way radio communications (intrinsically safe)\*

(\* optional)

### Criteria for Selection of Level C Protection

Meeting all of these criteria permits use of Level C Protection:

- Oxygen concentrations are not less than 19.5% by volume.
- Measured air concentrations of identified substances will be reduced by the respirator below the substance's threshold limit value (TLV).
- Atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any body area left unprotected by chemical-resistant clothing.
- Job functions do not require self-contained breathing apparatus.
- Direct readings are below 50 ppm on the PID.

### Level D Protection

Personnel protective equipment:

- Coveralls
- Gloves
- Boots/shoes, leather or chemical-resistant, steel toe and shank.
- Safety glasses or chemical splash goggles\*
- Hard hat (face shield\*)
- Escape mask\*

(\* optional)

### Criteria for Selection of Level D Protection

Meeting any of these criteria allows use of Level D Protection:

- No contaminant levels above 5 ppm organic vapors and dusty conditions are present.
- Work functions preclude splashes, immersion, or the reasonable potential for unexpected inhalation of any chemicals above the TLV.

### Additional Considerations for Selecting Levels of Protection

Other factors which will be considered in selecting the appropriate level of protection are heat and physical stress. The use of protective clothing and respirators increases physical stress, in particular, heat stress on the wearer. Chemical protective clothing greatly reduces natural ventilation and diminishes the body's ability to regulate its temperature. Even in moderate ambient temperatures, the diminished capacity of the body to dissipate heat can result in one or more heat-related problems.

All chemical protective garments can be a contributing factor to heat stress. Greater susceptibility to heat stress occurs when protective clothing requires the use of a tightly fitted hood against the respirator face piece, or when gloves or boots are taped to the suit. As more body area is covered, less cooling takes place, increasing the probability of heat stress.

Wearing protective equipment also increases the risk of accidents. It is heavy, cumbersome, decreases dexterity, agility, interferes with vision, and is fatiguing to wear. These factors all increase physical stress and the potential for accidents. In particular, the necessity of selecting a level of protection will be balanced against the increased probability of heat stress and accidents.

## **7.2 Donning and Doffing Ensembles**

### **Donning an Ensemble**

A routine will be established and practiced periodically for donning a Level C ensemble. Assistance may be provided for donning and doffing since these operations are difficult to perform alone.

Table 7.2.1 lists sample procedures for donning a Level C ensemble. These procedures should be modified depending on the particular type of suit and/or when extra gloves and/or boots are used.

### **Doffing an Ensemble**

Exact procedures for removing Level C ensembles must be established and followed to prevent contaminant migration from the work area and transfer of contaminants to the wearer's body, the doffing assistant, and others.

Doffing procedures are provided in Table 7.2.2. These procedures should be performed only after decontamination of the suited worker. They require a suitably attired assistant. Throughout the procedures, both worker and assistant should avoid any direct contact with the outside surface of the suit.

## **7.3 Respirator Fit Testing**

The fit or integrity of the facepiece-to-face seal of a respirator affects its performance. Most facepieces fit only a certain percentage of the population; thus each facepiece must be tested on the potential wearer in order to ensure a tight seal. Facial features such as scars, hollow temples, very prominent cheekbones, deep skin creases, dentures or missing teeth, and the chewing of gum and tobacco may interfere with the respirator-to-face seal. A respirator shall not be worn when such conditions prevent a good seal. The worker's diligence in observing these factors shall be evaluated by periodic checks. Fit testing will comply with 29 CFR 1910.1025 regulations.

## **7.4 Inspection**

The PPE inspection program will entail five different inspections:

- Inspection and operational testing of equipment received from the factory or distributor.
- Inspection of equipment as it is issued to workers.
- Inspection after use.

**TABLE 7.2.1**  
**SAMPLE DONNING PROCEDURES**

---

1. Inspect the clothing and respiratory equipment before donning (see Inspection in subsection 7.4).
  2. Adjust hard hat or headpiece if worn, to fit user's head.
  3. Standing or sitting, step into the legs of the suit; ensure proper placement of the feet within the suit; then gather the suit around the waist.
  4. Put on chemical-resistant safety boots over the feet of the suit. Tape the leg cuff over the tops of the boots.
  5. Don the respirator and adjust it to be secure, but comfortable.
  6. Perform negative and positive respirator facepiece seal test procedures.
    - To conduct a negative-pressure test, close the inlet part with the palm of the hand or squeeze the breathing tube so it does not pass air, and gently inhale for about 10 seconds. Any inward rushing of air indicates a poor fit. Note that a leaking facepiece may be drawn tightly to the face to form a good seal, giving a false indication of adequate fit.
    - To conduct a positive-pressure test, gently exhale while covering the exhalation valve to ensure that a positive pressure can be built up. Failure to build a positive pressure indicates a poor fit.
  7. Depending on type of suit:
    - Put on inner gloves (surgical gloves).
    - Additional overgloves, worn over attached suit gloves, may be donned later.
  8. Put on hard hat
  9. Have assistant observe the wearer for a period of time to ensure that the wearer is comfortable, psychologically stable, and that the equipment is functioning properly.
-

**TABLE 7.2.2  
DOFFING PROCEDURES**

---

1. Remove any extraneous or disposable clothing, boot covers, outer gloves, and tape.
  2. Remove respirator by loosening straps and pulling straps over the top of the head and move mask away from head. Do not pull mask over the top of the head.
  3. Remove arms, one at a time, from suit, avoiding any contact between the outside surface of the suit and wearer's body and lay the suit out flat behind the wearer. Leave internal gloves on, if any.
  4. Sitting, if possible, remove both legs from the suit.
  5. After suit is removed, remove internal gloves by rolling them off the hand, inside out.
- 

- Periodic inspection of stored equipment.
- Periodic inspection when a question arises concerning the appropriateness of the selected equipment, or when problems with similar equipment arise.

The inspection checklist is provided in Table 7.4.1.

**TABLE 7.4.1  
PPE INSPECTION CHECKLIST**

---

**CLOTHING**

**Before use:**

- Determine that the clothing material is correct for the specified task at hand.
- Visually inspect for:
  - imperfect seams
  - non-uniform coatings
  - tears
  - malfunctioning closures
- Hold up to light and check for pinholes.
- Flex product:
  - Observe for cracks
  - Observe for other signs of shelf deterioration
  -
- If the product has been used previously, inspect inside and out for signs of chemical attack:
  - discoloration
  - swelling
  - stiffness

**TABLE 7.4.1 (CONTINUED)  
PPE INSPECTION CHECKLIST**

---

- If the product has been used previously, inspect inside and out for signs of chemical attack:
  - discoloration
  - swelling
  - stiffness

During the work task, periodically inspect for:

- Evidence of chemical attack such as discoloration, swelling, stiffening, and softening. Keep in mind, however, that chemical permeation can occur without any visible effects.
- Closure failure
- Tears
- Punctures
- Seam discontinuities

**GLOVES**

Before use:

- Pressurize glove to check for pinholes. Either blow into glove, then roll gauntlet toward fingers or inflate glove and hold under water. In either case, no air should escape.

