

**DUMBO – 177 FRONT STREET
BROOKLYN, NEW YORK**

Remedial Action Work Plan

NYC VCP Number: 14CVCP180K

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REMEDIAL ACTION WORK PLAN

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LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
AS/SVE	Air Sparging/Soil Vapor Extraction
BOA	Brownfield Opportunity Area
CAMP	Community Air Monitoring Plan
C/D	Construction/Demolition
COC	Certificate of Completion
CQAP	Construction Quality Assurance Plan
CSOP	Contractors Site Operation Plan
DCR	Declaration of Covenants and Restrictions
ECs/ICs	Engineering and Institutional Controls
HASP	Health and Safety Plan
IRM	Interim Remedial Measure
BCA	Brownfield Cleanup Agreement
MNA	Monitored Natural Attenuation
NOC	Notice of Completion
NYC VCP	New York City Voluntary Cleanup Program
NYC DEP	New York City Department of Environmental Protection
NYC DOHMH	New York State Department of Health and Mental Hygiene
NYCRR	New York Codes Rules and Regulations
NYC OER	New York City Office of Environmental Remediation
NYS DEC	New York State Department of Environmental Conservation
NYS DEC DER	New York State Department of Environmental Conservation Division of Environmental Remediation
NYS DOH	New York State Department of Health
NYS DOT	New York State Department of Transportation
ORC	Oxygen-Release Compound
OSHA	United States Occupational Health and Safety Administration
PE	Professional Engineer

PID	Photo Ionization Detector
QEP	Qualified Environmental Professional
QHHEA	Qualitative Human Health Exposure Assessment
RAOs	Remedial Action Objectives
RAR	Remedial Action Report
RAWP	Remedial Action Work Plan or Plan
RCA	Recycled Concrete Aggregate
RD	Remedial Design
RI	Remedial Investigation
RMZ	Residual Management Zone
SCOs	Soil Cleanup Objectives
SCG	Standards, Criteria and Guidance
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SVOC	Semi-Volatile Organic Compound
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

Dumbo Assemblage LLC has applied to enroll in the New York City Voluntary Brownfield Cleanup Program (NYC VCP) to investigate and remediate a 19,950-square foot site located at 173, 177 and 185 Front Street in Brooklyn, 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 Current Usage

The Site is located at 173, 177 and 185 Front Street in the Dumbo section in Brooklyn, New York and is identified as Block 41, Lots 44, 42 and the southern portion of Lot 13 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 18,625-square feet and is bounded by the 200 Water Street Development Property to the north, Front Street to the south, a five-story residence to the east, and one- to two-story commercial buildings to the west. A map of the Site boundary is shown in Figure 2. Currently, the Site is vacant and is comprised of three contiguous lots. The Lot 13 portion of the Site (185 Front Street) consists of an asphalt-paved parking lot. A one-story building occupies the entire parcel on Lot 42 (177 Front Street). A gravel-lined parking lot occupies the entire parcel on Lot 44 (173 Front Street).

Summary of Proposed Redevelopment Plan

The proposed future use of the Site will consist of a new 12-story apartment building, with a cellar level parking garage. The new building will occupy the entire lot with a gross floor area of 105,023 ft² and a maximum height of 120 feet above grade. The first floor will include a 1,447 ft² commercial space, lobby, recreational area and seven residential apartments. An additional 94 residential apartment units will be present on the 2nd through 12th floors. The cellar will include a parking garage, utility rooms, bicycle storage, and commercial storage. The maximum excavation depth for the cellar is approximately 12 feet below ground surface (bgs), which based

on current site grade will generate approximately 8,277 yds³ of excavated soil for disposal off-site. Site excavation is not anticipated to extend beneath the existing water table at approximately 25 to 35 feet bgs. A 30-foot patio and landscape area will be present along the northern portion of the site. Construction of the new building will require the demolition of the existing single-story, 5,200 ft² building at 177 Front Street. Layout of the proposed site development is presented in Figure 3 and Appendix 4.

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

Summary of the Remedy

The proposed remedial action achieves protection of public health and the environment for the intended use of the property. The proposed remedial action achieves all of the remedial action objectives established for the project and addresses applicable standards, criterion, and guidance; is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants; is cost effective and implementable; and uses 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 (CPP);
2. Performance of a Community Air Monitoring Program (CAMP) for particulates and volatile organic carbon compounds;
3. Establish Track 4 Site Specific Soil Cleanup Objectives (SCOs);
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas;
5. Excavation and removal of soil/fill exceeding SCOs. For new development, the entire foot print of the site will be excavated to a depth of 12 feet for cellar level parking;

6. 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;
7. Removal of underground storage tanks (if encountered) and closure of petroleum spills in compliance with applicable local, State and Federal laws and regulations.
8. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities;
9. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs;
10. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations;
11. Installation of a vapor barrier system beneath the building slab and outside foundation sidewalls below grade. The vapor barrier will extend over the entire footprint of the building to be constructed on-Site and consist of the Stego Wrap Vapor Barrier manufactured by Stego Industries LLC or approved equal product;
12. Construction of an ventilated parking garage per NYC Building's codes and regulations;
13. Construction and maintenance of an engineered composite cover consisting of the building basement slab and foundation to prevent human exposure to residual soil/fill remaining under the Site;
14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations;
15. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations;

16. 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 describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP;
17. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for maintenance, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency; and
18. Continued registration with an E-Designation; establishment of Engineering Controls and Institutional Controls in this RAWP and a requirement that management of these controls must be in compliance with an approved SMP; and Institutional Controls will include prohibition of the following: (1) vegetable gardening and farming; (2) use of groundwater without treatment rendering it safe for the intended use; (3) disturbance of residual contaminated material unless it is conducted in accordance with the SMP; and (4) higher-level of land usage without OER approval.

COMMUNITY PROTECTION STATEMENT

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

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

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

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

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

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

Site Safety Coordinator. This project has a designated Site safety coordinator to implement the Health and Safety Plan. The safety coordinator maintains an emergency contact sheet and protocol for management of emergencies. The Site safety coordinator is designated as Joseph Armocida, TRM Contracting LLC, and can be reached at 914-265-7354.

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 (CAMP). Results will be regularly reported to the NYC OER. This cleanup plan also has a plan to address any unforeseen problems that might occur during the cleanup (called a 'Contingency Plan').

Odor, Dust and Noise Control. This cleanup plan includes actions for odor and dust control. These actions are designed to prevent off-Site odor and dust nuisances and includes steps to be taken if nuisances are detected. Generally, dust is managed by application of physical covers and by water sprays. Odors are controlled by limiting the area of open excavations, physical covers, spray foams and by a series of other actions (called operational measures). The project is also required to comply with NYC noise control standards. If you observe problems in these areas, please contact the onsite Project Manager Joseph Armocida, with TRM Contracting LLC, at 914-265-7354; or NYC Office of Environmental Remediation Project Manager Rebecca Bub at 212-341-2073.

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

Storm-Water Management. To limit the potential for soil erosion and discharge, this cleanup plan has provisions for storm-water management. The main elements of the storm water management include physical barriers such as tarp covers and erosion fencing, and a program for frequent inspection.

Hours of Operation. The hours for operation of cleanup will comply with the NYC Department of Buildings construction code requirements or according to specific variances issued by that agency. For this cleanup project, the hours of operation are 7:00 a.m. to 4:00 p.m. Monday through Friday.

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

Complaint Management. The contractor performing this cleanup is required to address all complaints. If you have any complaints, you can call the facility Project Manager which will be Joseph Armocida, with TRM Contracting LLC, at 914-265-7354; or NYC Office of Environmental Remediation Project Manager Rebecca Bub at 212-341-2073, 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, odors and erosion. Stockpiles will be frequently inspected. Damaged tarp covers will be promptly replaced. Stockpiles will be protected with silt fences. Hay bales will be used, as needed to protect storm water catch basins and other discharge points.

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

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

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

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

Truck Routing. Truck routes have been selected to: (a) limit transport through residential areas and past sensitive nearby properties; (b) maximize use of city-mapped truck routes; (c) limit total distance to major highways; (d) promote safety in entry to highways; (e) promote overall safety in trucking; and (f) minimize off-Site line-ups (queuing) of trucks entering the

property. Operators of loaded trucks leaving the Site will be instructed not to stop or idle in the local neighborhood.

Final Report. The results of all cleanup work will be fully documented in a final report (called a Remedial Action Report) that will be available for you to review in the public document repositories located at Brooklyn Heights Library.

Long-Term Site Management. To provide long-term protection 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 in the property's deed or established through a city environmental designation. A certification of continued protectiveness of the cleanup will be required from time to time to show that the approved cleanup is still effective.

REMEDIAL ACTION WORK PLAN

1.0 SITE BACKGROUND

Dumbo Assemblage LLC has applied to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate a property located at 173, 177 and 185 Front Street in the Dumbo section of Brooklyn, New York (the “Site”). A Remedial Investigation (RI) was performed to compile and evaluate data and information necessary to develop this Remedial Action Work Plan (RAWP) in a manner that will render the Site protective of public health and the environment consistent with the contemplated end use. This RAWP establishes remedial action objectives, provides a remedial alternatives analysis that includes consideration of a permanent cleanup, and provides a description of the selected remedial action. The remedial action described in this document provides for the protection of public health and the environment, complies with applicable environmental standards, criteria and guidance and applicable laws and regulations.

1.1 SITE LOCATION AND CURRENT USAGE

The Site is located at 173, 177 and 185 Front Street in the Dumbo section in Brooklyn, New York and is identified as Block 41, Lots 44, 42 and the southern portion of Lot 13 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 18,625-square feet and is bounded by the 200 Water Street Development Property to the north, Front Street to the south, a five-story residence to the east, and one- to two-story commercial buildings to the west. A map of the Site boundary is shown in Figure 2. Currently, the Site is vacant and is comprised of three contiguous lots. The Lot 13 portion of the Site (185 Front Street) consists of an asphalt-paved parking lot. A one-story building occupies the entire parcel on Lot 42 (177 Front Street). A gravel-lined parking lot occupies the entire parcel on Lot 44 (173 Front Street).

1.2 PROPOSED REDEVELOPMENT PLAN

The proposed future use of the Site will consist of a new 12-story apartment building, with a cellar level parking garage. The new building will occupy the entire lot with a gross floor area of 105,023 ft² and a maximum height of 120 feet above grade. The first floor will include a 1,447 ft² commercial space, lobby, recreational area and seven residential apartments. An additional 94 residential apartment units will be present on the 2nd through 12th floors. The cellar will include a parking garage, utility rooms, bicycle storage, and commercial storage. The maximum excavation depth for the cellar is approximately 12 feet below ground surface (bgs), which based on current site grade will generate approximately 8,277 yds³ of excavated soil for disposal off-site. Site excavation is not anticipated to extend beneath the existing water table at approximately 25 to 35 feet bgs. A 30-foot patio and landscape area will be present along the northern portion of the site. Construction of the new building will require the demolition of the existing single-story, 5,200 ft² building at 177 Front Street. Layout of the proposed site development is presented in Figure 3 and Appendix 4.

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

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The surrounding properties are predominately residential and commercial with some manufacturing. Adjacent properties include:

Direction From Site	Address	Occupant(s) Name or Type	Current Use
North	192 Water Street	Newly constructed five-story building	Commercial
North	200 Water Street	Four-story former warehouse building	Vacant
East	220 Water Street	Seven-story residential building	Residential
South	87 Jay Street	Parking Facilities	Parking
West	73 Jay Street	One-story commercial building	Commercial

Direction From Site	Address	Occupant(s) Name or Type	Current Use
West	67 Jay Street	Commercial building	Commercial

No schools, hospitals or daycare facilities were identified within a 500-foot radius of the site. Figure 4 shows the surrounding land usage.

1.4 REMEDIAL INVESTIGATION

A remedial investigation was performed and the results are documented in a companion document called “*Remedial Investigation Report, Dumbo-177Front Street, Brooklyn, New York*”, dated February 2012 (RIR).

The review of historical Sanborn maps depicted the Site with nine dwellings along Front Street in 1887; dwellings, a store, a wagon house, and mason's storage in 1904; and dwellings along Front Street in 1915. In 1938, the northern and eastern portions of the Site (185 Front Street) is depicted as vacant land and labeled Kirkman and Son Inc. storage of coal and glycerine drums, the central portion of the Site along Front Street (177 Front Street) is depicted with the existing one-story building identified as a garage with two gasoline tanks, and the eastern portion of the Site along Front Street (173 Front Street) was depicted as vacant land. The north adjoining property was depicted with the existing three-story building (200 Water Street), identified as Brillo manufacturing, and constructed in 1950; with vacant land on the remainder of that lot at 185 Front Street. In 1969, the one-story building at 177 Front Street was depicted as beverage storage and 173 Front Street was a vacant lot identified as parking. The 1977 Sanborn map identified the three-story north adjoining building as manufacturing and labeled Len Art Co. The reference to Len Art Co. was not present in 1979 and all subsequent years through 2007 identified the property use as the three-story manufacturing building with parking (185 Front Street), a one-story building identified as beverage storage (177 Front Street), and a vacant lot used for parking (173 Front Street). The review of the Sanborn maps identified the surrounding property use as manufacturing including foundry, lead works, shoe factory, warehouses, brewing company, electric company, smelting, tin plate decorating, residential, stores, commercial.

The AOCs identified for this Site include:

1. Historical manufacturing at adjoining 200 Water Street;

2. Historical coal and glycerine drum storage at 185 Front Street;
3. Potential presence of historical gasoline tanks in the southeastern portion of the one-story building located at 177 Front Street;
4. Historic fill in shallow soils; and
5. Reported groundwater volatile organic compound (VOC) contamination at the east adjoining property (220 Water Street).

Summary of the Work Performed under the Remedial Investigation

Dumbo Assemblage LLC performed the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed seven soil borings across the entire project Site, and collected 14 soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed three temporary groundwater monitoring wells throughout the Site and collected three groundwater samples for chemical analysis to evaluate groundwater quality;
4. Installed four soil vapor probes around Site perimeter and collected four samples for chemical analysis.
5. Collected one ambient air sample for chemical analysis.

Summary of Environmental Findings

1. Elevation of the Site ranges from 25 to 36 feet.
2. Depth to groundwater ranges from 26 to 35 feet at the Site.
3. Groundwater flow is generally from southeast to northwest beneath the Site.
4. Depth to bedrock is greater than 40 feet at the Site.

5. The stratigraphy of the Site, from the surface down, consists of fill material to a depth of 8 to 13 feet bgs underlain by varying gradations of brown and light brown and reddish brown sands and silts, with a little gravel, to a termination depth of 20 feet bgs.
6. Soil/fill samples collected during the RI detected no pesticides or PCBs. TCE (max. of 0.061 mg/Kg) was detected in two of 14 samples, at low levels and in only shallow soil samples, and well below Unrestricted Use SCOs. Three other VOCs were detected at low levels in two of 14 samples. Seven SVOCs including benzo(a)anthracene (max. of 11 mg/Kg), benzo(a)pyrene (max. of 11 mg/Kg), benzo(b)fluoranthene (max. of 13 mg/Kg), benzo(k)fluoranthene (max. of 4.2 mg/Kg), chrysene (max. of 11 mg/Kg), dibenzo(a,h)anthracene (max. of 1.3 mg/Kg), and indeno(1,2,3-cd)pyrene (max. of 5.8 mg/Kg) were detected in four of the seven shallow soil samples above their respective Unrestricted Use as well as Restricted Residential Use SCOs. The SVOCs detected were all polyaromatic hydrocarbon compounds (PAHs) typically associated with historic fill material. Metals including; arsenic (in two shallow soils at max. of 38.7 mg/Kg), beryllium (one sample at 12.2 mg/Kg), cadmium (in one sample at 2.81 mg/Kg), chromium (in one sample at 141 mg/Kg), copper (max. of 1,530 mg/Kg), lead (max. of 1,180 mg/Kg), magnesium (in all samples at max. of 13,600 mg/Kg), mercury (max. of 0.46 mg/Kg), nickel (max. of 269 mg/Kg) and zinc (max. of 321 mg/Kg) were detected above Unrestricted Use SCOs. Of these, arsenic, copper, lead, and magnesium also exceeded Restricted Residential SCOs. Overall the soil testing results were consistent with the observation of historic fill at the shallow depths throughout the Site. The RI did not reveal any contaminant source areas on the Site.
7. Groundwater samples collected during the RI detected no SVOC, PCBs or pesticides in any of three groundwater samples. Trichloroethene (TCE) was detected at concentrations ranging from 2.1 ug/L to 8.3 ug/L in all three wells, but only exceeded NYSDEC 6 NYCRR Part 703.5 Groundwater Quality Standards (GQS) in one well. No other VOCs were detected in groundwater samples. Metals including iron, manganese, and sodium were detected above their respective GQS. The RI indicates that the groundwater is slightly impacted with chlorinated hydrocarbons.

8. Soil vapor samples collected during the RI showed moderate levels of petroleum related and chlorinated VOCs in all soil vapor samples. Overall the highest reported concentrations were for acetone (all samples at max of 1199 $\mu\text{g}/\text{m}^3$), toluene (max of 211 $\mu\text{g}/\text{m}^3$), and xylene (max. of 221 $\mu\text{g}/\text{m}^3$). Chlorinated VOCs including 1,1,1-Trichloroethane was detected in all four samples and concentrations ranged from 0.76 $\mu\text{g}/\text{m}^3$ to 37.5 $\mu\text{g}/\text{m}^3$. Carbon tetrachloride was detected in all four samples at concentrations ranging from 0.69 $\mu\text{g}/\text{m}^3$ to 4.28 $\mu\text{g}/\text{m}^3$. PCE concentrations ranged from 134 $\mu\text{g}/\text{m}^3$ to 204 $\mu\text{g}/\text{m}^3$, and TCE concentrations ranged from 20.4 $\mu\text{g}/\text{m}^3$ to 348 $\mu\text{g}/\text{m}^3$. PCE and TCE were detected in all four soil vapor samples above the monitoring level ranges established within the New York State Department of Health (NYSDOH) Final Guidance on Soil Vapor Intrusion (October 2006) values (AGVs).

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:

Groundwater

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

Soil

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

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 under 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). A remedy is then developed 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.

The following is a detailed description of the alternatives analysis and remedy selection to address impacted media at the Site. As required, a minimum of two remedial alternatives (including a Track 1 scenario) are evaluated, as follows:

Alternative 1 involves:

- Establishment of Unrestricted Use (Track 1) Soil Cleanup Objectives SCOs.
- Removal of all soil/fill exceeding Unrestricted Use SCOs throughout the Site and confirmation that Track 1 Unrestricted Use SCOs have been achieved with post-excavation endpoint sampling. This alternative would require excavation across the entire site to a minimum depth of 13 feet below ground surface. 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 (to a depth of 12 feet) is complete, additional excavation will be performed to ensure complete removal of soil that does not meet Track 1 Unrestricted Use SCOs. Footings and foundations for the proposed building would be constructed after the removal of contaminated soil and the importation of clean backfill to achieve required grade prior to construction.

- No Engineering or Institutional Controls are required for a Track 1 cleanup, but a vapor barrier would be installed beneath the foundation and behind foundation sidewalls of the new building as a part of development to prevent any potential future exposures from off-Site soil vapor.
- As part of new construction, a passive Sub Slab Depressurization system will be installed in the gravel layer beneath the building slab to address potential soil vapor intrusion.
- Placement of a final cover over the entire Site as part of new development.

Alternative 2 involves:

- Establishment of Track 4 Site-Specific SCOs
- Removal of all soil/fill exceeding Track 4 Site-Specific SCOs and confirmation that Track 4 Site-Specific SCOs have been achieved with post-excavation endpoint sampling. Excavation for the planned basement level would take place to a depth of approximately 13 feet bgs.
- Placement of a final cover over the entire Site to prevent exposure to remaining soil/fill;
- Placement of a soil vapor barrier system beneath the building slab and along foundation side walls to prevent any potential future exposures from off-Site soil vapor;
- Construction of a ventilated parking garage per NYC Building's codes and regulations;
- Establishment of use restrictions including prohibitions on the use of groundwater from the Site; prohibitions of sensitive 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; and

- 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; and continued registration as an E-designated property to memorialize the remedial action and the Engineering and Institutional Controls required by the RAWP.

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 contaminated soil/fill exceeding Track 1 Unrestricted Use SCOs and groundwater protection standards, thus eliminating potential for direct contact with contaminated soil/fill once construction is complete and eliminating the risk of contamination leaching into groundwater.

Alternative 2 would achieve comparable protections of human health and the environment by excavating the historic fill at the Site and by ensuring that remaining soil/fill on-Site meets Track 4 Site-Specific SCOs, as well as by placement of Institutional and Engineering controls, including a composite cover system, vapor barrier and a passive SSDS. The composite cover system would prevent direct contact with any remaining on-Site soil/fill. Implementing Institutional Controls including a Site Management Plan and continued "E" designation of property would ensure that the composite cover system remains intact and protective. Establishment of Track 4 Site-Specific SCOs would minimize the risk of contamination leaching into groundwater.

For both Alternatives, potential exposure to the contaminated soils or groundwater during construction would be minimized by implementing a Construction Health and Safety Plan (CHASP), a Soil and Materials Management Plan, and Community Air Monitoring Plan

(CAMP). Groundwater is not expected to be encountered during development, and 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 system below the new building's basement slab and continuing the vapor barrier around the foundation walls, and installing a passive SSDS system in the gravel layer beneath the building slab. Additionally, a ventilated parking garage in new basement would prevent any vapors from accumulating in the new building.

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 ROAs through removal of soil to achieve Track 1 Unrestricted Use SCOs and Groundwater Protection Standards. Compliance with SCGs for soil vapor would also be achieved by installing a SSDS and vapor barrier system below the new building's slab and continuing the vapor barrier around the foundations walls, as part of development.

Alternative 2 would achieve compliance with the remedial goals, chemical-specific SCGs and RAOs for soil through removal of soil to meet Track 4 Site-Specific SCOs. Compliance with SCGs for soil vapor would also be achieved by installing a passive SSDS and a vapor barrier below the new building's slab and continuing the vapor barrier outside foundation walls. A Site Management Plan would ensure that these controls remained protective for the long term.

Health and safety measures contained in the CHASP and Community Air Monitoring Plan (CAMP) that comply with the applicable SCGs shall 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 effects on public health and the environment during implementation of the remedial action, including protection of the community, environmental impacts, time until remedial response objectives are achieved, and protection of workers during remedial actions.

Both alternatives 1 and 2 have similar short term effectiveness during their respective implementations, as each requires excavation of all or most 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 the Alternative 1 if excavation of greater amounts of historical fill material is encountered below the excavation depth of the proposed building. However, focused attention to means and methods during the remedial action during a Track 1 removal action, including community air monitoring and appropriate truck routing, would minimize or negate the overall impact of these activities.

An additional short-term adverse impact and risks to the community associated with both remedial alternatives is increased truck traffic. Approximately 500, 25-ton capacity truck trips would be necessary to transport fill and soil excavated during Site development. Truck traffic will be routed on the most direct course using major thoroughfares where possible and flaggers will be used to protect pedestrians at Site entrances and exits.

Both alternatives would employ appropriate measures to prevent short term impacts, including 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 be protected from on-Site contaminants (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 ECs/ICs that may be used to manage contaminant residuals that remain at the Site and assessment of containment systems and ICs that are designed to eliminate exposures to contaminants, and long-term reliability of Engineering Controls.

Alternative 1 would achieve long-term effectiveness and permanence related to on-Site contamination by permanently removing all impacted soil/fill and enabling unrestricted usage of the property.

Alternative 2 would provide long-term effectiveness by removing most on-Site contamination and attaining Track 4 Site-Specific SCOs, by establishing Engineering Controls including a vapor barrier and composite cover system across the Site; by establishing Institutional Controls to ensure long-term management including use restrictions, a Site Management Plan and continued registration as 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 will provide continued high level of protection in perpetuity.

Both alternatives would result in removal of soil contamination exceeding the SCOs providing the highest level, most effective and permanent remedy over the long-term with respect to a remedy for contaminated soil, which will eliminate any migration to groundwater. Potential sources of soil vapor and groundwater contamination would also be eliminated as part of the remedy.

Reduction of toxicity, mobility, or volume of contaminated material

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

Alternative 1 would provide maximum reduction of toxicity, mobility and volume of contaminated material on-Site by excavation and removal of all soils that exceed the Track 1 unrestricted use SCOs.

Alternative 2 would remove all or most of the historic fill at the Site, and any remaining on-Site soil beneath the new building will meet Track 4 - Site-Specific SCOs. Alternative 1 would eliminate a greater total mass of contaminants on Site.

The removal of soil to 13 feet for the new development in both scenarios would probably result in relatively minor differences 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.

Both alternatives are both feasible and implementable. They use identical standard materials and services and well established technology. The reliability of each remedy is high. There are

no special difficulties associated with any of the activities proposed but will require a long period of time to accomplish due to the large quantity of soil and fill material that would require removal. However, Alternative 1 may require additional shoring to excavate deeper than the new buildings planned excavation depth of 12 feet bgs.

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 during the RI to only extend to a depth of up to 13 feet below grade, and the new building requires excavation of the entire Site to a depth of 12ft, the costs associated with both Alternative 1 and Alternative 2 will likely be the comparable. Costs associated with Alternative 1 could potentially be higher than Alternative 2 if soil with analytes above Unrestricted Use SCOs is encountered below the excavation depth required for development.

Costs associated with Alternative 1 are estimated at approximately \$1,170,000. The following items and assumptions were included in this cost estimate:

- Excavation to a depth of 15 feet bgs within a 18,625 ft² area;
- Transportation and disposal of 15,520 tons of excavated soil as non-hazardous;
- Backfilling with certified clean fill;
- Installation of vapor barrier beneath building slab;
- HASP and CAMP monitoring for the duration of the remedial activities;
- Post-excavation soil sampling; and
- Remedial Action Report.

Costs associated with Alternative 2 are estimated at approximately \$960,000. The following items and assumptions were included in this cost estimate:

- Excavation to a depth of 12 feet bgs within a 18,625 ft² area;
- Transportation and disposal of 12,416 tons of excavated soil as non-hazardous;
- Backfilling with certified clean fill;
- Installation of vapor barrier beneath building slab;
- HASP and CAMP monitoring for the duration of the remedial activities;
- Post-excavation soil sampling; and
- Remedial Action Report.

Both cost estimates do not include any shoring or stabilization of nearby structures. The remedial plan creates an approach that combines the remedial action with the redevelopment of the Site, including the construction of the building foundation and subgrade structures. The remedial plan is also cost effective in that it will take into consideration the selection of the closest and most appropriate disposal facilities to reduce transportation and disposal costs during the excavation of historic fill and other soils during the redevelopment of the Site.

Community Acceptance

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

Based on the overall goals of the remedial program and initial observations by the project team, both alternatives will be acceptable to the community. This RAWP will be subject to and undergo public review under the NYC VCP and will provide the opportunity for detailed public input on the remedial alternative and the selected remedial action. 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 1.

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 proposed redevelopment of the Site is compatible with its current zoning and is consistent with recent development patterns. Following remediation, the Site will meet either Track 1 Unrestricted Use or Track 4 Site-Specific SCOs, both of which are appropriate for its planned residential use. Both alternatives for remedial action at the site are comparable with respect to the proposed use and to land uses in the vicinity of the Site. The proposed use is consistent with the existing zoning designation for the property and is consistent with recent development patterns. The Site is surrounded by residential and commercial properties and the proposed alternative provides comprehensive protection of public health and the environment for these uses. Improvements in the current environmental condition of the property achieved by the alternatives are also consistent with the City's goals for cleanup of contaminated land and bringing such properties into productive reuse. The alternatives are equally protective of natural resources and cultural resources. This RAWP will be subject to public review under the NYC VCP and will provide the opportunity for detailed public input on the land use factors described in this section. This public comment will be considered by OER prior to approval of this plan.

Sustainability of the Remedial Action

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

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

While Alternative 2 would potentially result in lower energy usage based on reducing the volume of material transported off-Site, both remedial alternatives are comparable with respect to the opportunity to achieve sustainable remedial action. The remedial plan would take into consideration the shortest trucking routes during off-Site disposal of historic fill and other soils, which would reduce greenhouse gas emissions and conserve energy used to fuel trucks. To the extent practicable, energy efficient building materials, appliances, and equipment will be utilized to complete the development. A complete list of green remedial activities considered as part of the NYC VCP is included in the Sustainability Statement, included as Appendix C.

4.0 REMEDIAL ACTION

4.1 SUMMARY OF PREFERRED REMEDIAL ACTION

The preferred remedial action alternative is Alternative 2, the Track 4 Alternative. The preferred remedial action alternative achieves protection of public health and the environment for the intended use of the property. The preferred remedial action alternative will achieve all of the remedial action objectives established for the project and addresses applicable SCGs. The preferred remedial action alternative is effective in both the short-term and long-term and reduces mobility, toxicity and volume of contaminants. The preferred remedial action alternative is cost effective and implementable and uses 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 (CPP);
2. Performance of a Community Air Monitoring Program (CAMP) for particulates and volatile organic carbon compounds;
3. Establish Track 4 Site Specific Soil Cleanup Objectives (SCOs);
4. Site mobilization involving Site security setup, equipment mobilization, utility mark outs and marking & staking excavation areas;
5. Excavation and removal of soil/fill exceeding SCOs. For new development, the entire foot print of the site will be excavated to a depth of 12 feet for cellar level parking;
6. 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;
7. Removal of underground storage tanks (if encountered) and closure of petroleum spills in compliance with applicable local, State and Federal laws and regulations.

8. Transportation and off-Site disposal of all soil/fill material at permitted facilities in accordance with applicable laws and regulations for handling, transport, and disposal, and this plan. Sampling and analysis of excavated media as required by disposal facilities;
9. Collection and analysis of end-point samples to determine the performance of the remedy with respect to attainment of SCOs;
10. Import of materials to be used for backfill and cover in compliance with this plan and in accordance with applicable laws and regulations;
11. Installation of a vapor barrier system beneath the building slab and outside foundation sidewalls below grade. The vapor barrier will extend over the entire footprint of the building to be constructed on-Site and consist of the Stego Wrap Vapor Barrier manufactured by Stego Industries LLC or approved equal product;
12. Construction of an ventilated parking garage per NYC Building's codes and regulations;
13. Construction and maintenance of an engineered composite cover consisting of the building basement slab and foundation to prevent human exposure to residual soil/fill remaining under the Site;
14. Implementation of storm-water pollution prevention measures in compliance with applicable laws and regulations;
15. Performance of all activities required for the remedial action, including permitting requirements and pretreatment requirements, in compliance with applicable laws and regulations;
16. 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 describes all Engineering and Institutional Controls to be implemented at the Site, and lists any changes from this RAWP;
17. Submission of an approved Site Management Plan (SMP) in the RAR for long-term management of residual contamination, including plans for maintenance, inspection and certification of Engineering and Institutional Controls and reporting at a specified frequency; and

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

4.2 SOIL CLEANUP OBJECTIVES AND SOIL/FILL MANAGEMENT

Track 4 Soil Cleanup Objectives (SCOs) are proposed for this project. The SCOs for this Site are the Restricted Residential SCOs (Track 2) except for the modifications listed in Table 1. 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 3. The location of planned excavations is shown in Figure 5.

TABLE 1 – TRACK 4 SOIL CLEANUP OBJECTIVES	
Total SVOCs	150 mg/kg
Arsenic	23 mg/Kg
Copper	500 mg/Kg
Lead	1,000 mg/kg
Mercury	1.5 mg/kg

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.

Estimated Soil/Fill Removal Quantities

The total quantity of soil/fill expected to be excavated and disposed off-Site is 12,416 tons.

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

End-Point Sampling

Contaminant concentrations have been delineated during the RI and the limits of the excavation have been established. If additional hotspots are identified or if gross contaminated soils are observed and must be removed, removal actions under this plan will be performed in conjunction with confirmation soil sampling. Confirmation samples will be collected from the base of the excavation at locations to be determined by OER. For comparison to Track 4 SCOs, analytes will only include trigger compounds and elements established on the Track 4 SCO list. This sampling and testing will be performed promptly following excavation and be completed prior to any site development activities.

The approximate collection location of the confirmation soil samples is shown on Figure 6. The soil sampling and testing will be performed promptly following excavation and will be completed prior to any site development activities.

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

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

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

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

Soil analytical methods will include:

- Semi-volatile organic compounds by EPA Method 8270;
- Target Analyte List metals; and

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

Samples will be collected into the appropriate containers provided by the laboratory, placed in a cooler, and shipped via overnight courier to the laboratory under proper chain-of-custody procedures. Samples will be preserved through the use of ice or “cold-paks” to maintain a temperature of 4°C.

Disposable sampling equipment will be used for the collection of end-point samples; therefore, no field (rinsate) blanks will be generated. However, if non-disposal sampling equipment is used, field rinsate blanks will be prepared at a rate of one for every 10 samples collected. Sampling equipment will be properly decontaminated prior to reuse. Trip blanks will be used if VOC samples are collected for analysis. Trip blanks will not be required for samples analyzed for SVOCs, metals, PCBs or pesticides. One blind duplicate sample will be collected and submitted for analysis every 20 samples.

Import and Reuse of Soils

Import of soils onto the property and reuse of soils already onsite will be performed in conformance with the Soil/Materials Management Plan in Appendix 3. No significant quantity of soil is anticipated to be imported into the Site for backfill and cover soil. The estimated quantity of onsite soil/fill expected to be reused/relocated to the adjoining Site at 200 Water Street is 1,750 tons.

4.3 ENGINEERING CONTROLS

The excavation required for the proposed Site development will achieve Track 4 Restricted Residential SCOs. Engineering Controls are required to address residual contamination at the Site. The following elements will be incorporated into the foundation design:

- Composite Cover System;
- Vapor Barrier System;
- Ventilated parking garage; and
- Sub-Slab Depressurization System.

Composite Cover System

Exposure to residual soil/fill will be prevented by an engineered, composite cover system to be built on the Site. This composite cover system is comprised of a minimum 36-inch thick concrete foundation and slab beneath the area of the proposed building. The patio area over the parking garage, along the north side of the proposed building, will consist of 2-inch thick pavers resting on top of the parking garage, which will sit on pedestals for leveling. The balance of the area will consist of a 4-inch planting tray that will rest on the roof of the parking garage that will hold topsoil and plants. Figure 7 shows the typical design for the remedial cover system used on this Site.

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

Vapor Barrier System

The migration of soil vapors into the building will be prevented with the combined installation of the concrete cellar foundation slab and vapor barrier. The cellar will be used for vehicle parking, utility rooms and commercial storage. A vapor barrier will be installed over the sub-base material prior to pouring the building foundation slab. The vapor barrier will extend over the entire footprint of the building to be constructed on-Site and consist of the Stego Wrap Vapor Barrier manufactured by Stego Industries LLC or approved equal. Installation specifications will be provided to the construction management company and the installer of the geomembrane. All vapor barrier seams, penetrations, and repairs will be sealed either by the tape method or weld method, in accordance with the manufacturer's recommendations and instructions.

Figure 7 illustrates the extent of the proposed vapor barrier membrane. Installation details with respect to the proposed building foundation, footings, exterior foundation wall, etc. are provided in Figure 8. Product Manufacturer specifications are provided in Appendix 5.

The project's Professional Engineer licensed by the State of New York will have primary direct responsibility for overseeing the implementation of the vapor barrier. The Remedial Action Report will include photographs (maximum of two photos per page) of the installation process, PE/RA certified letter (on company letterhead) from primary contractor responsible for installation oversight and field inspections, and a copy of the manufacturers certificate of warranty.

Sub-Slab Depressurization System

No sub-slab depressurization system will be installed as part of this remedy

High Volume Ventilation of Parking Area

Potential soil vapor intrusion will also be mitigated by installing a high volume air exchange in the sub grade parking area as part of construction to meet the NYC Building Code.

4.4 INSTITUTIONAL CONTROLS

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

Institutional Controls for this remedial action are:

- The property will continue to be registered with an E-Designation at the NYC Buildings Department. This RAWP includes a description of all ECs and ICs and summarizes the requirements of the Site Management Plan which will note that the property owner and property owner's successors and assigns must comply with the approved SMP;
- Submittal of a Site Management Plan in the RAR for approval by OER that provides procedures for appropriate operation, maintenance, inspection, reporting and certification of ECs. 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 determined 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 usage type: 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

Site Management is the last phase of remediation and begins with the approval of the Remedial Action Report and issuance of the Notice of Completion (NOC) for the Remedial Action. The Site Management Plan (SMP) describes appropriate methods and procedures to ensure implementation of all ECs and ICs that are required by this RAWP. The Site Management Plan is submitted as part of the RAR but will be written in a manner that allows its use as an independent document. Site Management continues until terminated in writing by OER. The property owner is responsible to ensure that all Site Management responsibilities defined in this RAWP and 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; and (3) inspection and certification of EC's and IC's.

Site management activities, reporting, and EC/IC certification will be scheduled by OER on a periodic basis to be established in the SMP and will be subject to review and modification by OER. The Site Management Plan will be based on a calendar year and certification reports will be due for submission to OER by July 31 of the year following the reporting period.

4.6 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

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

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

Known and Potential Sources

Historic fill is present on Site to a depth of 8 to 13 feet below grade. Based on the results of the Remedial Investigation Report, the contaminants of concern found are:

Soil:

- Seven SVOCs, all PAH compounds, including; benzo(a)anthracene , benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were detected above Restricted Residential Use SCOs; and
- Metals including; Arsenic, copper, lead, and magnesium were detected above Restricted Residential SCOs.

Groundwater:

- Trichloroethene (TCE) was detected and exceeded GQS;
- Metals including iron, manganese, and sodium were detected above GQS

Soil Vapor:

- Moderate levels of petroleum related VOCs were detected in all soil vapor samples; and
- Chlorinated VOCs including PCE and TCE were detected in all four soil vapor samples above the monitoring level ranges established within the State DOH soil vapor guidance matrix.

Nature, Extent, Fate and Transport of Contaminants

SVOCs and metals are present throughout the Site in the shallow soils associated with the historic fill material. Low concentrations of trichloroethene and metals appeared to be present in the shallow groundwater throughout the Site. Trichloroethene and tetrachloroethene soil vapor concentrations above the NYSDOH AGVs are present throughout the Site.