**AIR-PURIFYING RESPIRATORS**

- Inspect air-purifying respirators:
  - before each use to be sure they have been adequately cleaned
- Check material conditions for:
  - signs of pliability
  - signs of deterioration
  - signs of distortion
- Examine cartridges to ensure that:
  - they are the proper type for the intended use
  - the expiration date has not been passed
  - they have not been opened or used previously
- Check faceshields and lenses for:
  - cracks
  - crazing
  - fogginess
- Air purifying respirators will be stored individually in re-sealable plastic bags.

---

**7.5 Storage**

Clothing and respirators will be stored properly to prevent damage or malfunction due to exposure to dust, moisture, sunlight, damaging chemicals, extreme temperatures, and impact. Storage procedures are as follows:

### Clothing:

- Potentially contaminated clothing will be stored in an area separate from street clothing.
- Potentially contaminated clothing will be stored in a well-ventilated area, with good air flow around each item, if possible.
- Different types and material of clothing and gloves will be stored separately to prevent issuing the wrong material by mistake.
- Protective clothing will be folded or hung in accordance with manufacturer's recommendations.

### Respirators:

- Air-purifying respirators should be dismantled, washed, and placed in sealed plastic bags.

## **7.6 Maintenance**

Specialized maintenance will be performed only by the factory or an authorized repair person. Routine maintenance, such as cleaning, will be performed by the personnel to whom the equipment is assigned. Respirators will be cleaned at the end of each day with alcohol pads or, preferably, by washing with warm soapy water.

## **7.7 Decontamination Methods**

All personnel, clothing, equipment, and samples leaving the contaminated (work zone) area of the Site must be decontaminated to remove any harmful chemicals that may have adhered to them. Decontamination methods either (1) physically remove contaminants (2) inactivate contaminants by chemical detoxification or disinfection/sterilization, or (3) remove contaminants by a combination of both physical and chemical means. In many cases, gross contamination can be removed by physical means involving dislodging/displacement, rinsing, wiping off, and evaporation. Contaminants that can be removed by physical means include dust, vapors, and volatile liquids. All reusable equipment will be decontaminated by rinsing in a bath of detergent and water (respirators, gloves to be reused). Monitoring equipment will be decontaminated by wiping with paper towels and water.

The effectiveness of the decontamination will be evaluated near the beginning of Site activities and will be modified if determined to be ineffective. Visual observation will be used for this purpose. The HSO will inspect decontaminated materials for discoloration, stains, corrosive effects, visible dirt, or other signs of possible residual contamination.

All disposable PPE will be discarded following use. All used PPE to be discarded will be placed in an appropriate receptacle for disposal.

## **SECTION 8.0**

### **DECONTAMINATION PROCEDURES FOR SAMPLING AND EXCAVATION EQUIPMENT**

All non-dedicated sampling equipment shall be decontaminated prior to, and following, use at each sampling location. Decontamination procedures shall consist of the following:

1. Scrub equipment in a bath of low-phosphate detergent and potable water.
2. Potable water rinse.
3. Air dry.
4. Aluminum foil wrap, shiny side out, for transport.

Personal protective equipment decontamination has been discussed in Subsection 7.7.

All excavation equipment that has contacted Site soil will be decontaminated prior to leaving the Site. Decontamination of this equipment will consist of physically removing adhering soil using hand tools followed by rinsing the equipment with potable water. Decontamination will be performed in the immediate vicinity of the work area so that the removed soil and rinseate will be discharged in the area from which it originated.

## **SECTION 9.0 CALIBRATION PROCEDURES, FREQUENCIES, AND MAINTENANCE**

This section will present the calibration procedures, frequencies, and maintenance for the health and safety field monitoring instruments. The use of the monitoring equipment is presented as follows (the manufacturer's owner's manuals for all equipment used will be present at the Site):

1. Photovac MicroTIP - this instrument is a photoionization detector (PID) that measures the concentration of airborne ionizable gases and vapors. The MicroTIP does not distinguish between individual compounds and will not read methane. The calibration will be performed using ambient air to "zero" the instrument and a 95 ppm cylinder of isobutylene to calibrate the span. The calibration will be performed as follows:
  - a. Connect the supplied regulator to the Span Gas cylinder. Hand-tighten the fittings.
  - b. Open the valve on the gas bag by turning the valve stem fully counter clockwise.
  - c. Attach the gas bag adapter nut to the regulator. Hand-tighten the fittings.
  - d. Turn the regulator knob counter clockwise about half turn to start the flow of gas.
  - e. Fill the gas bag about half full and then close the regulator fully clockwise to turn off the flow of gas.
  - f. Disconnect the bag from the adapter and empty it. Flush the bag a few times with the Span Gas and then fill it.
  - g. Close the gas bag by turning the valve clockwise.
  - h. Press SETUP and select the desired Cal Memory with arrow keys and press ENTER. Press EXIT to leave Setup.
  - i. Press CAL and expose MicroTIP to ambient air. Press ENTER and MicroTIP sets its zero point.
  - j. MicroTIP then asks for the Span Gas concentration. Enter the Known Span Gas concentration and then connect the Span Gas bag adapter to the inlet.
  - k. Press ENTER and MicroTIP sets its sensitivity.
  - l. When MicroTIP's display reverts to normal, MicroTIP is calibrated and ready for use. Remove the Span Gas bag from the inlet.

The instrument will be calibrated prior to the commencement of each day's work. The instrument will be charged overnight prior to each day's work.

## **SECTION 10.0 EMERGENCY RESPONSE PLAN**

This section will present the Emergency Response Plan (ERP) for the Site. Pre-emergency planning will consist of reviewing the ERP with all workers at the Site prior to initiation of work.

### Personnel Roles

It is anticipated that during excavation activities at the Site, in general, several persons will be on the Site: the HSO and contractors. Should an emergency situation arise at the Site, the HSO will assume control and decision-making. The HSO will also resolve all disputes concerning health and safety requirements and precautions. The HSO will also:

- Be authorized to seek and purchase supplies as necessary.
- Have control over activities of everyone entering the Site.