Potential Routes of Exposure

The five elements of an exposure pathway are: (1) a contaminant source; (2) contaminant release and transport mechanisms; (3) a point of exposure; (4) a route of exposure; and (5) a receptor population. An exposure pathway is considered complete when all five elements of an exposure pathway are documented. A potential exposure pathway exists when any one or more of the five elements comprising an exposure pathway cannot be documented. An exposure pathway may be eliminated from further evaluation when any one of the five elements comprising an exposure pathway has not existed in the past, does not exist in the present, and will never exist in the future. Three potential primary routes exist by which chemicals can enter the body:

- Ingestion of water, fill or soil;

- Inhalation of vapors and particulates; and
- Dermal contact with soil.

Existence of Human Health Exposure

Current Conditions: The potential for exposure to historic fill is limited due to an asphalt cap constructed over the entire lot. Groundwater is marginally contaminated but is not exposed at the Site, and because the Site is served by the public water supply and groundwater use for potable supply is prohibited, groundwater is not used at the Site and there is no potential exposure. Under current conditions, accumulation of soil vapor within the currently on-Site structures is feasible.

Construction/ Remediation Activities: Once redevelopment activities begin, construction 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 any exposed impacted soil, and fill. Similarly, off-Site receptors could be exposed to dust and vapors from on-Site activities. During construction, on-Site and off-Site exposures to contaminated dust from on-Site will be addressed through the Soil/Materials Management Plan, dust controls, and through the implementation of the Community Air-Monitoring Program and a Construction Health and Safety Plan.

Proposed Future Conditions: Under future remediated conditions, all soils in excess of Track 4 Site Specific SCOs will be removed. The Site will be fully capped, limiting potential direct exposure to soil and groundwater remaining in place. Potential post-remediation exposures to on-Site residents from soil vapors migrating on-Site from an off-Site source remain a concern after the remedial action. A waterproofing membrane/vapor barrier system and passive SSDS system will prevent any exposure to existing and potential soil vapors in the future and any potential intrusion will be mitigated by a high volume air exchange in the basement parking area. The Site is served by a public water supply, and groundwater is not used at the Site for potable supply. There are no plausible off-Site pathways for ingestion, inhalation, or dermal exposure to contaminants derived from the Site under future conditions.

Receptor Populations

On-Site Receptors - The Site is currently a capped parking lot. Onsite receptors are limited to commuters, trespassers, and site representatives. During redevelopment of the Site, the on-Site potential receptors will include construction workers, site representatives, and visitors. Once the Site is redeveloped, the on-Site potential sensitive receptors will include adult and child building residents, workers and visitors.

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

1. Commercial Businesses (up to 0.25 mile) – existing and future
2. Residential Buildings (up to 0.25 mile) – existing and future
3. Building Construction/Renovation (up to 0.25 mile) – existing and future
4. Pedestrians, Trespassers, Cyclists (up to .25 mile) – existing and future
5. Schools (up to .25 mile) – existing and future

Overall Human Health Exposure Assessment

The QHHEA indicated that potential exposure pathways appear to exist only during the current unremediated phase and during the remedial action phase. There is no complete exposure pathway under future conditions after the site is developed. This assessment takes into consideration the reasonably anticipated use of the site, which includes a residential structure, site-wide impervious surface cover cap, and a subsurface vapor barrier system for the building. Potential post-construction use of groundwater is not considered an option because groundwater in this area of New York City is not used as a potable water source. During remedial construction, on-site and off-site exposures to dust from contaminated soils will be addressed through dust controls, and through the implementation of the community air monitoring program and a construction health and safety plan.

After the remedial action is complete, there will be no remaining exposure pathways. The composite cover system, vapor barrier system, and long-term site management will prevent any remaining exposure pathways from being complete. As part of the development, a parking garage at the base level of the building will be ventilated in conformance with NYC Building

Code. This construction activity will prevent migration of fugitive soil vapors from entering the building.

5.0 REMEDIAL ACTION MANAGEMENT

5.1 PROJECT ORGANIZATION AND OVERSIGHT

Principal personnel who will participate in the remedial action include Jed A. Myers, Ph.D., Senior Project Manager of Cardno ATC, and John Mascioli, M.S., Project Manager of Cardno ATC. The aforementioned personnel will provide oversight and consultation regarding the remedial action. Messrs. Robert Harrington, CIH, Senior Project Manager of Cardno ATC and Michael Donovan, CIH, Senior Project Manager of Cardno ATC will provide consultation regarding the CAMP. There may be additional personnel to perform air monitoring and particulate monitoring during the construction phase. The Professional Engineer (PE) for this project is Mr. Gilbert Gedeon, P.E., Division Manager of Cardno ATC.

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 remedial construction will be from 7:00 to 4:00. These hours conform to the New York City Department of Buildings construction code requirements.

5.4 CONSTRUCTION HEALTH AND SAFETY PLAN

The Health and Safety Plan is included in Appendix 4. The Site Safety Coordinator will be identified by the general contractor, TRM Contracting LLC. Remedial work performed under this RAWP will be in full compliance with applicable health and safety laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements. Confined space entry, if any, will comply with OSHA requirements and industry standards and will address potential risks. The parties performing the remedial construction work will ensure that performance of work is in compliance with the HASP and applicable laws and regulations. The HASP pertains to remedial and invasive work performed at the Site until the issuance of the Notice of Completion.

All field personnel involved in remedial activities will participate in training required under 29 CFR 1910.120, including 40-hour hazardous waste operator training and annual 8-hour refresher training. Site Safety Officer will be responsible for maintaining workers training records.

Personnel entering any exclusion zone will be trained in the provisions of the HASP and be required to sign an HASP acknowledgment. Site-specific training will be provided to field personnel. Additional safety training may be added depending on the tasks performed. Emergency telephone numbers will be posted at the site location before any remedial work begins. A safety meeting will be conducted before each shift begins. Topics to be discussed include task hazards and protective measures (physical, chemical, environmental); emergency procedures; PPE levels and other relevant safety topics. Meetings will be documented in a log book or specific form.

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

5.5 COMMUNITY AIR MONITORING PLAN

Real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the exclusion zone or work area will be performed. 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 baling/purging, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park,

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

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

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

5.6 AGENCY APPROVALS

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

5.7 SITE PREPARATION

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 to assure safety. Utility companies and other responsible authorities will be contacted to locate and mark the locations, and a copy of the Markout Ticket will be retained by the contractor prior to the start of drilling, excavation or other invasive subsurface operations. Overhead utilities may also be present within the anticipated work zones. Electrical hazards associated with drilling in the vicinity of overhead utilities will be prevented by maintaining a safe distance between overhead power lines and drill rig masts.

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

Dewatering

No dewatering is anticipated during the construction of the proposed building.

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 roads or use of stone or other aggregate-based egress paths between the truck inspection station and the property exit. Measures will be taken to ensure that adjacent roadways will be kept clean of project related soils, fill and debris.

Truck Inspection Station

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

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 holes, trenches and depressions on the property to high ground or removed from the property; an inventory of the property with photographs will be performed to establish conditions for the site and equipment prior to the event; stockpile covers for soil and fill will be secured by adding weights such as sandbags for added security and worn or ripped stockpile covers will be replaced with competent covers; stockpiled hazardous wastes will be removed from the property; stormwater management systems will be inspected and fortified, including, as necessary: clean and reposition silt fences, 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. Storm-water control systems and structures will be inspected and maintained as necessary. If soil or fill materials are discharged off site to adjacent properties, property owners and OER will be notified and

corrective measure plan designed to remove and clean dislocated material will be submitted to OER and implemented following approval by OER and granting of site access by the property owner. Impacted 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. 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) and will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the OER project manager and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number. Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the site; estimates of the volume of soil that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of onsite or offsite exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYS DEC; description of corrective actions; schedule for corrective actions. This report should be completed and submitted to OER project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

5.8 TRAFFIC CONTROL

Drivers of trucks leaving the NYC VCP Site with soil/fill will be instructed to proceed without stopping in the vicinity of the site to prevent neighborhood impacts. The planned route on local roads for trucks leaving the site will be determined once the final disposal site is identified.

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 day. Those reports will include:

- Project number and statement of the activities and an update of progress made and locations of work performed;
- Quantities of material imported and exported from the Site;

- Status of on-Site soil/fill stockpiles;
- A summary of all citizen complaints, with relevant details (basis of complaint; actions taken; etc.);
- A summary of CAMP excursions, if any;
- Photograph of notable Site conditions and activities.

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

Record Keeping and Photo-Documentation

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

5.11 COMPLAINT MANAGEMENT

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

5.12 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

All changes to the RAWP will be reported to the OER Project Manager and will be documented in daily reports and reported in the Remedial Action Report. The process to be followed if there are any deviations from the RAWP will include a request for approval for the change from OER noting the following:

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

6.0 REMEDIAL ACTION REPORT

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

- Information required by this RAWP;
- As-built drawings for all constructed remedial elements, required certifications, manifests and other written and photographic documentation of remedial work performed under this remedy;
- Site Management Plan;
- Description of any changes in the remedial action from the elements provided in this RAWP and associated design documents;
- Tabular summary of all end point sampling results and all material characterization results, QA/QC results for end-point sampling, and other sampling and chemical analysis performed as part of the remedial action and DUSR;
- Test results or other evidence demonstrating that remedial systems are functioning properly;
- Account of the source area locations and characteristics of all contaminated material removed from the Site including a map showing source areas;
- Account of the disposal destination of all contaminated material removed from the Site. Documentation associated with disposal of all material will include transportation and disposal records, and letters approving receipt of the material.
- Account of the origin and required chemical quality testing for material imported onto the Site.
- Continue registration of the property with an E-Designation at the NYC Department of Buildings.

- Reports and supporting material will be submitted in digital form.

Remedial Action Report Certification

The following certification will appear in front of the Executive Summary of the Remedial Action Report. The certification will include the following statements:

I, Gilbert Gedeon, am currently a professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the Dumbo 177 Front Street Site 14CVCP180K.

I, Jed A. Myers, Ph.D., am a qualified Environmental Professional. I had primary direct responsibility for implementation remedial program for the Dumbo 177 Front Street Site 14CVCP180K.

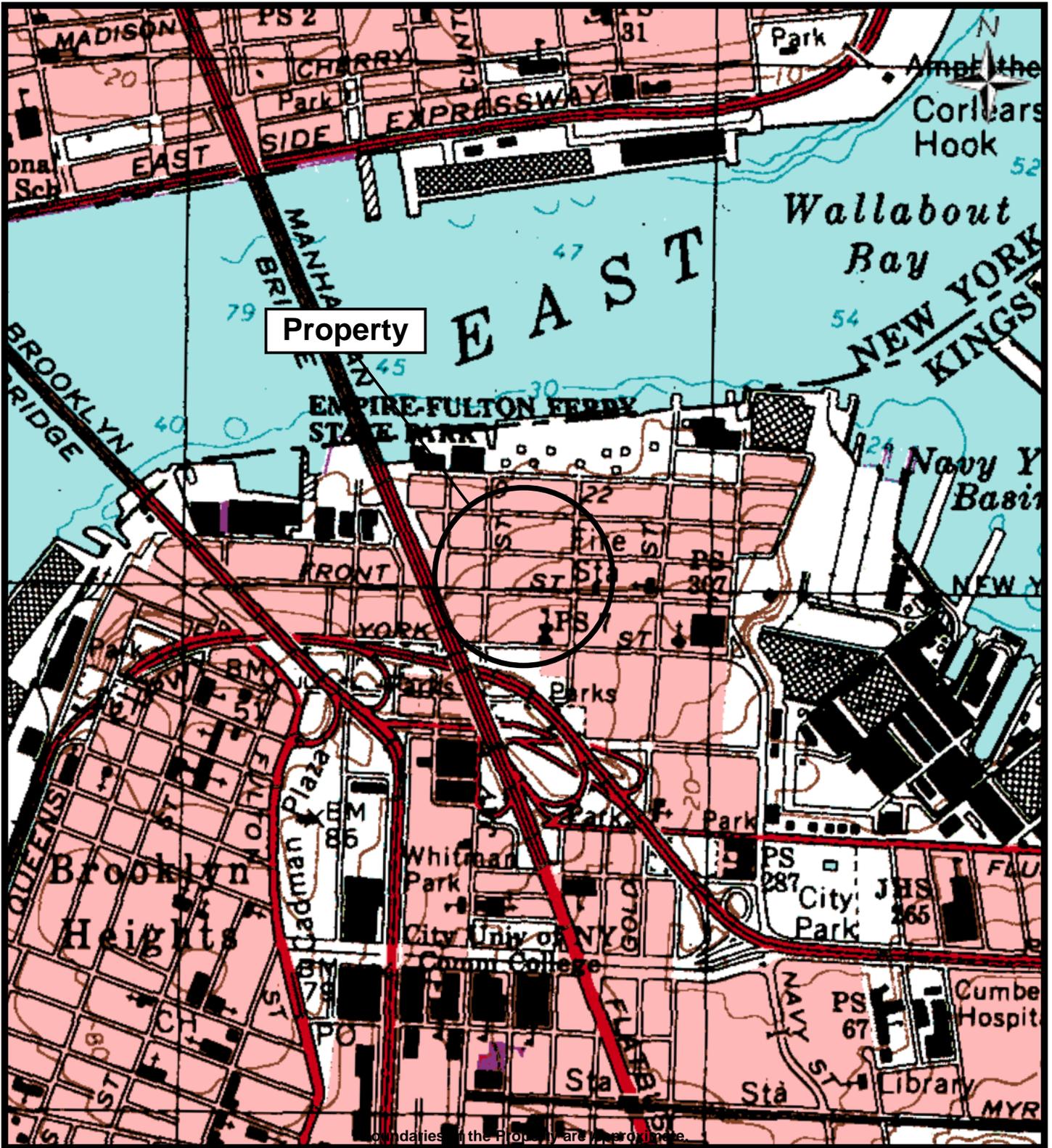
I certify that the OER-approved Remedial Action Work Plan dated month day year and Stipulations in a letter dated month day, year; were implemented and that all requirements in those documents have been substantively complied with. I certify that contaminated soil, fill, liquids or other material from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

7.0 SCHEDULE

The table below presents a schedule for the proposed remedial action and reporting. If the schedule for remediation and development activities changes, it will be updated and submitted to OER. Currently, a 15 month remediation period is anticipated.

Schedule Milestone	Weeks from Remedial Action Start	Duration (weeks)
OER Approval of RAWP	0	-
Fact Sheet 2 announcing start of remedy	0	-
Mobilization	1	8
Remedial Excavation	9	6
Demobilization	48	4
Submit Remedial Action Report	52	4

FIGURES



Boundaries in the Property are approximate.



**FIGURE 1 - SITE LOCATION MAP
DUMBO ASSEMBLAGE**

185 Front Street, 177 Front Street, and 173 Front Street
Brooklyn, NY 11201

PREPARED FOR: Dumbo Assemblage LLC

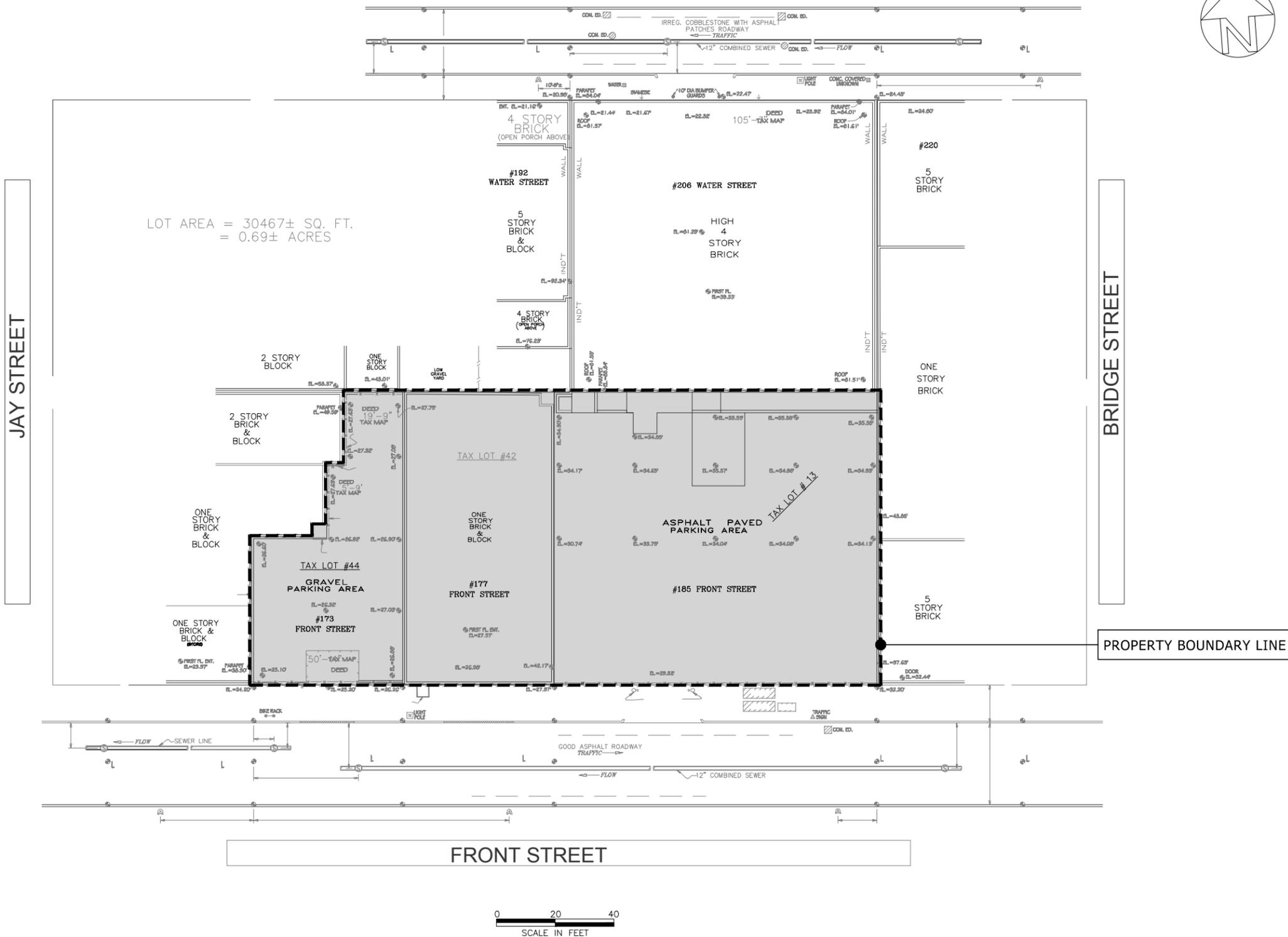
PROJ. MGR: Jed Myers

DRAWN BY: Jed Myers

DATE: 8/20/2013

PROJ. #: 15.44291.0004

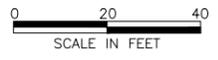
WATER STREET



LOT AREA = 30467± SQ. FT.
= 0.69± ACRES

PROPERTY BOUNDARY LINE

FRONT STREET



CLIENT:
DUMBO ASSEMBLAGE LLC
ADDRESS:
22 CORTLAND STREET
16TH FLOOR
NEW YORK, NY 10007

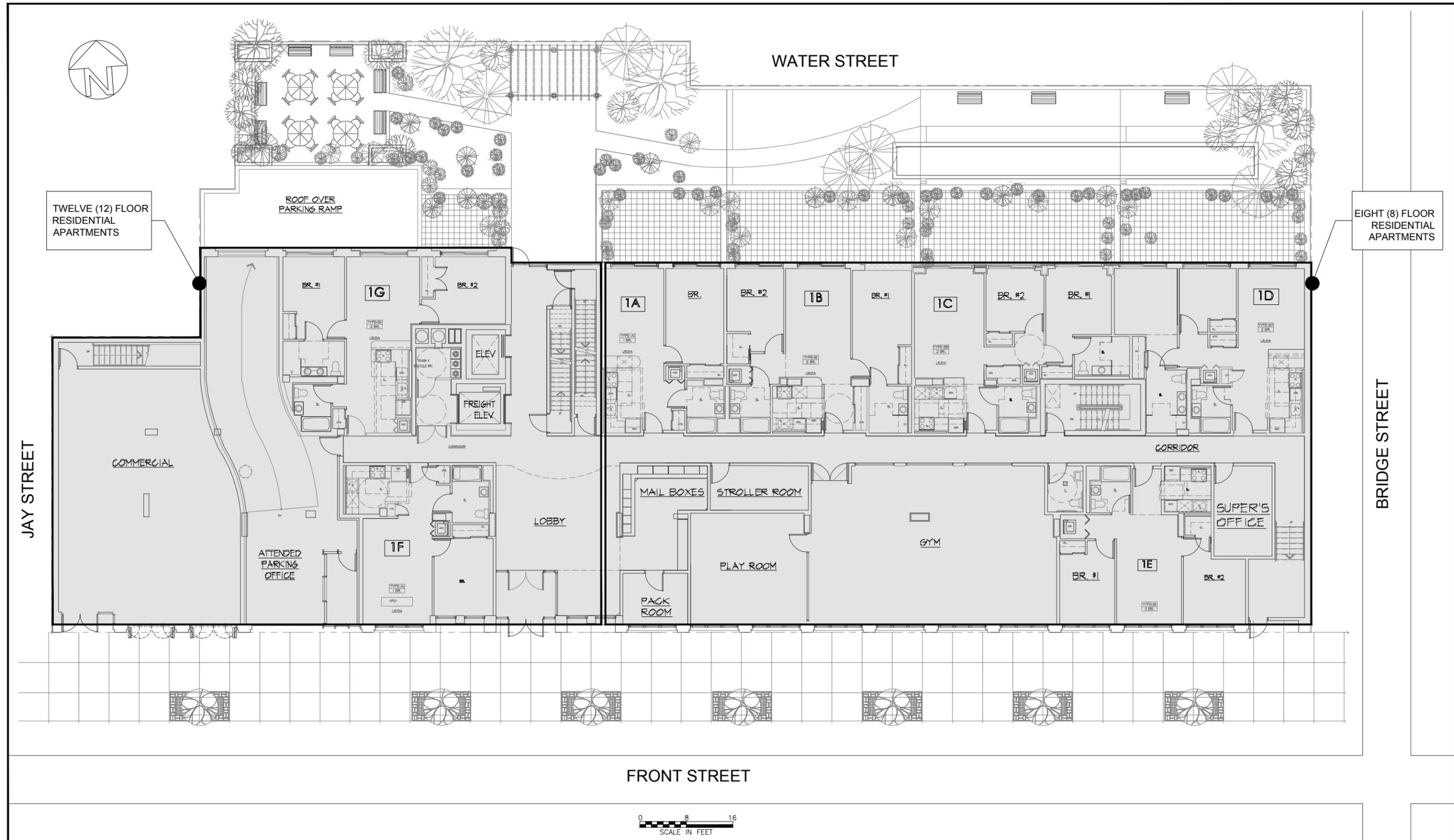
SITE ADDRESS:
173, 177 AND 185 FRONT STREET
BROOKLYN, NY 11201


**Cardno
ATC**
Shaping the Future
104 EAST 25th STREET, 10th FLOOR NEW YORK, NY 10010
TEL: (212) 353-8280 FAX: (212) 353-8306

DRAWING BY: M. SVERDEL
INSPECTED BY: J. MYERS
DESIGNED BY: J. MYERS
CHECKED BY:

DRAWING TITLE:
SITE PLAN
SCALE
SEE SCALE BAR
ATC PROJECT: # 15.44291.0004

DRAWING NO.
FIG-2
SHT. OF
DATE: 08.25.13
REVISION No. 0



TWELVE (12) FLOOR
RESIDENTIAL
APARTMENTS

EIGHT (8) FLOOR
RESIDENTIAL
APARTMENTS

JAY STREET

BRIDGE STREET

WATER STREET

FRONT STREET



CLIENT:
DUMBO ASSEMBLAGE LLC
ADDRESS:
22 CORTLAND STREET
16TH FLOOR
NEW YORK, NY 10007

SITE ADDRESS:
173, 177 AND 185 FRONT STREET
BROOKLYN, NY 11201

**Cardno
ATC**
Shaping the Future
104 EAST 25th STREET, 10th FLOOR NEW YORK, NY 10010
TEL: (212) 353-8280 FAX: (212) 353-8306

DRAWING BY: M. SVERDEL
INSPECTED BY: J. MYERS
DESIGNED BY: J. MYERS
CHECKED BY:

DRAWING TITLE:
PROPOSED REDEVELOPMENT PLAN
SHOWING FIRST FLOOR LAYOUT OF 12
STORY BUILDING

SCALE
SEE SCALE BAR
ATC PROJECT: # 15.44291.0004

DRAWING NO.
FIG-3
SHT. OF
DATE: 08.25.13
REVISION No.
0



Source: <http://gis.nyc.gov/doitt/nycitymap/>



104 East 25th Street, 8th Floor
 New York, NY 10010-2917
 Phone (212) 353-8280 * Fax (212) 979-8447

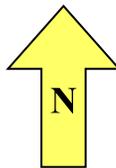


FIGURE 4 – Site Plan and Surrounding Land Use

Name: Dumbo Assemblage
Address: 173, 177 and 185 Front Street
 Brooklyn, New York 11211
Project No. 015.44291.0004

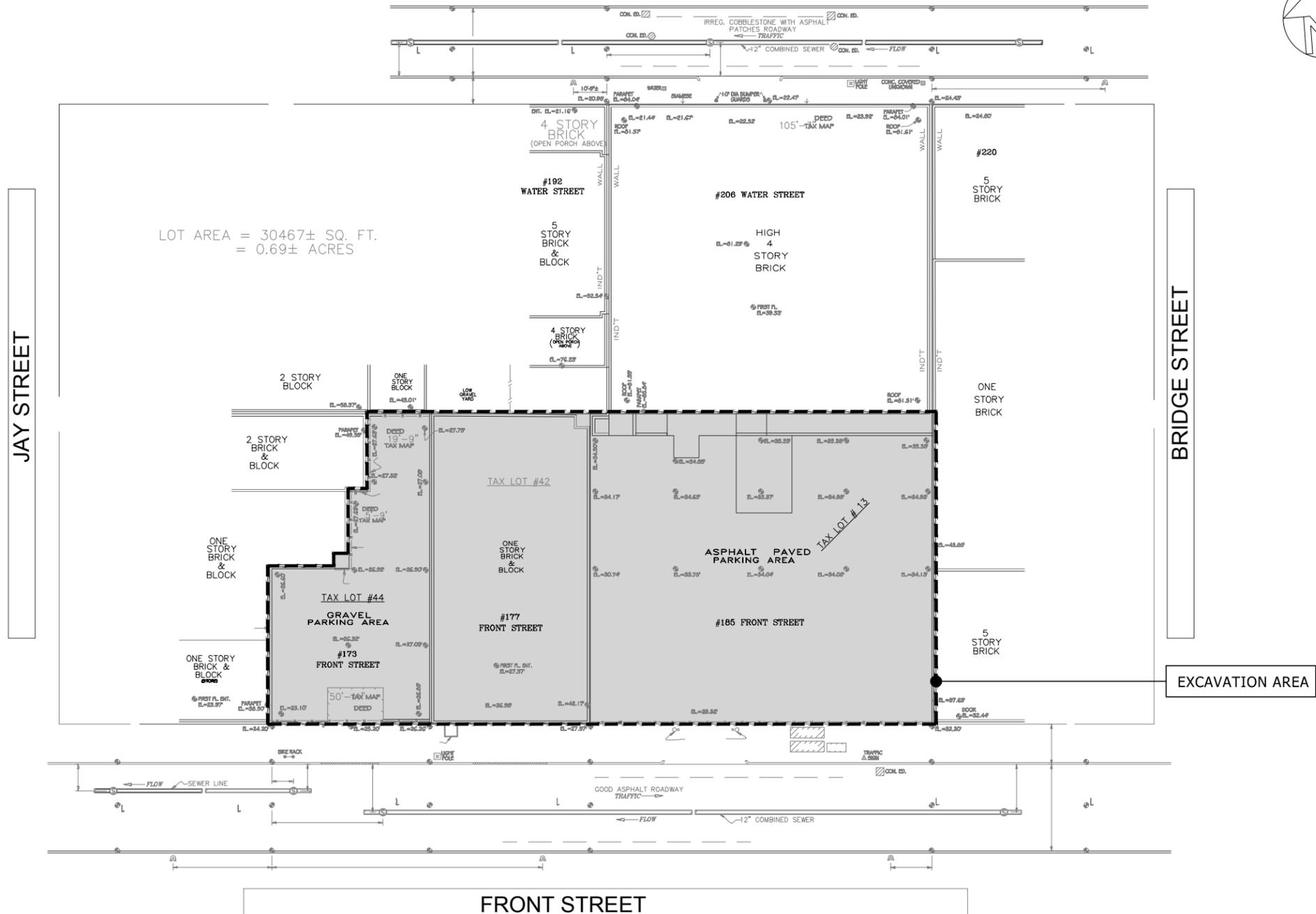
LEGEND:

- - - - - Property Boundary (approx.)
- - - - - Lot Lines (approx.)

Approximate Scale:



WATER STREET



FRONT STREET

CLIENT:
DUMBO ASSEMBLAGE LLC
ADDRESS: 22 CORTLAND STREET
16TH FLOOR
NEW YORK, NY 10007

SITE ADDRESS:
177 FRONT STREET
BROOKLYN, NY 11201

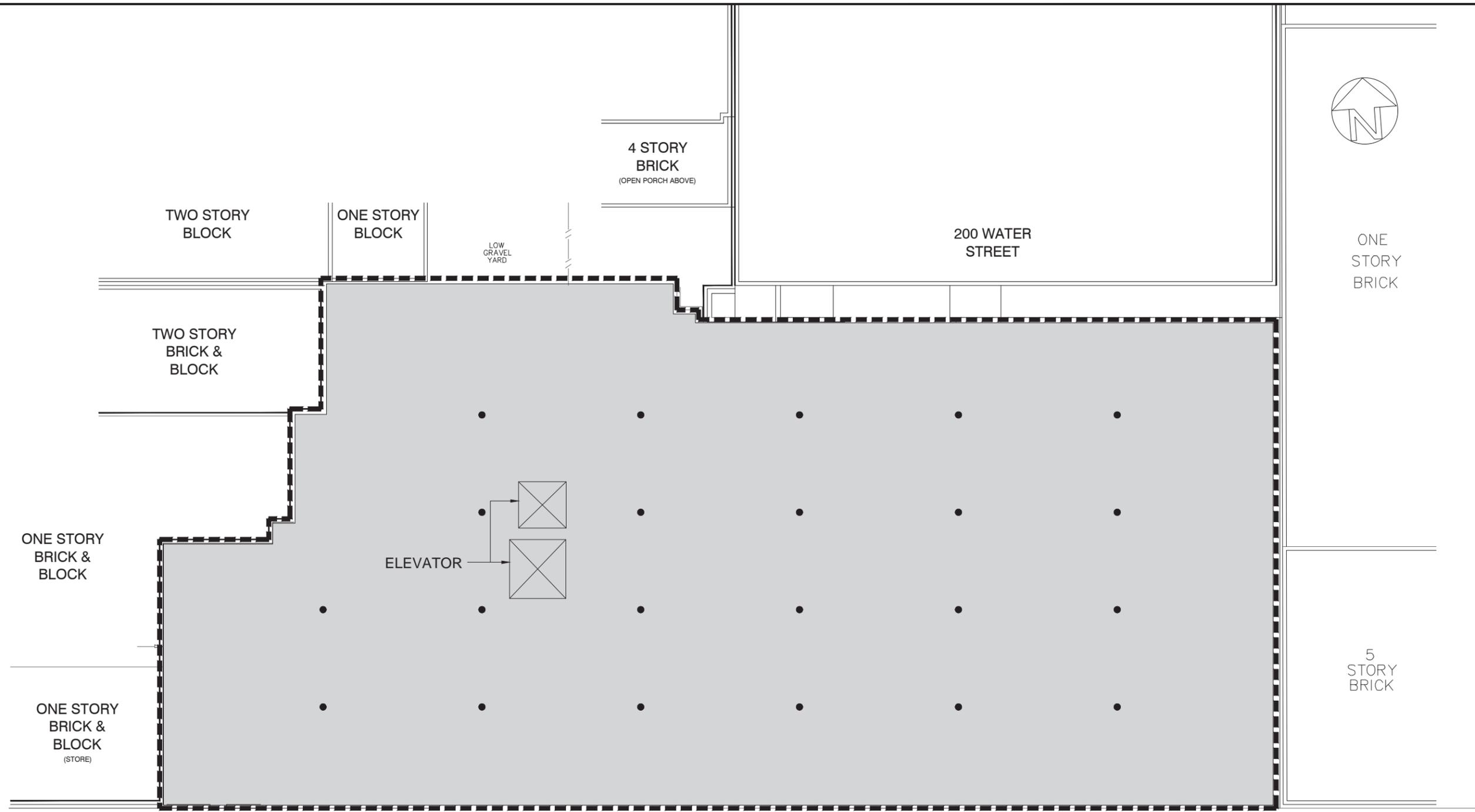

**Cardno
ATC**
Shaping the Future
104 EAST 25th STREET, 10th FLOOR NEW YORK, NY 10010
TEL: (212) 353-8280 FAX: (212) 353-8306

DRAWING BY: M. SVERDEL
INSPECTED BY: J. MYERS
DESIGNED BY: J. MYERS
CHECKED BY:

DRAWING TITLE:
LOCATION OF PLANNED
SOIL EXCAVATION

SCALE
SEE SCALE BAR
ATC PROJECT: # 15.44291.0004

DRAWING NO.
FIG-5
SHT. OF
DATE: 08.25.13
REVISION No.
0



APPROXIMATE END-POINT SOIL SAMPLING LOCATIONS

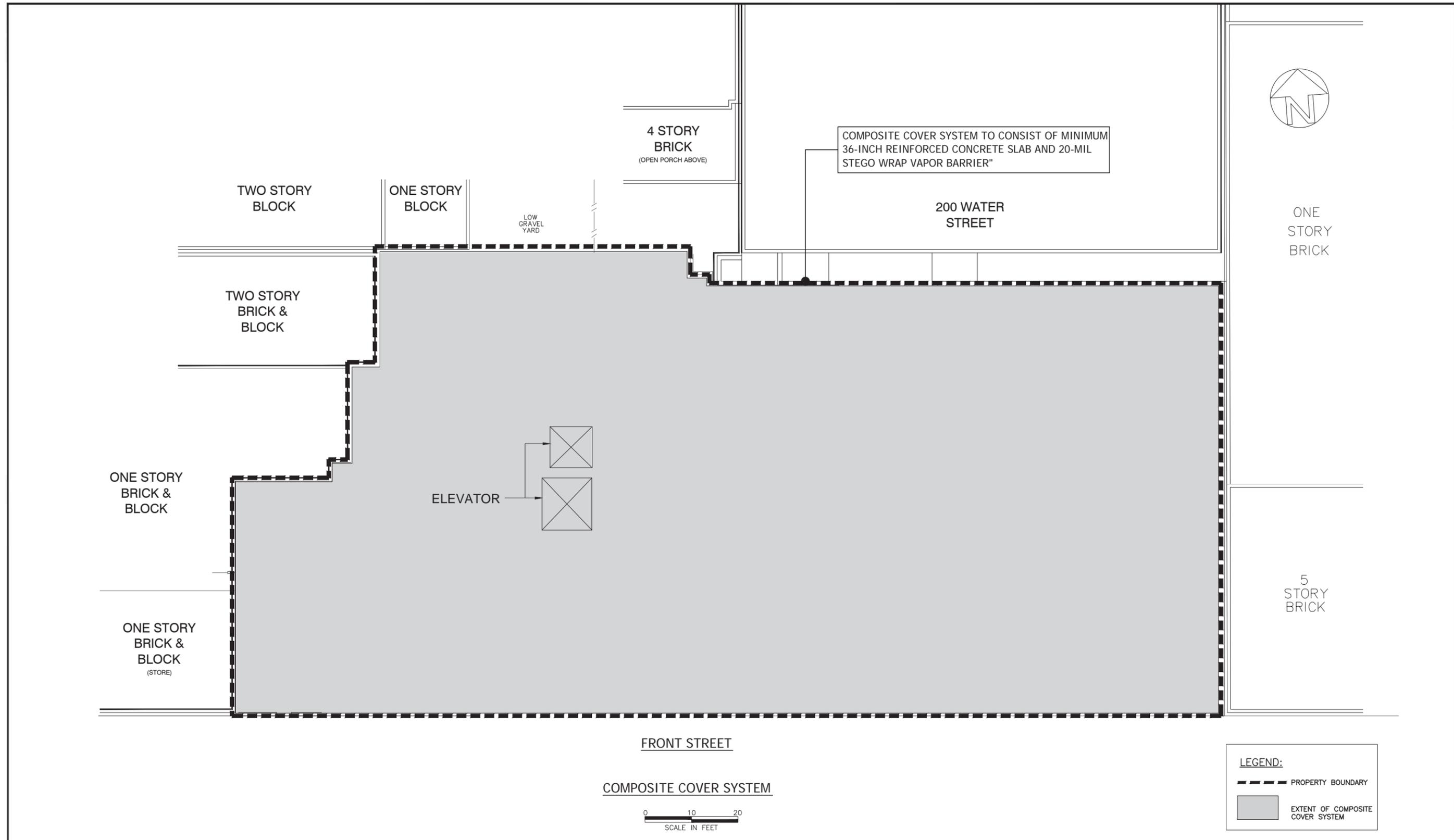


LEGEND:

- EXTENT OF EXCAVATION
- EXTENT OF COMPOSITE COVER SYSTEM
- END-POINT SOIL SAMPLE LOCATION (APPROXIMATE)

CLIENT: DUMBO ASSEMBLAGE LLC ADDRESS: 22 CORTLAND STREET 16TH FLOOR NEW YORK, NY 10007	SITE ADDRESS: 177 FRONT STREET BROOKLYN, NY 11201	Cardno ATC Shaping the Future <small>104 EAST 25th STREET, 10th FLOOR NEW YORK, NY 10010 TEL: (212) 353-8280 FAX: (212) 353-8306</small>	DRAWING BY: M. SVERDEL INSPECTED BY: J. MYERS DESIGNED BY: J. MYERS CHECKED BY:	DRAWING TITLE: END-POINT SOIL SAMPLING LOCATIONS SCALE SEE SCALE BAR	DRAWING NO. FIG-6 SH. OF DATE: 08.25.13 REVISION No. 0
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ATC PROJECT: # 15.44291.0004