The HSO will communicate with off-Site personnel, including the Project Manager, to evaluate data and assist in the decision-making process. Phone numbers for the fire department, police, ambulance, poison control center, NYC Department of Environmental Protection, and NYS Department of Environmental Conservation Spill Response Department are listed in Table 1.2.1 of this document. The hospital that will be utilized during an emergency will be the Elmhurst Hospital Center. The directions to the hospital, along with the hospital's emergency room phone number are presented in Table 1.2.1. Copies of Table 1.2.1 will be available at the Site and will be placed in vehicles of personnel involved in soil activities at the Site.

### Response Follow-Up

Following an emergency, or incident, a detailed report will be generated by the HSO. All equipment will be restored to pre-emergency conditions. The CHASP will be reviewed following an emergency to determine if it provides adequate information to assist in dealing with the emergency. The CHASP may be revised to incorporate additional information as needed.

### Emergency Recognition and Prevention

Before daily work assignments begin, each day a brief on-Site meeting will be held by the HSO to address health and safety issues related to the day's work. Prior to initiation of work, a detailed on-Site health and safety meeting will be held to review all potential hazards, contingencies, and safety measures.

### Safe Distances and Places of Refuge

The main potential cause of work zone evacuation is a significant vapor release. Vapor release evacuation will be discussed prior to subsurface activities at the Site and in general will be in the upwind direction. Wind direction will be monitored at each work location and all workers will be notified of the direction of evacuation prior to commencement of work. Safe distances will be discussed at each location and determined by the HSO. The PID will be used to determine if workers have evacuated a sufficient distance.

At all times, vehicles which may be utilized in an emergency for transport to the hospital (or other destination) will have clear access to leave the Site. The HSO will assure that an emergency vehicle does not become blocked-in by other vehicles.

#### Site Security and Control

The HSO will control entry of personnel into the work zone. No unnecessary persons shall be permitted in the work zone.

#### Decontamination Procedures During Emergencies

In the event of a medical emergency, decontamination will be performed if it does not interfere with essential treatment. Decontamination will be performed by washing, rinsing, and/or cutting off protective clothing and equipment.

If decontamination cannot be performed, the victim will be wrapped in plastic to reduce contamination to other personnel. Emergency and off-Site medical personnel will be alerted to the potential contamination.

#### Emergency Medical Treatment and First Aid

Medical emergencies will be treated, in general, by medical experts by transporting the victim to the nearby hospital. A first aid kit will be present on Site for minor medical treatment.

**ATTACHMENT A**  
**MATERIALS SAFETY DATA SHEETS**



MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

EMERGENCY OVERVIEW

DANGER!

**EXTREMELY FLAMMABLE - EYE AND MUCOUS MEMBRANE IRRITANT  
- EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF  
SWALLOWED - ASPIRATION HAZARD**



NFPA 704 (Section 16)

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Harmful if absorbed through the skin. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.

1. CHEMICAL PRODUCT and COMPANY INFORMATION

Hess Corporation  
1 Hess Plaza  
Woodbridge, NJ 07095-0961

EMERGENCY TELEPHONE NUMBER (24 hrs):

COMPANY CONTACT (business hours):

MSDS (Environment, Health, Safety) Internet Website

CHEMTREC (800)424-9300

Corporate Safety (732)750-6000

www.hess.com

**SYNONYMS:** Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and INFORMATION ON INGREDIENTS \*

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Gasoline (86290-81-5)	100
Benzene (71-43-2)	0.1 - 4.9 (0.1 - 1.3 reformulated gasoline)
n-Butane (106-97-8)	< 10
Ethyl Alcohol (Ethanol) (64-17-5)	0 - 10
Ethyl benzene (100-41-4)	< 3
n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Tertiary-amyl methyl ether (TAME) (994-05-8)	0 to 17.2
Toluene (108-88-3)	1 - 25
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 - 15

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol or MTBE and/or TAME).



## MATERIAL SAFETY DATA SHEET

**Gasoline, All Grades**

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Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

### 3. HAZARDS IDENTIFICATION

#### **EYES**

Moderate irritant. Contact with liquid or vapor may cause irritation.

#### **SKIN**

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

#### **INGESTION**

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

#### **INHALATION**

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

**WARNING:** the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

#### **CHRONIC EFFECTS and CARCINOGENICITY**

Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with systemic toxicity. See also Section 11 - Toxicological Information.

#### **MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE**

Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Chronic respiratory disease, liver or kidney dysfunction, or pre-existing central nervous system disorders may be aggravated by exposure.

### 4. FIRST AID MEASURES

#### **EYES**

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

#### **SKIN**

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops.

#### **INGESTION**



## MATERIAL SAFETY DATA SHEET

**Gasoline, All Grades**

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DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

### **INHALATION**

Remove person to fresh air. If person is not breathing, ensure an open airway and provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

## **5. FIRE FIGHTING MEASURES**

### **FLAMMABLE PROPERTIES:**

FLASH POINT:	-45 °F (-43°C)
AUTOIGNITION TEMPERATURE:	highly variable; > 530 °F (>280 °C)
OSHA/NFPA FLAMMABILITY CLASS:	1A (flammable liquid)
LOWER EXPLOSIVE LIMIT (%):	1.4%
UPPER EXPLOSIVE LIMIT (%):	7.6%

### **FIRE AND EXPLOSION HAZARDS**

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

### **EXTINGUISHING MEDIA**

**SMALL FIRES:** Any extinguisher suitable for Class B fires, dry chemical, CO<sub>2</sub>, water spray, fire fighting foam, or Halon.

**LARGE FIRES:** Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

During certain times of the year and/or in certain geographical locations, gasoline may contain MTBE and/or TAME. Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration - refer to NFPA 11 "Low Expansion Foam - 1994 Edition."

### **FIRE FIGHTING INSTRUCTIONS**

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.



## MATERIAL SAFETY DATA SHEET

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### **6. ACCIDENTAL RELEASE MEASURES**

ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal - caution, flammable vapors may accumulate in closed containers. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

### **7. HANDLING and STORAGE**

#### **HANDLING PRECAUTIONS**

\*\*\*\*\*USE ONLY AS A MOTOR FUEL\*\*\*\*\*

\*\*\*\*\*DO NOT SIPHON BY MOUTH\*\*\*\*\*

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents.

#### **STORAGE PRECAUTIONS**

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

#### **WORK/HYGIENIC PRACTICES**

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use solvents or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.