CLIENT:
DUMBO ASSEMBLAGE LLC
 ADDRESS: 22 CORTLAND STREET
 16TH FLOOR
 NEW YORK, NY 10007

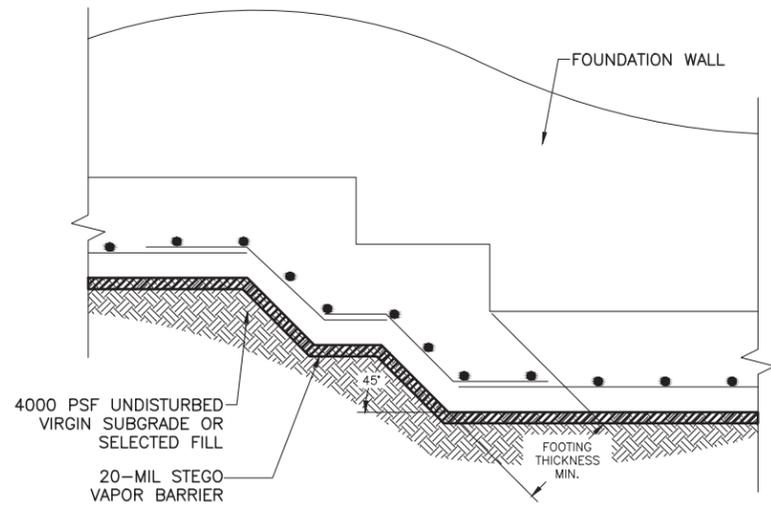
SITE ADDRESS:
 177 FRONT STREET
 BROOKLYN, NY 11201

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 104 EAST 25th STREET, 10th FLOOR NEW YORK, NY 10010
 TEL: (212) 353-8280 FAX: (212) 353-8306

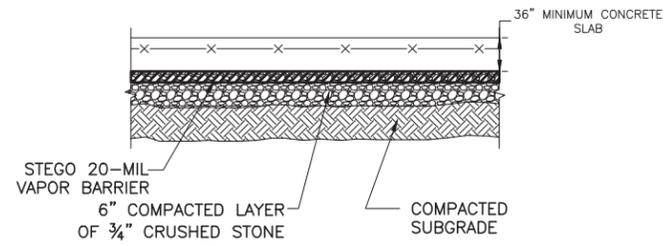
DRAWING BY: M. SVERDEL
 INSPECTED BY: J. MYERS
 DESIGNED BY: J. MYERS
 CHECKED BY:

DRAWING TITLE:
 COMPOSITE COVER SYSTEM
 SCALE: SEE SCALE BAR
 ATC PROJECT: # 15.44291.0004

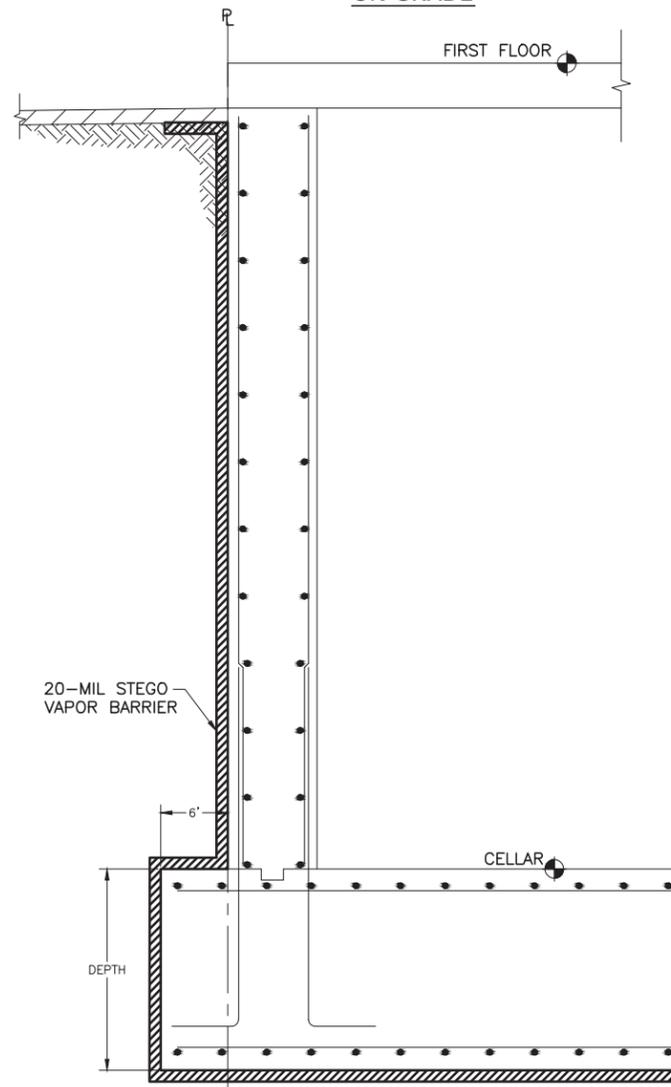
DRAWING NO. **FIG-7**
 SHEET OF
 DATE: 08.25.13
 REVISION No. 0



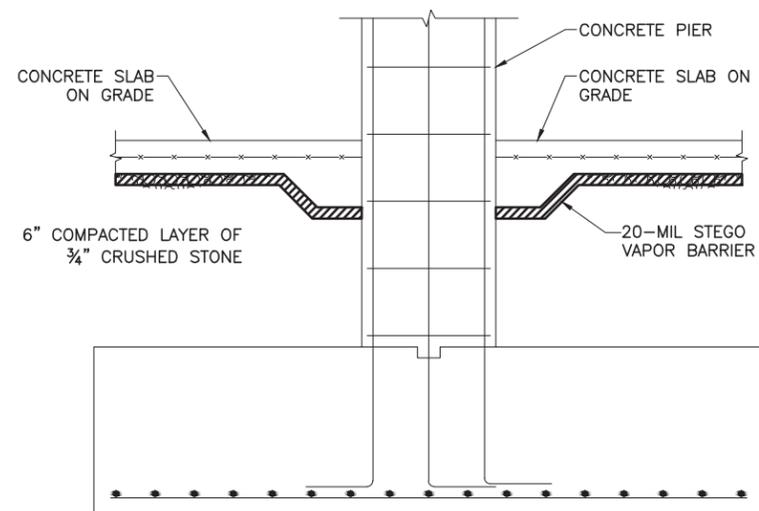
TYPICAL STEP FOOTING DETAIL



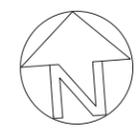
TYPICAL 36" CONCRETE SLAB ON GRADE



TYPICAL EXTERIOR WALL FOOTING



TYPICAL SPREAD FOOTING DETAIL



CLIENT:
DUMBO ASSEMBLAGE LLC
 ADDRESS: 22 CORTLAND STREET
 16TH FLOOR
 NEW YORK, NY 10007

SITE ADDRESS:
 177 FRONT STREET
 BROOKLYN, NY 11201

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DRAWING BY: M. SVERDEL
 INSPECTED BY: J. MYERS
 DESIGNED BY: J. MYERS
 CHECKED BY:

DRAWING TITLE:
 VAPOR BARRIER DETAIL DRAWINGS
 SCALE: N.T.S.
 ATC PROJECT: # 15.44291.0004

DRAWING NO. **FIG-8**
 SHEET OF
 DATE: 08.25.13
 REVISION No. 0

TABLES

**TABLE 2
IMPORTED BACKFILL AND CLEAN SOIL LIMITS**

Contaminant	CAS NUMBER	Protection of Public Health			
		Residential	Restricted Residential	Commercial	Industrial
METALS					
Arsenic	7440-38-2	16 ^f	16 ^f	16 ^f	16 ^f
Barium	7440-39-3	350 ^f	400	400	10,000 ^d
Beryllium	7440-41-7	14	72	590	2,700
Cadmium	7440-43-9	2.5 ^f	4.3	9.3	60
Chromium, hexavalent ^h	18540-29-9	22	110	400	800
Chromium, trivalent ^h	16065-83-1	36	180	1,500	6,800
Copper	7440-50-8	270	270	270	10,000 ^d
Total Cyanide ^h		27	27	27	10,000 ^d
Lead	7439-92-1	400	400	1,000	3,900
Manganese	7439-96-5	2,000 ^f	2,000 ^f	10,000 ^d	10,000 ^d
Total Mercury		0.81 ⁱ	0.81 ⁱ	2.8 ^j	5.7 ^j
Nickel	7440-02-0	140	310	310	10,000 ^d
Selenium	7782-49-2	36	180	1,500	6,800
Silver	7440-22-4	36	180	1,500	6,800
Zinc	7440-66-6	2200	10,000 ^d	10,000 ^d	10,000 ^d
PCBs/PESTICIDES					
2,4,5-TP Acid (Silvex)	93-72-1	58	100 ^a	500 ^b	1,000 ^c
4,4'-DDE	72-55-9	1.8	8.9	62	120
4,4'-DDT	50-29-3	1.7	7.9	47	94
4,4'-DDD	72-54-8	2.6	13	92	180
Aldrin	309-00-2	0.019	0.097	0.68	1.4
alpha-BHC	319-84-6	0.097	0.48	3.4	6.8
beta-BHC	319-85-7	0.072	0.36	3	14
Chlordane (alpha)	5103-71-9	0.91	4.2	24	47
delta-BHC	319-86-8	100 ^a	100 ^a	500 ^b	1,000 ^c
Dibenzofuran	132-64-9	14	59	350	1,000 ^c
Dieldrin	60-57-1	0.039	0.2	1.4	2.8
Endosulfan I	959-98-8	4.8 ⁱ	24 ⁱ	200 ⁱ	920 ⁱ
Endosulfan II	33213-65-9	4.8 ⁱ	24 ⁱ	200 ⁱ	920 ⁱ
Endosulfan sulfate	1031-07-8	4.8 ⁱ	24 ⁱ	200 ⁱ	920 ⁱ
Endrin	72-20-8	2.2	11	89	410
Heptachlor	76-44-8	0.42	2.1	15	29
Lindane	58-89-9	0.28	1.3	9.2	23
Polychlorinated biphenyls	1336-36-3	1	1	1	25
SEMIVOLATILES					
Acenaphthene	83-32-9	100 ^a	100 ^a	500 ^b	1,000 ^c
Acenaphthylene	208-96-8	100 ^a	100 ^a	500 ^b	1,000 ^c
Anthracene	120-12-7	100 ^a	100 ^a	500 ^b	1,000 ^c
Benz(a)anthracene	56-55-3	1 ^f	1 ^f	5.6	11
Benzo(a)pyrene	50-32-8	1 ^f	1 ^f	1 ^f	1.1
Benzo(b)fluoranthene	205-99-2	1 ^f	1 ^f	5.6	11
Benzo(g,h,i)perylene	191-24-2	100 ^a	100 ^a	500 ^b	1,000 ^c

**TABLE 2
IMPORTED BACKFILL AND CLEAN SOIL LIMITS**

Contaminant	CAS NUMBER	Protection of Public Health			
		Residential	Restricted Residential	Commercial	Industrial
Benzo(k)fluoranthene	207-08-9	1	3.9	56	110
Chrysene	218-01-9	1 ^f	3.9	56	110
Dibenz(a,h)anthracene	53-70-3	0.33 ^e	0.33 ^e	0.56	1.1
Fluoranthene	206-44-0	100 ^a	100 ^a	500 ^b	1,000 ^c
Fluorene	86-73-7	100 ^a	100 ^a	500 ^b	1,000 ^c
Indeno(1,2,3-cd)pyrene	193-39-5	0.5 ^f	0.5 ^f	5.6	11
m-Cresol	108-39-4	100 ^a	100 ^a	500 ^b	1,000 ^c
Naphthalene	91-20-3	100 ^a	100 ^a	500 ^b	1,000 ^c
o-Cresol	95-48-7	100 ^a	100 ^a	500 ^b	1,000 ^c
p-Cresol	106-44-5	34	100 ^a	500 ^b	1,000 ^c
Pentachlorophenol	87-86-5	2.4	6.7	6.7	55
Phenanthrene	85-01-8	100 ^a	100 ^a	500 ^b	1,000 ^c
Phenol	108-95-2	100 ^a	100 ^a	500 ^b	1,000 ^c
Pyrene	129-00-0	100 ^a	100 ^a	500 ^b	1,000 ^c
VOLATILES					
1,1,1-Trichloroethane	71-55-6	100 ^a	100 ^a	500 ^b	1,000 ^c
1,1-Dichloroethane	75-34-3	19	26	240	480
1,1-Dichloroethene	75-35-4	100 ^a	100 ^a	500 ^b	1,000 ^c
1,2-Dichlorobenzene	95-50-1	100 ^a	100 ^a	500 ^b	1,000 ^c
1,2-Dichloroethane	107-06-2	2.3	3.1	30	60
cis-1,2-Dichloroethene	156-59-2	59	100 ^a	500 ^b	1,000 ^c
trans-1,2-Dichloroethene	156-60-5	100 ^a	100 ^a	500 ^b	1,000 ^c
1,3-Dichlorobenzene	541-73-1	17	49	280	560
1,4-Dichlorobenzene	106-46-7	9.8	13	130	250
1,4-Dioxane	123-91-1	9.8	13	130	250
Acetone	67-64-1	100 ^a	100 ^b	500 ^b	1,000 ^c
Benzene	71-43-2	2.9	4.8	44	89
Butylbenzene	104-51-8	100 ^a	100 ^a	500 ^b	1,000 ^c
Carbon tetrachloride	56-23-5	1.4	2.4	22	44
Chlorobenzene	108-90-7	100 ^a	100 ^a	500 ^b	1,000 ^c
Chloroform	67-66-3	10	49	350	700
Ethylbenzene	100-41-4	30	41	390	780
Hexachlorobenzene	118-74-1	0.33 ^e	1.2	6	12
Methyl ethyl ketone	78-93-3	100 ^a	100 ^a	500 ^b	1,000 ^c
Methyl tert-butyl ether	1634-04-4	62	100 ^a	500 ^b	1,000 ^c
Methylene chloride	75-09-2	51	100 ^a	500 ^b	1,000 ^c
n-Propylbenzene	103-65-1	100 ^a	100 ^a	500 ^b	1,000 ^c
sec-Butylbenzene	135-98-8	100 ^a	100 ^a	500 ^b	1,000 ^c
tert-Butylbenzene	98-06-6	100 ^a	100 ^a	500 ^b	1,000 ^c
Tetrachloroethene	127-18-4	5.5	19	150	300
Toluene	108-88-3	100 ^a	100 ^a	500 ^b	1,000 ^c

**TABLE 2
IMPORTED BACKFILL AND CLEAN SOIL LIMITS**

Contaminant	CAS NUMBER	Protection of Public Health			
		Residential	Restricted Residential	Commercial	Industrial
Trichloroethene	79-01-6	10	21	200	400
1,2,4-Trimethylbenzene	95-63-6	47	52	190	380
1,3,5-Trimethylbenzene	108-67-8	47	52	190	380
Vinyl chloride	75-01-4	0.21	0.9	13	27
Xylene (mixed)	1330-20-7	100 ^a	100 ^a	500 ^b	1,000 ^c

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

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

See TSD section 9.3.

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

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

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

^e For constituents where the calculated SCO was lower than the contract required quantitation limit (CRQL),

the CRQL is used as the SCO value.

^f For constituents where the calculated SCO was lower than the rural soil background concentration as determined by the Department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.

^g This SCO is derived from data on mixed isomers of BHC.

^h The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

ⁱ This SCO is for the sum of endosulfan I, endosulfan II, and endosulfan sulfate.

^j This SCO is the lower of the values for mercury (elemental) or mercury (inorganic salts). See TSD Table 5.6-1.

APPENDIX 1

CITIZEN PARTICIPATION PLAN

The NYC Office of Environmental Remediation and Dumbo Assemblage 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, Dumbo Assemblage 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, Rebecca Bub, 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.

Repositories. A document repository is maintained in the nearest public library that maintains evening and weekend hours. This document repository is intended to house, for community review, all principal documents generated during the cleanup program including Remedial Investigation plans and reports, Remedial Action work plans and reports, and all public notices and fact sheets produced during the lifetime of the remedial project. Dumbo Assemblage LLC will inspect the repositories to ensure that they are fully populated with project information. The repository for this project is:

Brooklyn Heights Library

280 Cadman Plaza, Brooklyn, NY 11201

718-623-7100

Hours of Operation: Monday – Friday 8:00 to 1:00; Saturday 9:00 to 1:00; Sunday closed

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

Identify Issues of Public Concern. Enrollee is not aware of any issues of public concern at the present time.

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

Citizen Participation Milestones. Public notice and public comment activities occur at several steps during a typical NYC VCP project. 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 2

SUSTAINABILITY STATEMENT

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

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

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

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

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

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

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

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

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

Recontamination Control. Recontamination after cleanup and redevelopment is completed undermines the value of work performed, may result in a property that is less protective of public health or the environment, and may necessitate additional cleanup work later or impede future redevelopment. Recontamination can arise from future releases that occur within the property or by influx of contamination from off-Site.

An estimate of the area of the Site that utilizes recontamination controls under this plan will be reported in the RAR in square feet.

Storm-water Retention. Storm-water retention improves water quality by lowering the rate of combined storm-water and sewer discharges to NYC's sewage treatment plants during periods of precipitation, and reduces the volume of untreated influent to local surface waters.

An estimate of the enhanced storm-water retention capability of the redevelopment project will be included in the RAR.

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

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

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

Low-Energy Project Management Program. Dumbo Assemblage 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 3

SOIL/MATERIALS MANAGEMENT PLAN

1.1 SOIL SCREENING METHODS

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

1.2 STOCKPILE METHODS

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

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

1.3 CHARACTERIZATION OF EXCAVATED MATERIALS

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

1.4 MATERIALS EXCAVATION, LOAD-OUT AND DEPARTURE

The PE/QEP overseeing the remedial action will:

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

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

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

1.5 OFF-SITE MATERIALS TRANSPORT

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

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

1.6 MATERIALS DISPOSAL OFF-SITE

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

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

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

Waste characterization will be performed for off-Site disposal in a manner required by the receiving facility and in conformance with its applicable permits. Waste characterization

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

1.7 MATERIALS REUSE ON-SITE

Soil and fill that is derived from the property that meets the soil cleanup objectives established in this plan may be reused on-Site. The soil cleanup objectives for on-Site reuse are listed in Table 1. 'Reuse on-Site' means material that is excavated during the remedy or development, does not leave the property, and is relocated within the same property and on comparable soil/fill material, and addressed pursuant to the NYC VCP agreement subject to Engineering and Institutional Controls. The PE/QEP will ensure that reused materials are segregated from other materials to be exported from the Site and that procedures defined for material reuse in this RAWP are followed. At the present time reuse of on-Site materials is not anticipated.

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 Table 2.