## MATERIAL SAFETY DATA SHEET

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### 8. EXPOSURE CONTROLS and PERSONAL PROTECTION

#### EXPOSURE LIMITS

Component (CAS No.)	Source	TWA (ppm)	STEL (ppm)	Exposure Limits	Note
Gasoline (86290-81-5)	ACGIH	300	500	A3	
Benzene (71-43-2)	OSHA	1	5	Carcinogen	
	ACGIH	0.5	2.5	A1, skin	
	USCG	1	5		
n-Butane (106-97-8)	ACGIH	1000	--	Aliphatic Hydrocarbon Gases Alkane (C1-C4)	
Ethyl Alcohol (ethanol) (64-17-5)	OSHA	1000	--		
	ACGIH	1000	--	A4	
Ethyl benzene (100-41-4)	OSHA	100	--		
	ACGIH	100	125	A3	
n-Hexane (110-54-3)	OSHA	500	--		
	ACGIH	50	--	Skin	
Methyl-tertiary butyl ether [MTBE] (1634-04-4)	ACGIH	50	--	A3	
Tertiary-amyl methyl ether [TAME] (994-05-8)				None established	
Toluene (108-88-3)	OSHA	200	--	Ceiling: 300 ppm; Peak: 500 ppm (10 min.)	
	ACGIH	20	--	A4	
1,2,4-Trimethylbenzene (95-63-6)	ACGIH	25	--		
Xylene, mixed isomers (1330-20-7)	OSHA	100	--		
	ACGIH	100	150	A4	

#### ENGINEERING CONTROLS

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

#### EYE/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

#### SKIN PROTECTION

Gloves constructed of nitrile or neoprene are recommended. Chemical protective clothing such as that made of of E.I. DuPont Tychem®, products or equivalent is recommended based on degree of exposure.

Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

#### RESPIRATORY PROTECTION

A NIOSH-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection and limitations.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

### 9. PHYSICAL and CHEMICAL PROPERTIES

#### APPEARANCE

A translucent, straw-colored or light yellow liquid



## MATERIAL SAFETY DATA SHEET

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### ODOR

A strong, characteristic aromatic hydrocarbon odor. Oxygenated gasoline with MTBE and/or TAME may have a sweet, ether-like odor and is detectable at a lower concentration than non-oxygenated gasoline.

### ODOR THRESHOLD

	<u>Odor Detection</u>	<u>Odor Recognition</u>
Non-oxygenated gasoline:	0.5 - 0.6 ppm	0.8 - 1.1 ppm
Gasoline with 15% MTBE:	0.2 - 0.3 ppm	0.4 - 0.7 ppm
Gasoline with 15% TAME:	0.1 ppm	0.2 ppm

### BASIC PHYSICAL PROPERTIES

BOILING RANGE:	85 to 437 °F (39 to 200 °C)
VAPOR PRESSURE:	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)
VAPOR DENSITY (air = 1):	AP 3 to 4
SPECIFIC GRAVITY (H <sub>2</sub> O = 1):	0.70 - 0.78
EVAPORATION RATE:	10-11 (n-butyl acetate = 1)
PERCENT VOLATILES:	100 %
SOLUBILITY (H <sub>2</sub> O):	Non-oxygenated gasoline - negligible (< 0.1% @ 77 °F). Gasoline with 15% MTBE - slight (0.1 - 3% @ 77 °F); ethanol is readily soluble in water

## **10. STABILITY and REACTIVITY )**

**STABILITY:** Stable. Hazardous polymerization will not occur.

### CONDITIONS TO AVOID

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources

### INCOMPATIBLE MATERIALS

Keep away from strong oxidizers.

### HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitroresols that can decompose violently.

## **11. TOXICOLOGICAL PROPERTIES**

### ACUTE TOXICITY

Acute Dermal LD50 (rabbits): > 5 ml/kg	Acute Oral LD50 (rat): 18.75 ml/kg
Primary dermal irritation (rabbits): slightly irritating	Draize eye irritation (rabbits): non-irritating
Guinea pig sensitization: negative	

### CHRONIC EFFECTS AND CARCINOGENICITY

Carcinogenicity: OSHA: NO IARC: YES - 2B NTP: NO ACGIH: YES (A3)

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.



MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

This product may contain methyl tertiary butyl ether (MTBE ): animal and human health effects studies indicate that MTBE may cause eye, skin, and respiratory tract irritation, central nervous system depression and neurotoxicity. MTBE is classified as an animal carcinogen (A3) by the ACGIH.

12. ECOLOGICAL INFORMATION

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations. If released, oxygenates such as ethers and alcohols will be expected to exhibit fairly high mobility in soil, and therefore may leach into groundwater. The API (www.api.org) provides a number of useful references addressing petroleum and oxygenate contamination of groundwater.

13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: Gasoline
DOT HAZARD CLASS and PACKING GROUP: 3, PG II
DOT IDENTIFICATION NUMBER: UN 1203
DOT SHIPPING LABEL: FLAMMABLE LIQUID

PLACARD:



15. REGULATORY INFORMATION

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory. Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

Table with 5 columns: ACUTE HEALTH, CHRONIC HEALTH, FIRE, SUDDEN RELEASE OF PRESSURE, REACTIVE. Values: X, X, X, --, --

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

Table with 2 columns: INGREDIENT NAME (CAS NUMBER), CONCENTRATION WT. PERCENT. Rows: Benzene (71-43-2) 0.1 to 4.9 (0.1 to 1.3 for reformulated gasoline), Ethyl benzene (100-41-4) < 3



MATERIAL SAFETY DATA SHEET

Gasoline, All Grades

MSDS No. 9950

n-Hexane (110-54-3)	0.5 to 4
Methyl-tertiary butyl ether (MTBE) (1634-04-4)	0 to 15.0
Toluene (108-88-3)	1 to 15
1,2,4- Trimethylbenzene (95-63-6)	< 6
Xylene, mixed isomers (1330-20-7)	1 to 15

US EPA guidance documents ([www.epa.gov/tri](http://www.epa.gov/tri)) for reporting Persistent Bioaccumulating Toxics (PBTs) indicate this product may contain the following deminimis levels of toxic chemicals subject to Section 313 reporting:

<u>INGREDIENT NAME (CAS NUMBER)</u>	<u>CONCENTRATION - Parts per million (ppm) by weight</u>
Polycyclic aromatic compounds (PACs)	17
Benzo (g,h,i) perylene (191-24-2)	2.55
Lead (7439-92-1)	0.079

**CALIFORNIA PROPOSITION 65 LIST OF CHEMICALS**

This product contains the following chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

<u>INGREDIENT NAME (CAS NUMBER)</u>	<u>Date Listed</u>
Benzene	2/27/1987
Ethyl benzene	6/11/2004
Toluene	1/1/1991

**CANADIAN REGULATORY INFORMATION (WHMIS)**

Class B, Division 2 (Flammable Liquid)  
Class D, Division 2A (Very toxic by other means) and Class D, Division 2B (Toxic by other means)

**16. OTHER INFORMATION**

<b><u>NFPA® HAZARD RATING</u></b>	HEALTH:	1	Slight
	FIRE:	3	Serious
	REACTIVITY:	0	Minimal
<b><u>HMIS® HAZARD RATING</u></b>	HEALTH:	1 *	Slight
	FIRE:	3	Serious
	PHYSICAL:	0	Minimal

\* CHRONIC

**SUPERSEDES MSDS DATED: 07/01/06**

**ABBREVIATIONS:**

AP = Approximately    < = Less than    > = Greater than  
N/A = Not Applicable    N/D = Not Determined    ppm = parts per million

**ACRONYMS:**

ACGIH	American Conference of Governmental Industrial Hygienists	CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
AIHA	American Industrial Hygiene Association	DOT	U.S. Department of Transportation
ANSI	American National Standards Institute (212)642-4900		[General Info: (800)467-4922]
API	American Petroleum Institute (202)682-8000	EPA	U.S. Environmental Protection Agency
		HMIS	Hazardous Materials Information System



## MATERIAL SAFETY DATA SHEET

**Gasoline, All Grades**

**MSDS No. 9950**

IARC	International Agency For Research On Cancer	REL	Recommended Exposure Limit (NIOSH)
MSHA	Mine Safety and Health Administration	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
NFPA	National Fire Protection Association (617)770-3000	SCBA	Self-Contained Breathing Apparatus
NIOSH	National Institute of Occupational Safety and Health	SPCC	Spill Prevention, Control, and Countermeasures
NOIC	Notice of Intended Change (proposed change to ACGIH TLV)	STEL	Short-Term Exposure Limit (generally 15 minutes)
NTP	National Toxicology Program	TLV	Threshold Limit Value (ACGIH)
OPA	Oil Pollution Act of 1990	TSCA	Toxic Substances Control Act
OSHA	U.S. Occupational Safety & Health Administration	TWA	Time Weighted Average (8 hr.)
PEL	Permissible Exposure Limit (OSHA)	WEEL	Workplace Environmental Exposure Level (AIHA)
RCRA	Resource Conservation and Recovery Act	WHMIS	Workplace Hazardous Materials Information System (Canada)

### DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.



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# Polycyclic Aromatic Hydrocarbons (PAHs)

## What are PAHs?

Short for polycyclic aromatic hydrocarbons, PAHs describe chemicals that are often found together in groups of two or more. PAHs are found naturally in the environment but they can also be man-made. In their purest form, PAHs are solid and range in appearance from colorless to white or pale yellow-green. PAHs are created when products like coal, oil, gas, and garbage are burned but the burning process is not complete. Although PAHs can exist in over 100 different combinations, the National Waste Minimization Program defines this group using the Toxic Release Inventory reporting category for polycyclic aromatic compounds.

Chemicals included in this category, by name and CAS number, are:

1. Benzo(a)anthracene, 56-55-3
2. Benzo(a)phenanthrene (chrysene), 218-01-9
3. Benzo(a)pyrene, 50-32-8
4. Benzo(b)fluoranthene, 205-99-2
5. Benzo(j)fluoranthene, 205-82-3
6. Benzo(k)fluoranthene, 207-08-9
7. Benzo(j,k)fluorene (fluoranthene), 206-44-0
8. Benzo(r,s,t)pentaphene, 189-55-9
9. Dibenz(a,h)acridine, 226-36-8
10. Dibenz(a,j)acridine, 224-42-0
11. Dibenzo(a,h)anthracene, 53-70-3
12. Dibenzo(a,e)fluoranthene, 5385-75-1
13. Dibenzo(a,e)pyrene, 192-65-4
14. Dibenzo(a,h)pyrene, 189-64-0
15. Dibenzo(a,l)pyrene, 191-30-0
16. 7H-Dibenzo(c,g)carbazole, 194-59-2
17. 7,12-Dimethylbenz(a)anthracene, 57-97-6
18. Indeno(1,2,3-cd)pyrene 193-39-5
19. 3-Methylcholanthrene, 56-49-5
20. 5-Methylchrysene, 3697-24-3

21. 1-Nitropyrene, 5522-43-0

It should be noted that some PAHs are listed individually on EPA's Priority Chemical list. They are:

1. Acenaphthene, 83-32-9
2. Acenaphthylene, 208-96-8
3. Anthracene, 120-12-7
4. Benzo(g,h,i)perylene, 191-24-2
5. Fluorene, 86-73-7
6. Phenanthrene, 85-01-8
7. Pyrene, 129-00-0

## Why are PAHs bad actors?

PAHs are a concern because they are persistent. Because they do not burn very easily, they can stay in the environment for long periods of time. Individual PAHs vary in behavior. Some can turn into a vapor in the air very easily. Most do not break down easily in the water.

## What are PAHs used for?

Most PAHs are used to conduct research. However, some PAHs are used to make dyes, plastics, and pesticides. Some are even used in medicines.

## How can PAHs enter and leave your body?

One of the most common ways PAHs can enter the body is through breathing contaminated air. PAHs get into your lungs when you breathe them. If you live near a hazardous waste site where PAHs are disposed, you are likely to breathe PAHs. If you eat or drink food and water contaminated with PAHs, you could be

exposed. Exposure to PAHs can also occur if your skin contacts PAH-contaminated soil or products like heavy oils, coal tar, roofing tar, or creosote. Creosote is an oily liquid found in coal tar and is used to preserve wood. Once in your body, PAHs can spread and target fat tissues. Target organs include the kidneys and liver. However, PAHs will leave your body through urine and feces in a matter of days.

### **How can you be exposed to PAHs?**

You can be exposed to PAHs in the environment, in your home, and in the workplace. Because PAHs exist naturally in the environment and are man-made, you can be exposed in a number of ways. Fumes from vehicle exhaust, coal, coal tar, asphalt, wildfires, agricultural burning and hazardous waste sites are all sources of exposure.

You could be exposed to PAHs by breathing cigarette and tobacco smoke, eating foods grown in contaminated soil, or by eating meat or other food that you grilled. Grilling and charring food actually increases the amount of PAHs in the food.