A process will be established to evaluate sources of backfill and cover soil to be imported to the Site, and will include an examination of source location, current and historical use(s), and any applicable documentation. Material from industrial sites, spill sites, environmental remediation sites or other potentially contaminated sites will not be imported to the Site.

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

- Clean soil from construction projects at non-industrial sites in compliance with applicable laws and regulations;
- Clean soil from roadway or other transportation-related projects in compliance with applicable laws and regulations;
- Clean recycled concrete aggregate (RCA) from facilities permitted or registered by the regulations of NYS DEC.

All materials received for import to the Site will be approved by a PE/QEP and will be in compliance with provisions in this RAWP. The RAR will report the source of the fill, evidence that an inspection was performed on the source, chemical sampling results, frequency of testing, and a Site map indicating the locations where backfill or soil cover was placed.

Source Screening and Testing

Inspection of imported fill material will include visual, olfactory and PID screening for evidence of contamination. Materials imported to the Site will be subject to inspection, as follows:

- Trucks with imported fill material will be in compliance with applicable laws and regulations and will enter the Site at designated locations;
- The PE/QEP is responsible to ensure that every truck load of imported material is inspected for evidence of contamination; and
- Fill material will be free of solid waste including pavement materials, debris, stumps, roots, and other organic matter, as well as ashes, oil, perishables or foreign matter.

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

Recycled concrete aggregate (RCA) will be imported from facilities permitted or registered by NYSDEC. Facilities will be identified in the RAR. A PE/QEP is responsible to ensure that the facility is compliant with 6NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA. RCA imported from compliant facilities will not require additional testing, unless required by NYSDEC under its terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete. RCA material is not acceptable for, and will not be used as cover material.

1.10 FLUIDS MANAGEMENT

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable laws and regulations. Liquids discharged into the New York City sewer system will receive prior approval by New York City Department of Environmental Protection (NYC DEP). The NYC DEP regulates discharges to the New York City sewers under Title 15, Rules of the City of New York Chapter 19. Discharge to the New York City sewer system will require an authorization and sampling data demonstrating that the

groundwater meets the City's discharge criteria. The dewatering fluid will be pretreated as necessary to meet the NYC DEP discharge criteria. If discharge to the City sewer system is not appropriate, the dewatering fluids will be managed by transportation and disposal at an off-Site treatment facility.

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

1.11 STORM-WATER POLLUTION PREVENTION

Applicable laws and regulations pertaining to storm-water pollution prevention will be addressed during the remedial program. Erosion and sediment control measures identified in this RAWP (silt fences and barriers, and hay bale checks) will be installed around the entire perimeter of the remedial construction area and inspected once a week and after every storm event to ensure that they are operating appropriately. Discharge locations will be inspected to determine whether erosion control measures are effective in preventing significant impacts to receptors. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by OER. All necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. Undercutting or erosion of the silt fence toe anchor will be repaired immediately with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

1.12 CONTINGENCY PLAN

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

Chemical analytical testing will be performed for TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs, as appropriate.

1.13 ODOR, DUST AND NUISANCE CONTROL

Odor Control

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

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

Dust Control

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

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

This dust control plan is capable of controlling emissions of dust. If nuisance dust emissions are identified, work will be halted and the source of dusts will be identified and

corrected. Work will not resume until all nuisance dust emissions have been abated. OER will be notified of all dust complaint events. Implementation of all dust controls, including halt of work, will be the responsibility of the PE/QEP's responsible for certifying the Remedial Action Report.

Other Nuisances

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

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

APPENDIX 4

PROPOSED DEVELOPMENT PLANS

PROPOSED NEW MIXED USE DEVELOPMENT FOR: DUMBO 177 FRONT STREET, BROOKLYN, NY 11201

DEVELOPER

DUMBO Associates LLC
22 Cortland St.
New York, NY 10007
tel.: 212.419.0567

ARCHITECT:

asap **Aufgang + Subotovsky**
Architecture and Planning
PLLC
49 North Airmont Road, Suffern, NY 10901
tel: 845.368.0004 www.asaparchitecture.com fax: 800.772.8304

STRUCTURAL ENGINEER:

BROOKER ENGINEERING, PLLC
76 LAFAYETTE AVENUE, SUFFERN, NEW YORK 10901 TEL: 845-357-4411 FAX: 845-357-1896

MECHANICAL ENGINEER:

ETTINGER ENGINEERING ASSOCIATES
CONSULTING ENGINEERS
505 BIGHTH AVE., NEW YORK, NEW YORK 10001
TEL: 212-244-2410 FAX: 212-643-1606



DRAWING SCHEDULE:

- T-001 COVER SHEET
- C-001 SURVEY
- C-100 SCHEMATIC SITE PLAN
- Z-001 ZONING ANALYSIS
- EN-001 ENERGY ANALYSIS

ARCHITECTURAL:

- A-001 GENERAL NOTES
- A-002 ACCESSIBILITY DIAGRAMS
- A-003 EGRESS PLANS
- A-100 CELLAR FLOOR PLAN
- A-101 1ST FLOOR PLAN
- A-102 2ND FLOOR PLAN
- A-103 3RD & 4TH FLOOR PLAN
- A-104 5TH & 6TH FLOOR PLAN
- A-105 7TH & 8TH FLOOR PLAN
- A-106 9TH FLOOR PLAN
- A-107 10TH - 12TH FLOOR PLAN
- A-200 FRONT ELEVATION
- A-201 REAR ELEVATION
- A-500 HPD APARTMENT LAYOUTS - A1 & A3
- A-501 HPD APARTMENT LAYOUTS - B1 & B12
- A-502 HPD APARTMENT LAYOUTS - C2 & C4

SOUTH EAST VIEW OF FRONT STREET
177 FRONT STREET
BLOCK #41 LOT #44, 42, & P/O 13

APARTMENT DISTRIBUTION						
MARKET RATE						
	1 BR.	1 BR + DEN	2 BR.	2BR + DEN	3 BR.	TOTAL
1ST FLOOR	1	0	0	0	0	0
2ND FLOOR	3	1	2	2	0	8
3RD FLOOR	4	1	2	2	0	9
4TH FLOOR	4	1	2	2	0	9
5TH FLOOR	4	1	3	2	1	11
6TH FLOOR	4	1	3	2	1	11
7TH FLOOR	0	1	6	1	1	9
8TH FLOOR	0	1	6	1	1	9
9TH FLOOR	0	1	0	0	2	3
10TH FLOOR	0	1	0	0	2	3
11TH FLOOR	0	1	0	0	2	3
12TH FLOOR	0	1	0	0	2	3
TOTAL	20	11	29	12	14	84
PERCENT	24%	13%	35%	14%	14%	100%

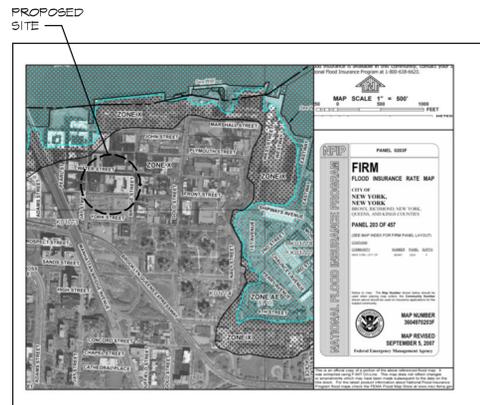
APARTMENT DISTRIBUTION					
AFFORDABLE					
	1 BR.	2 BR.	2BR + DEN	3 BR.	TOTAL
1ST FLOOR	1	0	0	0	1
2ND FLOOR	1	2	0	1	4
3RD FLOOR	1	2	0	1	4
4TH FLOOR	1	2	0	1	4
5TH FLOOR	1	1	0	0	2
6TH FLOOR	1	1	0	0	2
7TH FLOOR	1	1	0	0	2
8TH FLOOR	1	1	0	0	2
9TH FLOOR	1	1	0	0	2
TOTAL	8	10	0	3	21
PERCENT	38%	48%	0%	14%	100%

APARTMENT DISTRIBUTION

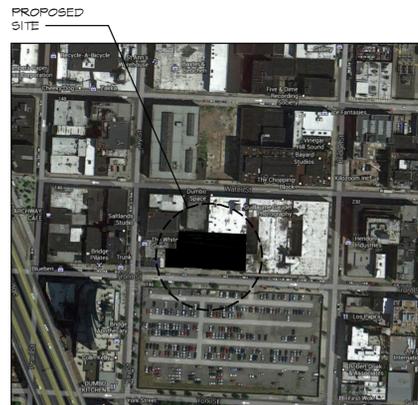
REQUIRED INCLUSIONARY LOW INCOME (HPD) APARTMENT COMPLIANCE: (ZR 23-96)

*20% OF TOTAL NUMBER OF APARTMENTS:
105 APT'S x 20% = 21 APT'S (REQUIRED)
21 APT'S (PROVIDED)

8 (1 BR.) + 10 (2 BR.) + 3 (3 BR.) = 21 APT'S (Z.R. 23-96(c)(1)(i))



FEMA FLOOD MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

50% DESIGN DEVELOPMENT PROGRESS SET
DRAWINGS ARE SUBJECT TO CHANGE

DATE: 08-01-13

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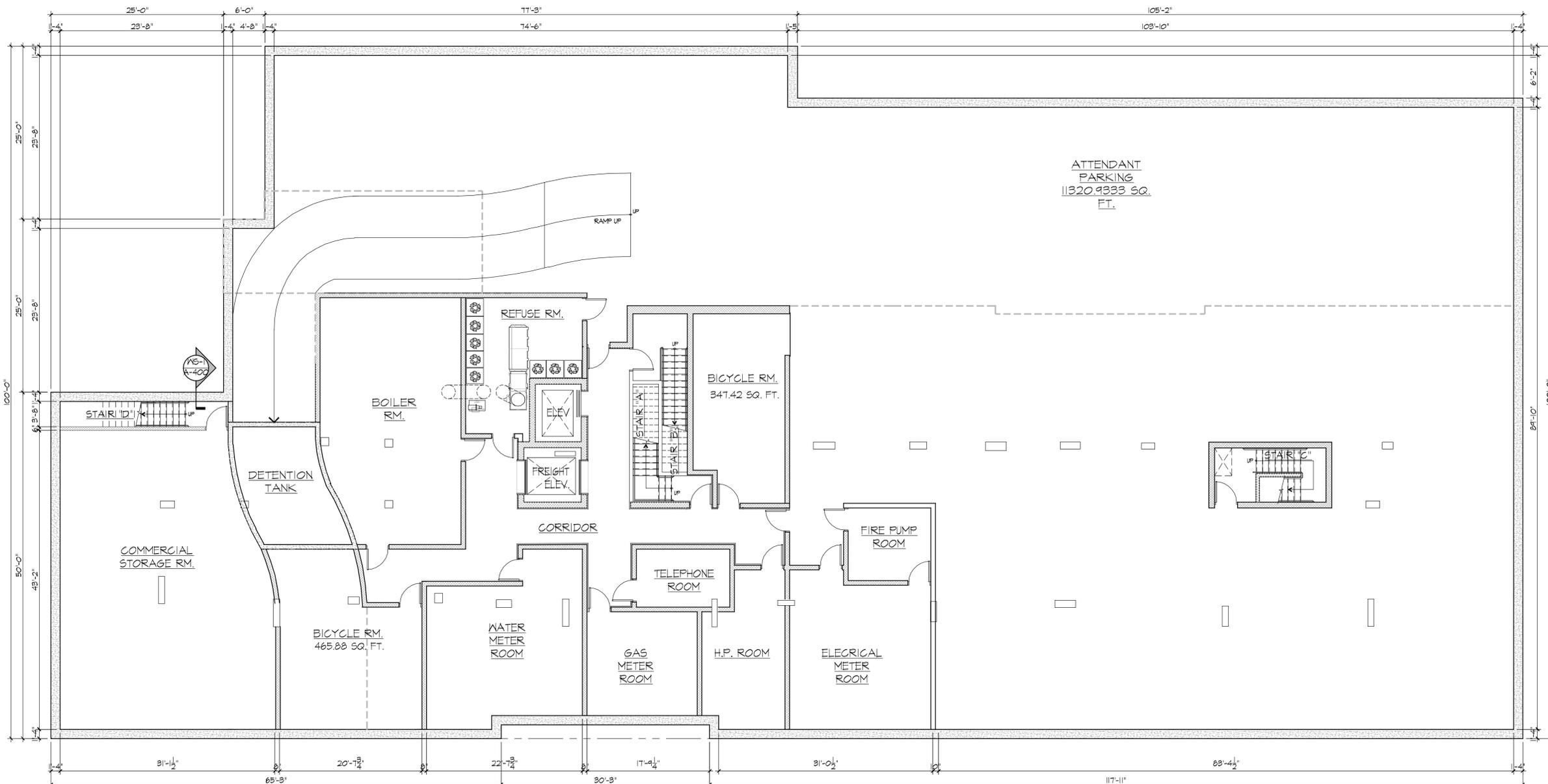
07-19-13	ISSUED TO HPD FOR REVIEW AND COMMENT
DATE	REVISIONS

asap **Aufgang + Subotovsky**
Architecture and Planning
PLLC
49 North Airmont Road, Suffern, NY 10901 tel: 845.368.0004 fax: 800.772.8304 www.asaparchitecture.com

PROPOSED NEW MIXED USE DEVELOPMENT FOR:
DUMBO
177 FRONT ST., BROOKLYN, NEW YORK 11201

FRONT STREET BUILDING
COVER SHEET

DATE:	07-19-13
PROJECT NO:	1314
DRAWN BY:	SCR
CHECKED BY:	PC
DRAWING NO:	T-001.00
SCALE:	AS NOTED
SHEET NO:	1 of 13
NYC DOB NUMBER:	



ATTENDANT
PARKING
11320.9333 SQ.
FT.

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

WALL TYPE LEGEND:

- NON RATED**
- ▲ FURRING AT INTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD OVER 1/2" METAL CHANNELS @ 16" O.C.
 - ▲ TYPICAL PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
 - ▲ BATHROOM CHASE WALL PARTITION - (1) LAYER 5/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ONE SIDE OF 3 3/8" METAL STUDS @ 16" O.C.
 - ▲ PARTITION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3 3/8" METAL STUDS @ 16" O.C. (APARTMENT ELECTRICAL PANEL)
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 3 3/8" GALV. METAL STUDS @ 16" O.C. WITH 3 1/2" (R-15) BATT INSULATION UNFACED
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C.
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C. WITH 1 1/2" SEMI-RIGID INSULATION (R-15) UNFACED

- 1 HOUR RATED**
- ▲ 1 HOUR RATED TENANT SEPARATION PARTITION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON (1) SIDE, (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD ON OTHER SIDE OF 3 3/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF CONCRETE DECK & SEAL TIGHT TO UNDERSIDE OF CONCRETE/METAL DECK AND/OR ROOF DECK W/ CONT. FIRESTOP SEALANT & FIRESAFING INSULATION (6A FILE #WP-1052) (STC 50-54)
 - ▲ 2 HOUR RATED
 - ▲ 2 HOUR RATED EXTERIOR PARTITION - (2) LAYERS OF 3/4" TYPE "X" GYPSUM BOARD, (INSIDE) 5/8" EXP EXTERIOR GYPSUM BOARD SHEATHING (OUTSIDE) OVER 3 3/8" 1 GA 18 GALV. METAL STUDS @ 16" O.C. WITH 3 1/2" BATT INSULATION (UNFACED) (R-15) (UL-424)
 - ▲ 2 HOUR RATED INTERIOR PARTITION - (2) LAYERS 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE 3 3/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND GYPSUM BOARD & STUDS UP TO UNDERSIDE OF FLOOR/METAL DECK OR ROOF DECK, SEAL TIGHT TO DECK W/ CONT. FIRESTOP SEALANT & FIRESAFING. (6A FILE #WP-1522 STC 55-59).
 - ▲ 2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE BLOCK COURSES, SEAL TOP OF CONCRETE/METAL BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE/METAL DECK OR DECK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXIST. BETWEEN TOP OF WALL AND BOTTOM OF DECK (UL #906)

- 2 HOUR RATED MECHANICAL SHAFT WALL - (2) LAYERS OF 1/2" TYPE "X" GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL C-H STUDS @ 24" O.C. WITH (1) LAYER OF 1" TYPE "X" GYPSUM LINER PANEL ON SHAFT SIDE W/ 1" MINERAL FIBER INSULATION IN CAVITY. SEAL TOP OF WALL TIGHT TO UNDERSIDE OF CONCRETE DECK W/ CONT. FIRESTOP SEALANT. 6A FILE #4035 (STC-45-49)**
- 3 HOUR RATED**
- ▲ 3 HOUR RATED WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD OVER 3/4" METAL HAT CHANNELS @ 24" O.C. OVER 2 HR RATED CONCRETE BLOCK WALL WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE COURSES. SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE/METAL FLOOR DECK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF CONCRETE/METAL DECK (UL #1414) (PROVIDE STC RATINGS OF 50-54 COMPACTOR CHUTE FOR SHAFT ADJACENT TO DWELLING UNITS)
- GENERAL NOTES:**
- FOR KITCHEN AND TOILET ELEVATIONS SEE DRAWING A-XXX.
 - G.C. SHALL COORDINATE SIZE & LOCATION OF ALL HVAC OPENINGS IN CONG/METAL DECK WITH MECHANICAL DRAWINGS.
 - CONTRACTOR SHALL COORDINATE SIZE AND LOCATION OF ALL MASONRY OPENINGS AT ELEVATOR ENTRANCES WITH ELEVATOR VENDOR.
 - ALL ENLARGED PLAN DIMENSIONS ARE TAKEN FINISH TO FINISH (U.O.N.).