If you work in a plant that makes coal tar, asphalt and aluminum, or that burns trash, you can be exposed to PAHs. You can also be exposed if you work in a facility that uses petroleum or coal, or where wood, corn, and oil are burned.

### **How can PAHs affect your health?**

A number of PAHs have caused tumors in laboratory animals that were exposed to PAHs through their food, from breathing contaminated air, and when it was applied to their skin. When pregnant mice ate high doses of a PAH (benzo(a)pyrene) they experienced reproductive problems. In addition, the offspring of the pregnant mice showed birth defects and a decrease in their body weight. Other effects include damage to the skin, body fluids, and the immune system. However, these effects have not been seen in humans.

### **Is there a medical test to determine if you have been exposed to PAHs?**

There is a test that can measure the presence of PAH in your urine. This test can only tell you if you have been exposed; but it can't reveal how harmful the effects of the exposure will be. This test would have to be performed in a laboratory that has special equipment to detect the PAHs. Another test currently being developed will be able to measure PAHs in your body tissue and blood.

### **What are the medical treatments in cases of exposure?**

Most exposures to PAHs happen every day at very low levels in the air we breathe and the foods we eat. Treatment for a short-term exposure is unlikely. Contact your doctor if you experience symptoms of PAHs poisoning.

### **What levels of exposure have resulted in harmful health effects?**

There is no information available from studies on humans to tell what effects can result from being exposed to individual PAHs at certain levels. However, breathing PAHs and skin contact seem to be associated with cancer in humans. Animal studies showed that mice exposed to 308 parts per million (ppm) of PAHs (specifically benzo (a) pyrene) in food for 10 days (short term exposure) caused birth defects. Mice exposed to 923 ppm of benzo (a) pyrene in food for months caused problems in the liver and blood.

### **Where can I get more information?**

Contact your state health or environmental department, or:

Agency for Toxic Substances and Disease Registry  
Division of Toxicology  
1600 Clifton Road, N.E., E-29  
Atlanta, Georgia 30333

### **References**

1. Agency for Toxic Substances and Disease

Registry (ATSDR), Public Health Statement, *Polycyclic Aromatic Hydrocarbons*, December 1990. U.S. Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA, December 1990.

2. United States Environmental Protection Agency, Office of Environmental Information, *Emergency Planning and Community Right-to-Know Act – Section 313: Guidance for Reporting Toxic Chemicals: Polycyclic Aromatic Compounds Category*, EPA 260-B-01-03, Washington, DC, August 2001.

## **APPENDIX 6**

### **MANUFACTURER SPECIFICATIONS AND DESIGN DRAWINGS FOR THE VAPOR BARRIER AND COMPOSITE COVER SYSTEM**

# Grace Below Grade Waterproofing

## PREPRUFE® 300R & 160R

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

### Description

Preprufe® 300R & 160R membranes are unique composite sheets comprised of a thick HDPE film, pressure sensitive adhesive and weather resistant protective coating. Designed with Advanced Bond Technology™, Preprufe 300R & 160R membranes form a unique, integral bond to poured concrete, preventing both the ingress and lateral migration of water while providing a robust barrier to water, moisture and gas.

The Preprufe R System includes:

- **Preprufe® 300R**—heavy-duty grade for use below slabs and on rafts (i.e. mud slabs). Designed to accept the placing of heavy reinforcement using conventional concrete spacers.
- **Preprufe® 160R**—thinner grade for blindside, zero property line applications against soil retention systems. Vertical use only.
- **Preprufe® Tape LT**—for covering cut edges, roll ends, penetrations and detailing (temperatures between 25°F (-4°C) and 86°F (+30°C)).
- **Preprufe® Tape HC**—for covering cut edges, roll ends, penetrations and detailing (minimum 50°F (10°C)).
- **Preprufe® CJ Tape LT**—for construction joints, and detailing (temperatures between 25°F (-4°C) and 86°F (+30°C)).
- **Preprufe® CJ Tape HC**—for construction joints, and detailing (minimum 50°F (10°C)).
- **Bituthene® Liquid Membrane**—for sealing around penetrations, etc.
- **Adcor™ ES**—waterstop for joints in concrete walls and floors
- **Preprufe® Tieback Covers**—preformed cover for soil retention wall tieback heads
- **Preprufe® Preformed Corners**—preformed inside and outside corners

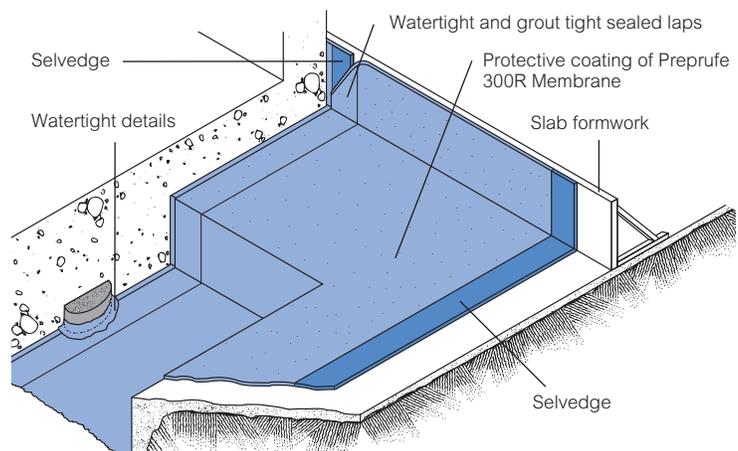
Preprufe® 300R & 160R membranes are applied either horizontally to smooth prepared concrete, carton forms or well rolled and compacted earth or crushed stone substrate; or vertically to permanent formwork or adjoining structures. Concrete is then cast directly against the adhesive side of the membranes.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

Preprufe® products can be returned up the inside face of

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

### Advantages

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



Drawings are for illustration purposes only.  
Please refer to [graceconstruction.com](http://graceconstruction.com) for specific application details.

- not reliant on confining pressures or hydration
- unaffected by wet/dry cycling
- **Chemical resistant**—effective in most types of soils and waters, protects structure from salt or sulphate attack

## Installation

The most current application instructions, detail drawings and technical letters can be viewed at [graceconstruction.com](http://graceconstruction.com). For other technical information contact your local Grace representative.

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

### Substrate Preparation

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

**Horizontal**—The substrate must be free of loose aggregate and sharp protrusions. Avoid curved or rounded substrates. When installing over earth or crushed stone, ensure substrate is well compacted to avoid displacement of substrate due to traffic or concrete pour. The surface does not need to be dry, but standing water must be removed.

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

### Membrane Installation

Preprufe® membranes can be applied at temperatures of 25°F (-4°C) or above. When installing Preprufe product in cold or marginal weather conditions 55°F (<13°C) the use of Preprufe Tape LT is recommended at all laps and detailing. Preprufe Tape LT should be applied to clean, dry surfaces and the release liner must be removed immediately after application. Alternatively, Preprufe Low Temperature (LT) membrane is available for low temperature condition applications. Refer to Preprufe LT data sheet and Grace Tech Letter 16 for more information.

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

Accurately position succeeding sheets to overlap the previous sheet 3 in. (75 mm) along the marked selvedge. Ensure the underside of the succeeding sheet is clean, dry and free from contamination before attempting to overlap. Peel back the plastic release liner from between the overlaps as the two layers are bonded together. Ensure a continuous bond is achieved without creases and roll firmly with a heavy roller. Completely remove the plastic liner to expose the protective coating. Any initial tack will quickly disappear products. Refer to Grace Tech Letter 15 for information on suitable rebar chairs for Preprufe products.

**Vertical substrates**—Mechanically fasten the membrane vertically using fasteners appropriate to the substrate with the the clear plastic release liner facing towards the concrete pour. The membrane may be installed in any convenient length. Fastening can be

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

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

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

### Details

Detail drawings are available at [graceconstruction.com](http://graceconstruction.com).

### Membrane Repair

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

### Pouring of Concrete

Ensure the plastic release liner is removed from all areas of Preprufe membrane and tape.

It is recommended that concrete be poured within 56 days (42 days in hot climates) of application of the membrane. Following proper ACI guidelines, concrete must be placed carefully and consolidated properly to avoid damage to the membrane. Never use a sharp object to consolidate the concrete.

### Removal of Formwork

Preprufe® membranes can be applied to removable formwork, such as slab perimeters, elevator and lift pits, etc. Once the concrete is poured the formwork must remain in place until the concrete has gained sufficient compressive strength to develop the surface bond. Preprufe membranes are not recommended for conventional twin-sided wall forming systems, see Grace Tech Letter 13 for information on forming systems used with Preprufe products.

Figure 1



Figure 2

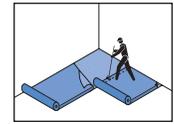
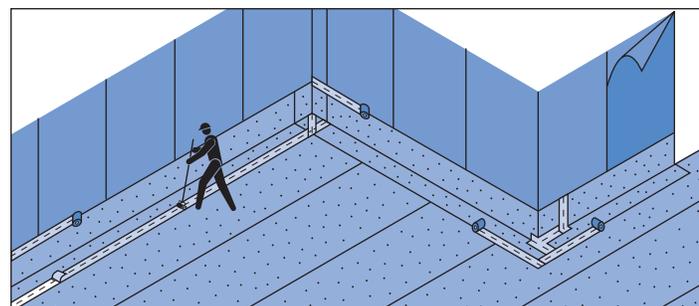
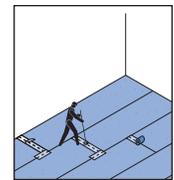


Figure 3

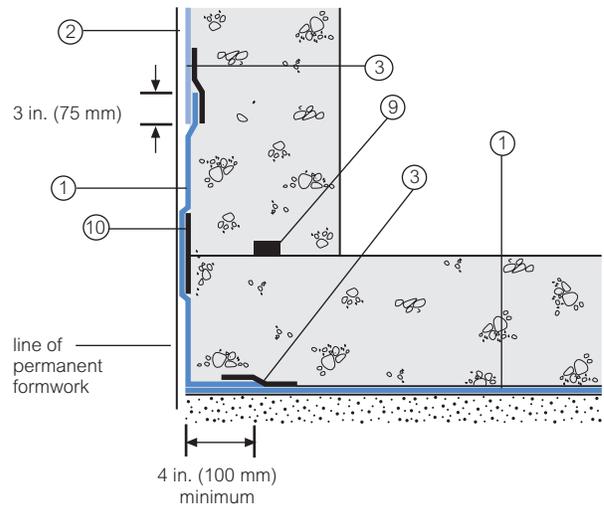


## Detail Drawings

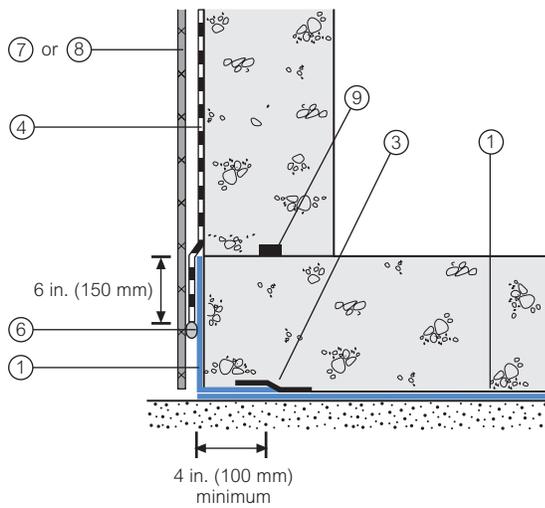
Details shown are typical illustrations and not working details. For a list of the most current details, visit us at [graceconstruction.com](http://graceconstruction.com).

For technical assistance with detailing and problem solving please call toll free at 866-333-3SBM (3726).

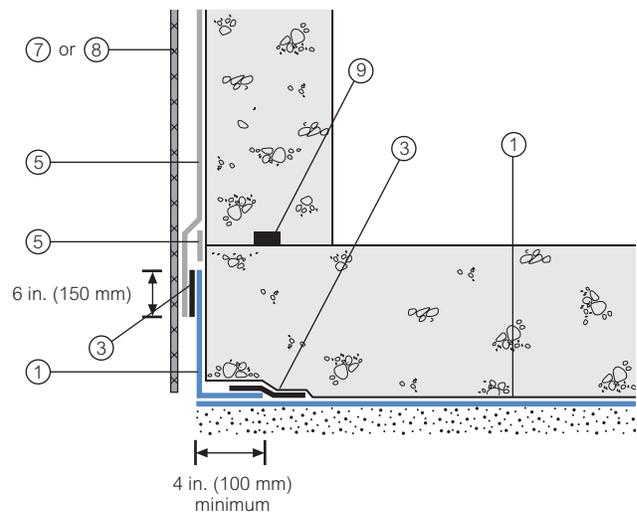
### Wall base detail against permanent shutter