- LEGEND:**
- CONCRETE FOUNDATION WALL
 - CONCRETE BLOCK WALL - 2HR FIRE RATED
 - GYPSUM BOARD PARTITION - SEE PLAN FOR SIZE
 - MASONRY VENEER
 - REMOVABLE KITCHEN BASE CABINET - 2'-0" WIDE X 2'-0" DEEP
 - PARTITION - SEE WALL TYPE LEGEND
 - HANDICAP ADAPTABLE APARTMENT UNIT
 - U.F.A.S. ACCESSIBLE EFFICIENCY UNIT (TOTAL 6 UNITS)
 - U.F.A.S. COMPLIANT H.V.I. EFFICIENCY UNIT - OUTFITTED FOR PEOPLE W/ HEARING OR VISUAL IMPAIRMENTS (TOTAL 2 UNITS)

- 5'-0" DIAMETER CLEAR HANDICAP FLOOR TURNING SPACE
- 1' FLOOR TURNING SPACE
- 30" x 48" CLEAR FLOOR SPACE
- FIRE RATED SHAFT WALL
- WINDOW - SEE WINDOW SCHEDULE ON DWG. A-601
- DOOR & FRAME - SEE DOOR SCHEDULE DRAWINGS A-600
- CARBON MONOXIDE DETECTOR
- EXIT LIGHT AND SIGN - CEILING MOUNTED
- ELECTRICAL PANEL UNIT
- SUSPENDED GYPSUM BOARD

50% DESIGN DEVELOPMENT PROGRESS SET
DRAWINGS ARE SUBJECT TO CHANGE
DATE: 08-01-13

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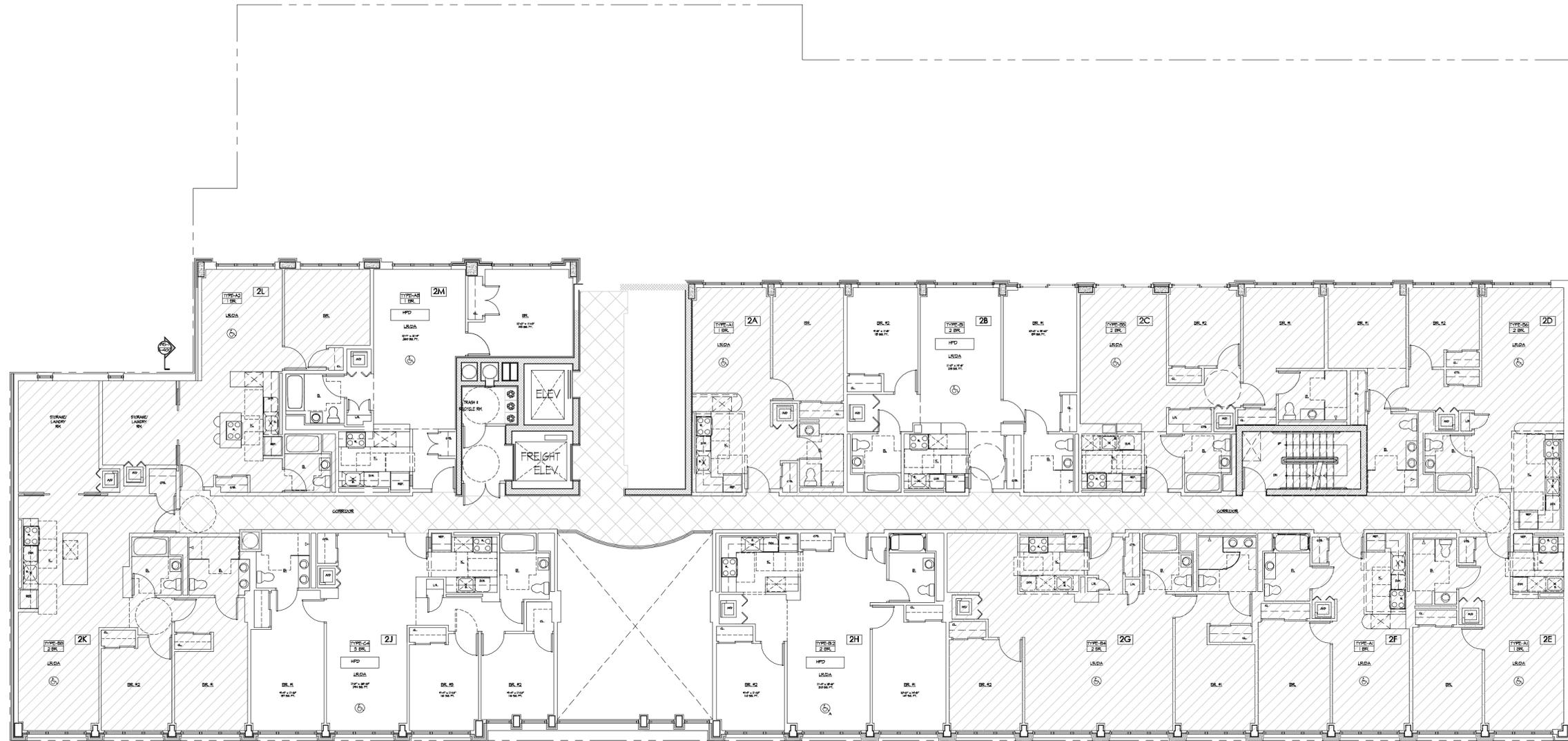
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asap Aufgang + Subotovsky
Architecture and Planning
PLLC

49 North Airmont Road, Suffern, NY 10901 tel: 845.368.0004 fax: 800.772.8304
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PROPOSED NEW MIXED USE DEVELOPMENT FOR:
DUMBO
177 FRONT ST., BROOKLYN, NEW YORK 11201
CELLAR FLOOR PLAN

DATE:	07-19-13
PROJECT NO:	1314
DRAWN BY:	MA/SCR
CHECKED BY:	PC
DRAWING NO:	A-100.00
SCALE:	AS NOTED
SHEET NO:	3 of 10
NYC DOB NUMBER:	



2ND FLOOR PLAN
SCALE: 1/8" = 1'-0"

WALL TYPE LEGEND:

- NON RATED**
- ▲ FURRING AT INTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD OVER 1/2" METAL CHANNELS @ 16" O.C.
 - ▲ TYPICAL PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
 - ▲ BATHROOM CHASE WALL PARTITION - (1) LAYER 5/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ONE SIDE OF 3/8" METAL STUDS @ 16" O.C.
 - ▲ PARTITION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3/8" METAL STUDS @ 16" O.C. (APARTMENT ELECTRICAL PANEL)
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 3/8" GALV. METAL STUDS @ 16" O.C. WITH 3/8" (R-15) BATT INSULATION UNFACED
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1/2" GALV. METAL STUDS @ 16" O.C.
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1/2" GALV. METAL STUDS @ 16" O.C. WITH 1 1/2" SEMI-RIGID INSULATION (R-15) UNFACED

1 HOUR RATED

- ▲ 1 HOUR RATED TENANT SEPARATION PARTITION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON (1) SIDE, (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD ON OTHER SIDE OF 3/8" METAL STUDS @ 16" O.C. WITH 3/8" SOUND ATTENUATION INSULATION, EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF CONCRETE DECK & SEAL TIGHT TO UNDERSIDE OF CONCRETE/METAL DECK AND/OR ROOF DECK W/ CONT. FIRESTOP SEALANT & FIRESAFING INSULATION (6A FILE #WP-1052) (STC 50-54)
- ▲ 2 HOUR RATED
- ▲ 2 HOUR RATED EXTERIOR PARTITION - (2) LAYERS OF 3/4" TYPE "X" GYPSUM BOARD, (INSIDE) 5/8" EXP EXTERIOR GYPSUM BOARD SHEATHING (OUTSIDE) OVER 3/8" 1 GA 18 GALV. METAL STUDS @ 16" O.C. WITH 3/8" BATT INSULATION (UNFACED) (R-15) (UL-424)
- ▲ 2 HOUR RATED INTERIOR PARTITION - (2) LAYERS 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE 3/8" METAL STUDS @ 16" O.C. WITH 3/8" SOUND ATTENUATION INSULATION, EXTEND GYPSUM BOARD & STUDS UP TO UNDERSIDE OF FLOOR/METAL DECK OR ROOF DECK, SEAL TIGHT TO DECK W/ CONT. FIRESTOP SEALANT & FIRESAFING. (6A FILE #WP-1522 STC 55-59).
- ▲ 2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE BLOCK COURSES, SEAL TOP OF CONCRETE/METAL BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE/METAL DECK OR DECK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXIST. BETWEEN TOP OF WALL AND BOTTOM OF DECK (UL #906)

- 2 HOUR RATED MECHANICAL SHAFT WALL - (2) LAYERS OF 1/2" TYPE "X" GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL C-H STUDS @ 24" O.C. WITH (1) LAYER OF 1" TYPE "X" GYPSUM LINER PANEL ON SHAFT SIDE W/ 1" MINERAL FIBER INSULATION IN CAVITY. SEAL TOP OF WALL TIGHT TO UNDERSIDE OF CONCRETE DECK W/ CONT. FIRESTOP SEALANT. 6A FILE #4015 (STC-45-49)**
- 3 HOUR RATED**
- ▲ 3 HOUR RATED WALL - (1) LAYER 1/2" TYPE "X" GYPSUM BOARD OVER 3/4" METAL HAT CHANNELS @ 24" O.C. OVER 2 HR RATED CONCRETE BLOCK WALL WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE COURSES. SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE/METAL FLOOR DECK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF CONCRETE/METAL DECK (UL #914) (PROVIDE STC RATINGS OF 50-54 COMPACTOR CHUTE FOR SHAFT ADJACENT TO DWELLING UNITS)

GENERAL NOTES:

1. FOR KITCHEN AND TOILET ELEVATIONS SEE DRAWING A-XXX.
2. G.C. SHALL COORDINATE SIZE & LOCATION OF ALL HVAC OPENINGS IN CONG/METAL DECK WITH MECHANICAL DRAWINGS.
3. CONTRACTOR SHALL COORDINATE SIZE AND LOCATION OF ALL MASONRY OPENINGS AT ELEVATOR ENTRANCES WITH ELEVATOR VENDOR.
4. ALL ENLARGED PLAN DIMENSIONS ARE TAKEN FINISH TO FINISH (U.O.N.).

LEGEND:

- CONCRETE FOUNDATION WALL
- CONCRETE BLOCK WALL - 2HR FIRE RATED
- GYPSUM BOARD PARTITION - SEE PLAN FOR SIZE
- MASONRY VENEER
- REMOVABLE KITCHEN BASE CABINET - 2'-0" WIDE X 2'-0" DEEP
- PARTITION - SEE WALL TYPE LEGEND
- HANDICAP ADAPTABLE APARTMENT UNIT
- U.F.A.S. ACCESSIBLE EFFICIENCY UNIT (TOTAL 6 UNITS)
- U.F.A.S. COMPLIANT H.V.I. EFFICIENCY UNIT - OUTFITTED FOR PEOPLE W/ HEARING OR VISUAL IMPAIRMENTS (TOTAL 2 UNITS)
- 5'-0" DIAMETER CLEAR HANDICAP FLOOR TURNING SPACE
- 1' FLOOR TURNING SPACE
- 30" x 48" CLEAR FLOOR SPACE
- FIRE RATED SHAFT WALL
- WINDOW - SEE WINDOW SCHEDULE ON DWG. A-601
- DOOR & FRAME - SEE DOOR SCHEDULE DRAWINGS A-600
- CARBON MONOXIDE DETECTOR
- EXIT LIGHT AND SIGN - CEILING MOUNTED
- ELECTRICAL PANEL UNIT
- SUSPENDED GYPSUM BOARD

50% DESIGN DEVELOPMENT PROGRESS SET
DRAWINGS ARE SUBJECT TO CHANGE
DATE: 08-01-13

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DATE	REVISIONS
07-19-13	ISSUED TO HPD FOR REVIEW AND COMMENT

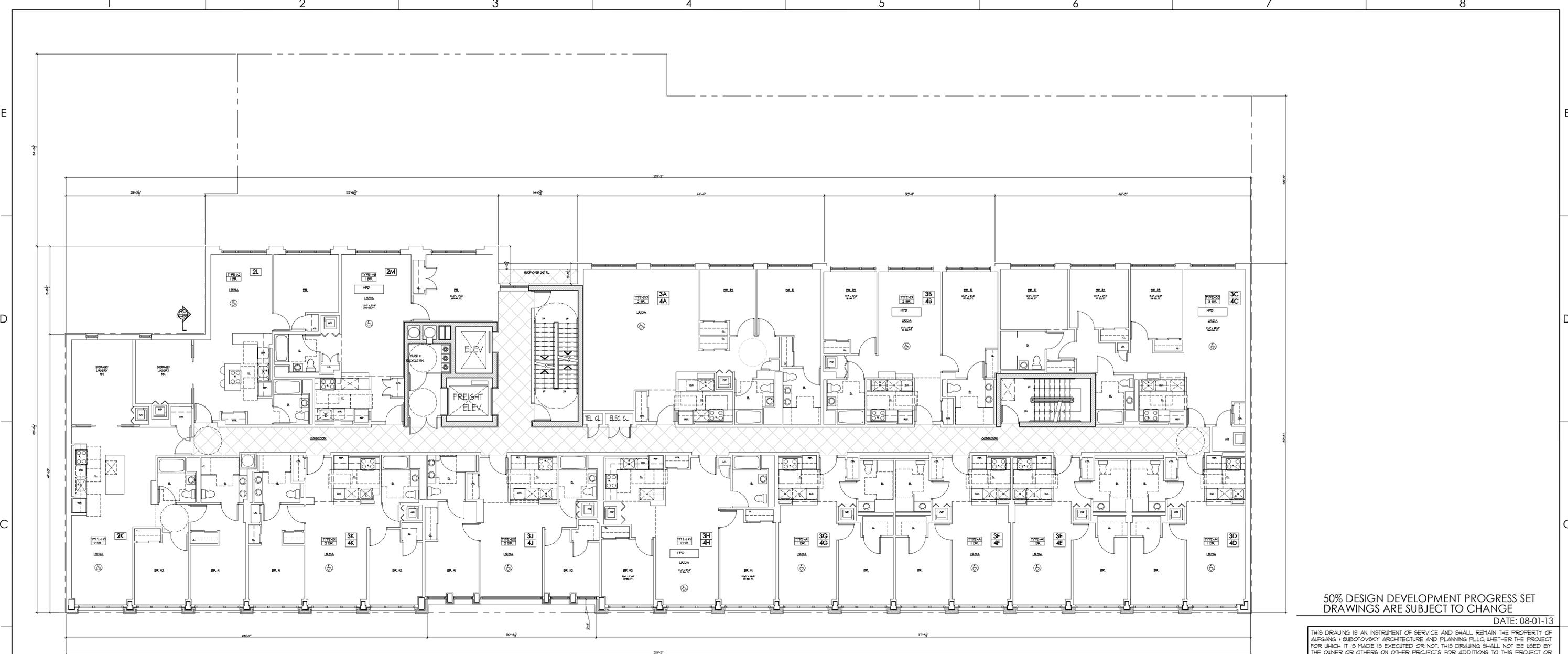
asap Aufgang + Subotovsky
Architecture and Planning
PLLC

49 North Airmont Road, Suffern, NY 10901 tel: 845.368.0004 fax: 800.772.8304
www.asaparchitecture.com

PROPOSED NEW MIXED USE DEVELOPMENT FOR:
DUMBO
177 FRONT ST., BROOKLYN, NEW YORK 11201

2ND FLOOR PLAN

DATE:	07-19-13
PROJECT NO:	1314
DRAWN BY:	MA/SCR
CHECKED BY:	PC
DRAWING NO:	A-102.00
SCALE:	AS NOTED
SHEET NO:	5 of 13
NYC DOB NUMBER:	



50% DESIGN DEVELOPMENT PROGRESS SET
DRAWINGS ARE SUBJECT TO CHANGE
DATE: 08-01-13

3RD AND 4TH FLOOR PLAN
SCALE: 1/8" = 1'-0"

WALL TYPE LEGEND:

- NON RATED**
- ▲ FURRING AT INTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD OVER 1/2" METAL CHANNELS @ 16" O.C.
 - ▲ TYPICAL PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
 - ▲ BATHROOM CHASE WALL PARTITION - (1) LAYER 5/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ONE SIDE OF 3 3/8" METAL STUDS @ 16" O.C.
 - ▲ PARTITION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3 3/8" METAL STUDS @ 16" O.C. @ APARTMENT ELECTRICAL PANEL
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 3 3/8" GALV. METAL STUDS @ 16" O.C. WITH 3 1/2" (R-15) BATT INSULATION UNFACED
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C.
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C. WITH 1 1/2" SEMI-RIGID INSULATION (R-15) UNFACED

- 1 HOUR RATED**
- ▲ 1 HOUR RATED TENANT SEPARATION PARTITION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON (1) SIDE, (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD ON OTHER SIDE OF 3 3/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF CONCRETE DECK & SEAL TIGHT TO UNDERSIDE OF CONCRETE/METAL DECK OR ROOF DECK. (6A FILE #WP-1052) (STC 50-54)
 - ▲ 2 HOUR RATED EXTERIOR PARTITION - (2) LAYERS OF 3/4" TYPE "X" GYPSUM BOARD, (INSIDE) 5/8" EXP EXTERIOR GYPSUM BOARD SHEATHING (OUTSIDE) OVER 3 3/8" 1 GA 18 GALV. METAL STUDS @ 16" O.C. WITH 3 1/2" BATT INSULATION (UNFACED) (R-15) (UL-424)
 - ▲ 2 HOUR RATED INTERIOR PARTITION - (2) LAYERS 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE 3 3/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND GYPSUM BOARD & STUDS UP TO UNDERSIDE OF FLOOR/METAL DECK OR ROOF DECK. SEAL TIGHT TO DECK. (6A FILE #WP-1522 STC 55-59).
 - ▲ 2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE BLOCK COURSES. SEAL TOP OF CONCRETE/METAL BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE/METAL DECK OR DECK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF DECK (UL #906)

- 2 HOUR RATED MECHANICAL SHAFT WALL - (2) LAYERS OF 1/2" TYPE "X" GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL C-H STUDS @ 24" O.C. WITH (1) LAYER OF 1" TYPE "X" GYPSUM LINER PANEL ON SHAFT SIDE. W/ 1" MINERAL FIBER INSULATION IN CAVITY. SEAL TOP OF WALL TIGHT TO UNDERSIDE OF CONCRETE DECK. (6A FILE #4015 (STC-45-49))**
- 3 HOUR RATED**
- ▲ 3 HOUR RATED WALL - (1) LAYER 1/2" TYPE "X" GYPSUM BOARD OVER 3/4" METAL HAT CHANNELS @ 24" O.C. OVER 2 HR RATED CONCRETE BLOCK WALL WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE COURSES. SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE/METAL FLOOR DECK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF CONCRETE/METAL DECK (UL #914) (PROVIDE STC RATINGS OF 50-54 COMPACTOR CHUTE FOR SHAFT ADJACENT TO DWELLING UNITS)
- GENERAL NOTES:**
1. FOR KITCHEN AND TOILET ELEVATIONS SEE DRAWING A-XXX.
 2. G.C. SHALL COORDINATE SIZE & LOCATION OF ALL HVAC OPENINGS IN CONG/METAL DECK WITH MECHANICAL DRAWINGS.
 3. CONTRACTOR SHALL COORDINATE SIZE AND LOCATION OF ALL MASONRY OPENINGS AT ELEVATOR ENTRANCES WITH ELEVATOR VENDOR.
 4. ALL ENLARGED PLAN DIMENSIONS ARE TAKEN FINISH TO FINISH (U.O.N.).