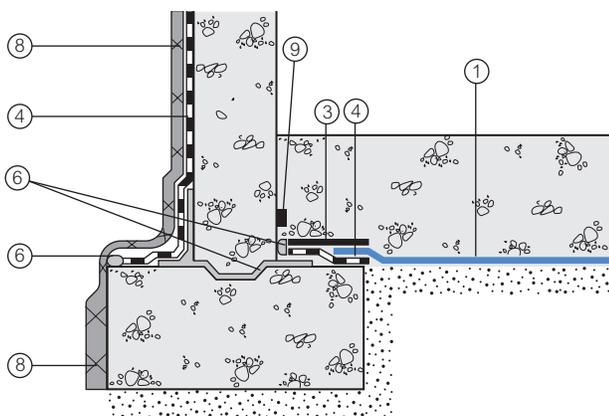
### Bituthene® wall base detail (Option 1)



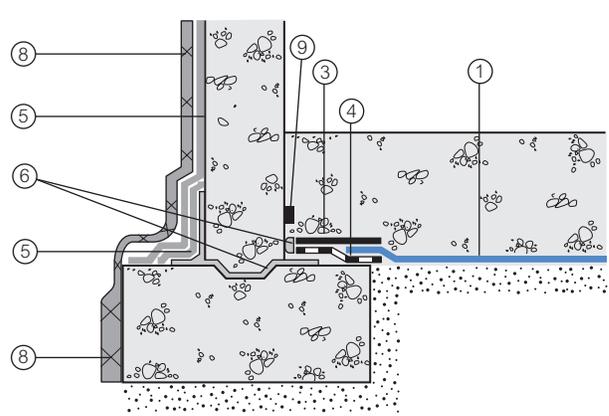
### Procor® wall base detail (Option 1)



### Bituthene® wall base detail (Option 2)



### Procor® wall base detail (Option 2)



- 1 Preprufe® 300R
- 2 Preprufe® 160R
- 3 Preprufe® Tape
- 4 Bituthene®

- 5 Procor®
- 6 Bituthene® Liquid Membrane
- 7 Approved Protection Course

- 8 Hydroduct®
- 9 Adcor™ ES
- 10 Preprufe® CJ Tape

## Supply

Dimensions (Nominal)	Preprufe 300R Membrane	Preprufe 160R Membrane	Preprufe Tape (LT or HC*)
Thickness	0.046 in. (1.2 mm)	0.032 in. (0.8 mm)	
Roll size	4 ft x 98 ft (1.2 m x 30 m)	4 ft x 115 ft (1.2 m x 35 m)	4 in. x 49 ft (100 mm x 15 m)
Roll area	392 ft <sup>2</sup> (36 m <sup>2</sup> )	460 ft <sup>2</sup> (42 m <sup>2</sup> )	
Roll weight	108 lbs (50 kg)	92 lbs (42 kg)	4.3 lbs (2 kg)
Minimum side/end laps	3 in. (75 mm)	3 in. (75 mm)	3 in. (75 mm)

## Physical Properties

Property	Typical Value 300R	Typical Value 160R	Test Method
Color	white	white	
Thickness	0.046 in. (1.2 mm)	0.032 in. (0.8 mm)	ASTM D3767
Lateral Water Migration Resistance	Pass at 231 ft (71 m) of hydrostatic head pressure	Pass at 231 ft (71 m) of hydrostatic head pressure	ASTM D5385, modified <sup>1</sup>
Low temperature flexibility	Unaffected at -20°F (-29°C)	Unaffected at -20°F (-29°C)	ASTM D1970
Resistance to hydrostatic head	231 ft (71 m)	231 ft (71 m)	ASTM D5385, modified <sup>2</sup>
Elongation	500%	500%	ASTM D412, modified <sup>3</sup>
Tensile strength, film	4000 psi (27.6 MPa)	4000 psi (27.6 MPa)	ASTM D412
Crack cycling at -9.4°F (-23°C), 100 cycles	Unaffected, Pass	Unaffected, Pass	ASTM C836
Puncture resistance	221 lbs (990 N)	100 lbs (445 N)	ASTM E154
Peel adhesion to concrete	5 lbs/in. (880 N/m)	5 lbs/in. (880 N/m)	ASTM D903, modified <sup>4</sup>
Lap peel adhesion	5 lbs/in. (880 N/m)	5 lbs/in. (880 N/m)	ASTM D1876, modified <sup>5</sup>
Permeance to water vapor transmission	0.01 perms (0.6 ng/(Pa x s x m <sup>2</sup> ))	0.01 perms (0.6 ng/(Pa x s x m <sup>2</sup> ))	ASTM E96, method B
Water absorption	0.5%	0.5%	ASTM D570

### Footnotes:

- Lateral water migration resistance is tested by casting concrete against membrane with a hole and subjecting the membrane to hydrostatic head pressure with water. The test measures the resistance of lateral water migration between the concrete and the membrane.
- Hydrostatic head tests of Preprufe Membranes are performed by casting concrete against the membrane with a lap. Before the concrete cures, a 0.125 in. (3 mm) spacer is inserted perpendicular to the membrane to create a gap. The cured block is placed in a chamber where water is introduced to the membrane surface up to the head indicated.
- Elongation of membrane is run at a rate of 2 in. (50 mm) per minute.
- Concrete is cast against the protective coating surface of the membrane and allowed to properly dry (7 days minimum). Peel adhesion of membrane to concrete is measured at a rate of 2 in. (50 mm) per minute at room temperature.
- The test is conducted 15 minutes after the lap is formed (per Grace published recommendations) and run at a rate of 2 in. (50 mm) per minute.

### Removal of Formwork (continued)

A minimum concrete compressive strength of 3000 psi (20 N/mm<sup>2</sup>) is recommended prior to stripping formwork supporting Preprufe® membranes. Premature stripping may result in displacement of the membrane and/or spalling of the concrete.

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

### Specification Clauses

Preprufe 300R® or 160R membrane shall be applied with its protective coating presented to receive fresh concrete to which it will integrally bond. Only Grace Construction Products approved

membranes shall be bonded to Preprufe 300R/160R product. All Preprufe 300R/160R system materials shall be supplied by Grace Construction Products, and applied strictly in accordance with their instructions. Specimen performance and formatted clauses are also available.

NOTE: Use Preprufe Tape to tie-in Procor® fluid-applied membrane with Preprufe® products.

### Health and Safety

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

[www.graceconstruction.com](http://www.graceconstruction.com)

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

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PF-1111 Printed in U.S.A. 12/14 GCS/PDF

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