- LEGEND:**
- CONCRETE FOUNDATION WALL
 - CONCRETE BLOCK WALL - 2HR FIRE RATED
 - GYPSUM BOARD PARTITION - SEE PLAN FOR SIZE
 - MASONRY VENEER
 - REMOVABLE KITCHEN BASE CABINET - 2'-0" WIDE X 2'-0" DEEP
 - PARTITION - SEE WALL TYPE LEGEND
 - HANDICAP ADAPTABLE APARTMENT UNIT
 - U.F.A.S. ACCESSIBLE EFFICIENCY UNIT (TOTAL 6 UNITS)
 - U.F.A.S. COMPLIANT H.V.I. EFFICIENCY UNIT - OUTFITTED FOR PEOPLE W/ HEARING OR VISUAL IMPAIRMENTS (TOTAL 2 UNITS)

- 5'-0" DIAMETER CLEAR HANDICAP FLOOR TURNING SPACE
- 1' FLOOR TURNING SPACE
- 30" x 48" CLEAR FLOOR SPACE
- FIRE RATED SHAFT WALL
- WINDOW - SEE WINDOW SCHEDULE ON DWG. A-601
- DOOR & FRAME - SEE DOOR SCHEDULE DRAWINGS A-600
- CARBON MONOXIDE DETECTOR
- EXIT LIGHT AND SIGN - CEILING MOUNTED
- ELECTRICAL PANEL UNIT
- SUSPENDED GYPSUM BOARD

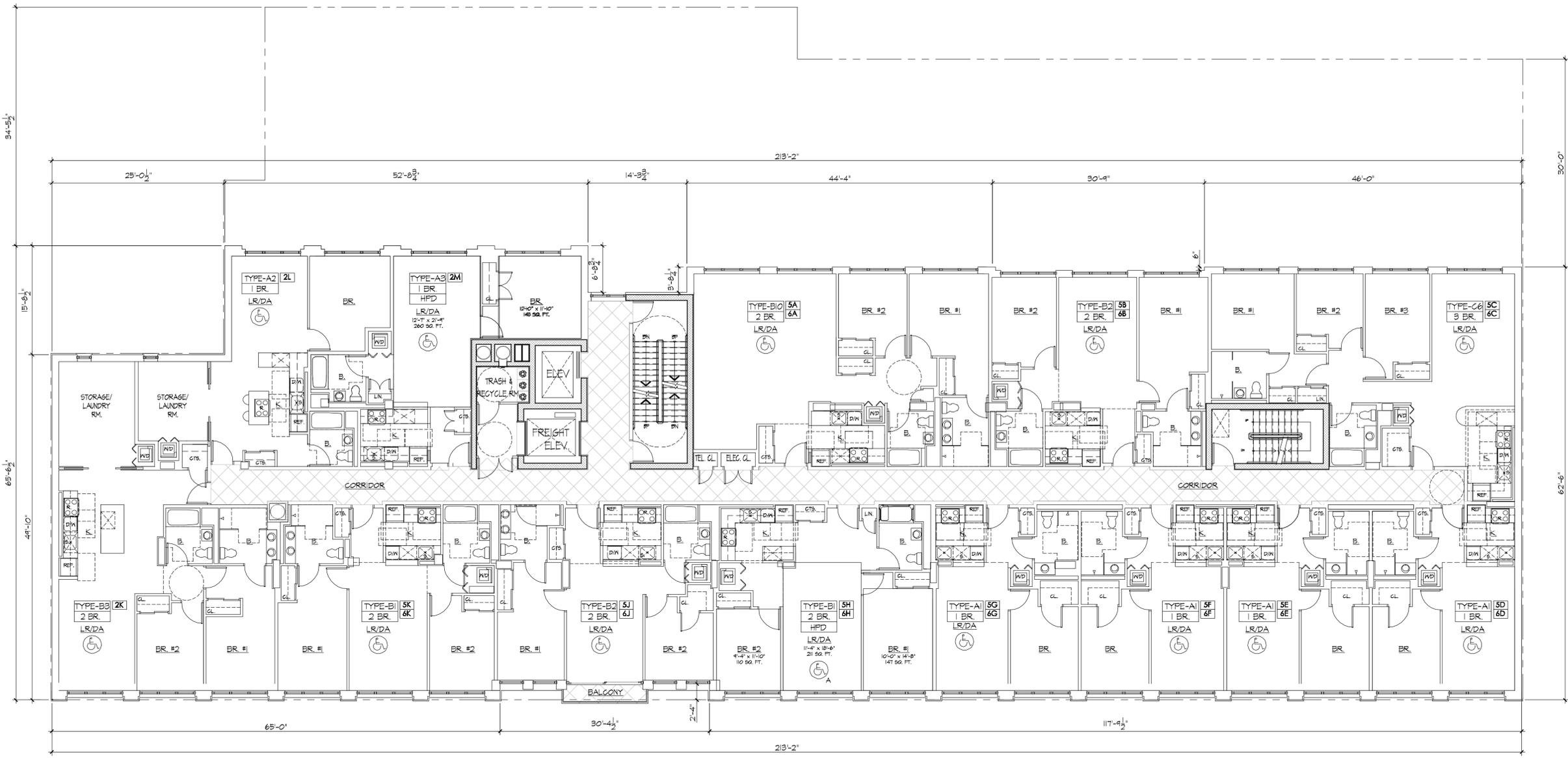
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PROPOSED NEW MIXED USE DEVELOPMENT FOR:
DUMBO
177 FRONT ST., BROOKLYN, NEW YORK 11201
3RD & 4TH FLOOR PLAN

DATE:	07-19-13
PROJECT NO:	1314
DRAWN BY:	MA/SCR
CHECKED BY:	PC
DRAWING NO:	A-103.00
SCALE:	AS NOTED
SHEET NO:	6 of 13
NYC DOB NUMBER:	



5TH & 6TH FLOOR PLAN

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



WALL TYPE LEGEND:

- NON RATED**
- ▲ FURRING AT INTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD OVER 1/2" METAL CHANNELS @ 16" O.C.
 - ▲ TYPICAL PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
 - ▲ BATHROOM CHASE WALL PARTITION - (1) LAYER 5/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ONE SIDE OF 3 3/8" METAL STUDS @ 16" O.C.
 - ▲ PARTITION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3 3/8" METAL STUDS @ 16" O.C. (APARTMENT ELECTRICAL PANEL)
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 3 3/8" GALV. METAL STUDS @ 16" O.C. WITH 3 1/2" (R-15) BATT INSULATION UNFACED
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C.
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C. WITH 1 1/2" SEMI-RIGID INSULATION (R15) UNFACED

- 1 HOUR RATED**
- ▲ 1 HOUR RATED TENANT SEPARATION PARTITION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON (1) SIDE, (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD ON OTHER SIDE OF 3 3/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF CONCRETE DECK & SEAL TIGHT TO UNDERSIDE OF CONCRETE/METAL DECK OR ROOF DECK W/ CONT. FIRESTOP SEALANT & FIRESAFING INSULATION (GA FILE #WP-1052) (STC 50-54)
 - ▲ 2 HOUR RATED
 - ▲ 2 HOUR RATED EXTERIOR PARTITION - (2) LAYERS OF 3/4" TYPE "X" GYPSUM BOARD, (INSIDE) 5/8" EXP EXTERIOR GYPSUM BOARD SHEATHING (OUTSIDE) OVER 3 3/8" 1 GA 18 GALV. METAL STUDS @ 16" O.C. WITH 3 1/2" BATT INSULATION (UNFACED) (R-15) (UL-424)
 - ▲ 2 HOUR RATED INTERIOR PARTITION - (2) LAYERS 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE 3 3/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND GYPSUM BOARD & STUDS UP TO UNDERSIDE OF FLOOR/METAL DECK OR ROOF DECK, SEAL TIGHT TO DECK W/ CONT. FIRESTOP SEALANT & FIRESAFING. (GA FILE #WP-1522 STC 55-59).
 - ▲ 2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE BLOCK COURSES. SEAL TOP OF CONCRETE/METAL BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE/METAL DECK OR DECK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXIST. BETWEEN TOP OF WALL AND BOTTOM OF DECK (UL #906)

- 2 HOUR RATED MECHANICAL SHAFT WALL - (2) LAYERS OF 1/2" TYPE "X" GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL C-H STUDS @ 24" O.C. WITH (1) LAYER OF 1" TYPE "X" GYPSUM LINER PANEL ON SHAFT SIDE W/ 1" MINERAL FIBER INSULATION IN CAVITY. SEAL TOP OF WALL TIGHT TO UNDERSIDE OF CONCRETE DECK W/ CONT. FIRESTOP SEALANT. GA FILE #4015 (STC-45-49)**
- 3 HOUR RATED**
- ▲ 3 HOUR RATED WALL - (1) LAYER 1/2" TYPE "X" GYPSUM BOARD OVER 3/4" METAL HAT CHANNELS @ 24" O.C. OVER 2 HR RATED CONCRETE BLOCK WALL WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE COURSES. SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE/METAL FLOOR DECK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF CONCRETE/METAL DECK (UL #114) (PROVIDE STC RATINGS OF 50-54 COMPACTOR CHUTE FOR SHAFT ADJACENT TO DWELLING UNITS)
- GENERAL NOTES:**
1. FOR KITCHEN AND TOILET ELEVATIONS SEE DRAWING A-XXX.
 2. G.C. SHALL COORDINATE SIZE & LOCATION OF ALL HVAC OPENINGS IN CONCRETE/METAL DECK WITH MECHANICAL DRAWINGS.
 3. CONTRACTOR SHALL COORDINATE SIZE AND LOCATION OF ALL MASONRY OPENINGS AT ELEVATOR ENTRANCES WITH ELEVATOR VENDOR.
 4. ALL ENLARGED PLAN DIMENSIONS ARE TAKEN FINISH TO FINISH (U.O.N.).

- LEGEND:**
- CONCRETE FOUNDATION WALL
 - CONCRETE BLOCK WALL - 2HR FIRE RATED
 - GYPSUM BOARD PARTITION - SEE PLAN FOR SIZE
 - MASONRY VENEER
 - REMOVABLE KITCHEN BASE CABINET - 2'-0" WIDE X 2'-0" DEEP
 - PARTITION - SEE WALL TYPE LEGEND
 - HANDICAP ADAPTABLE APARTMENT UNIT
 - U.F.A.S. ACCESSIBLE EFFICIENCY UNIT (TOTAL 6 UNITS)
 - U.F.A.S. COMPLIANT H.V.I. EFFICIENCY UNIT - OUTFITTED FOR PEOPLE W/ HEARING OR VISUAL IMPAIRMENTS (TOTAL 2 UNITS)

- 5'-0" DIAMETER CLEAR HANDICAP FLOOR TURNING SPACE
- 1' FLOOR TURNING SPACE
- 30" x 48" CLEAR FLOOR SPACE
- FIRE RATED SHAFT WALL
- WINDOW - SEE WINDOW SCHEDULE ON DWG. A-601
- DOOR & FRAME - SEE DOOR SCHEDULE DRAWINGS A-600
- CARBON MONOXIDE DETECTOR
- EXIT LIGHT AND SIGN - CEILING MOUNTED
- ELECTRICAL PANEL UNIT
- SUSPENDED GYPSUM BOARD

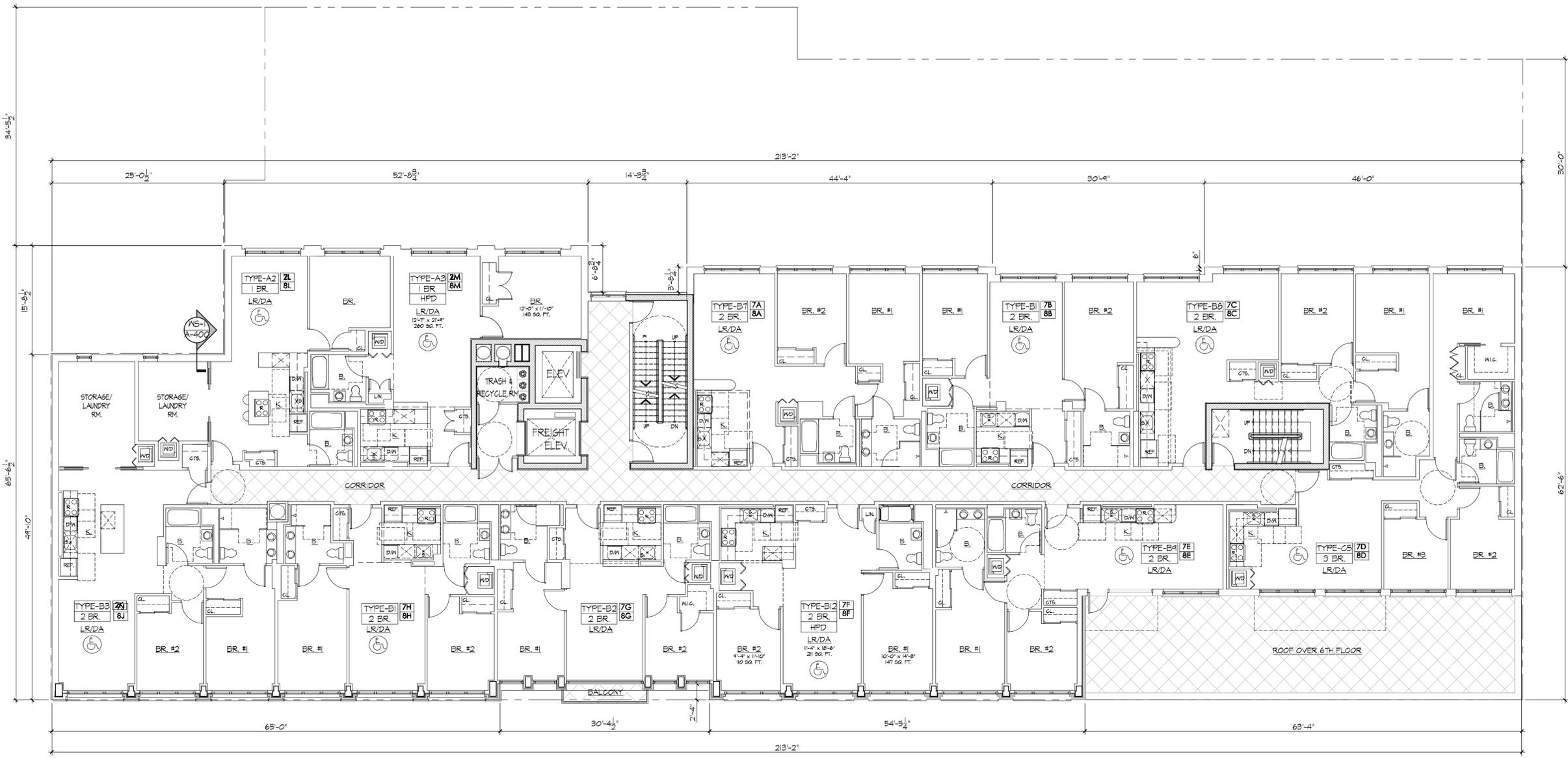
50% DESIGN DEVELOPMENT PROGRESS SET
DRAWINGS ARE SUBJECT TO CHANGE
DATE: 08-01-13

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Aufgang + Subotovsky Architecture and Planning PLLC	
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PROPOSED NEW MIXED USE DEVELOPMENT FOR:
DUMBO
177 FRONT ST., BROOKLYN, NEW YORK 11201
5TH & 6TH FLOOR PLAN

DATE:	07-19-13
PROJECT NO:	1314
DRAWN BY:	MA/SCR
CHECKED BY:	PC
DRAWING NO:	A-104.00
SCALE:	AS NOTED
SHEET NO:	7 of 13
NYC DOB NUMBER:	



7TH & 8TH FLOOR PLAN
SCALE: 1/8" = 1'-0"

WALL TYPE LEGEND:

- NON RATED**
- ▲ FURRING AT INTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD OVER 1/2" METAL CHANNELS @ 16" O.C.
 - ▲ TYPICAL PARTITION - (1) LAYER 3/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
 - ▲ BATHROOM CHASE WALL PARTITION - (1) LAYER 3/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ONE SIDE OF 3 3/8" METAL STUDS @ 16" O.C.
 - ▲ PARTITION - (1) LAYER OF 3/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3 3/8" METAL STUDS @ 16" O.C. (APARTMENT ELECTRICAL PANEL)
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 3/8" TYPE "X" GYPSUM BOARD ON 3 3/8" GALV. METAL STUDS @ 16" O.C. WITH 3 1/2" (R-15) BATT INSULATION UNFACED
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 3/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C.
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 3/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C. WITH 1 1/2" SEMI-RIGID INSULATION (R-15) UNFACED

- 1 HOUR RATED**
- ▲ 1 HOUR RATED TENANT SEPARATION PARTITION - (1) LAYER OF 3/8" TYPE "X" GYPSUM BOARD ON (1) SIDE, (2) LAYERS OF 3/8" TYPE "X" GYPSUM BOARD ON OTHER SIDE OF 3 3/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF CONCRETE DECK & SEAL TIGHT TO UNDERSIDE OF CONCRETE/METAL DECK AND/OR ROOF DECK W/ CONT. FIRESTOP SEALANT & FIRESAFING INSULATION (GA FILE #WP-1052) (STC 50-54)
 - ▲ 2 HOUR RATED
 - ▲ 2 HOUR RATED EXTERIOR PARTITION - (2) LAYERS OF 3/4" TYPE "X" GYPSUM BOARD, (INSIDE) 3/8" EXP EXTERIOR GYPSUM BOARD SHEATHING (OUTSIDE) OVER 3 3/8" 1 GA 18 GALV. METAL STUDS @ 16" O.C. WITH 3 1/2" BATT INSULATION (UNFACED) (R-15) (UL-424)
 - ▲ 2 HOUR RATED INTERIOR PARTITION - (2) LAYERS 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE 3 3/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND GYPSUM BOARD & STUDS UP TO UNDERSIDE OF FLOOR/METAL DECK OR ROOF DECK, SEAL TIGHT TO DECK W/ CONT. FIRESTOP SEALANT & FIRESAFING. (GA FILE #WP-1522 STC 55-59).
 - ▲ 2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE BLOCK COURSES. SEAL TOP OF CONCRETE/METAL BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE/METAL DECK OR DECK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXIST. BETWEEN TOP OF WALL AND BOTTOM OF DECK (UL #906)

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- 3 HOUR RATED**
- ▲ 3 HOUR RATED WALL - (1) LAYER 1/2" TYPE "X" GYPSUM BOARD OVER 3/4" METAL HAT CHANNELS @ 24" O.C. OVER 2 HR RATED CONCRETE BLOCK WALL WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE COURSES. SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE/METAL FLOOR DECK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF CONCRETE/METAL DECK (UL #1414) (PROVIDE STC RATINGS OF 50-54 COMPACTOR CHUTE FOR SHAFT ADJACENT TO DWELLING UNITS)
- GENERAL NOTES:**
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 - ALL ENLARGED PLAN DIMENSIONS ARE TAKEN FINISH TO FINISH (U.O.N.).

- LEGEND:**
- CONCRETE FOUNDATION WALL
 - CONCRETE BLOCK WALL - 2HR FIRE RATED
 - GYPSUM BOARD PARTITION - SEE PLAN FOR SIZE
 - MASONRY VENEER
 - REMOVABLE KITCHEN BASE CABINET - 2'-0" WIDE X 2'-0" DEEP
 - PARTITION - SEE WALL TYPE LEGEND
 - HANDICAP ADAPTABLE APARTMENT UNIT
 - U.F.A.S. ACCESSIBLE EFFICIENCY UNIT (TOTAL 6 UNITS)
 - U.F.A.S. COMPLIANT H.V.I. EFFICIENCY UNIT - OUTFITTED FOR PEOPLE W/ HEARING OR VISUAL IMPAIRMENTS (TOTAL 2 UNITS)

- 5'-0" DIAMETER CLEAR HANDICAP FLOOR TURNING SPACE
- 1" FLOOR TURNING SPACE
- 30" x 48" CLEAR FLOOR SPACE
- FIRE RATED SHAFT WALL
- WINDOW - SEE WINDOW SCHEDULE ON DWG. A-601
- DOOR & FRAME - SEE DOOR SCHEDULE DRAWINGS A-600
- CARBON MONOXIDE DETECTOR
- EXIT LIGHT AND SIGN - CEILING MOUNTED
- ELECTRICAL PANEL UNIT
- SUSPENDED GYPSUM BOARD

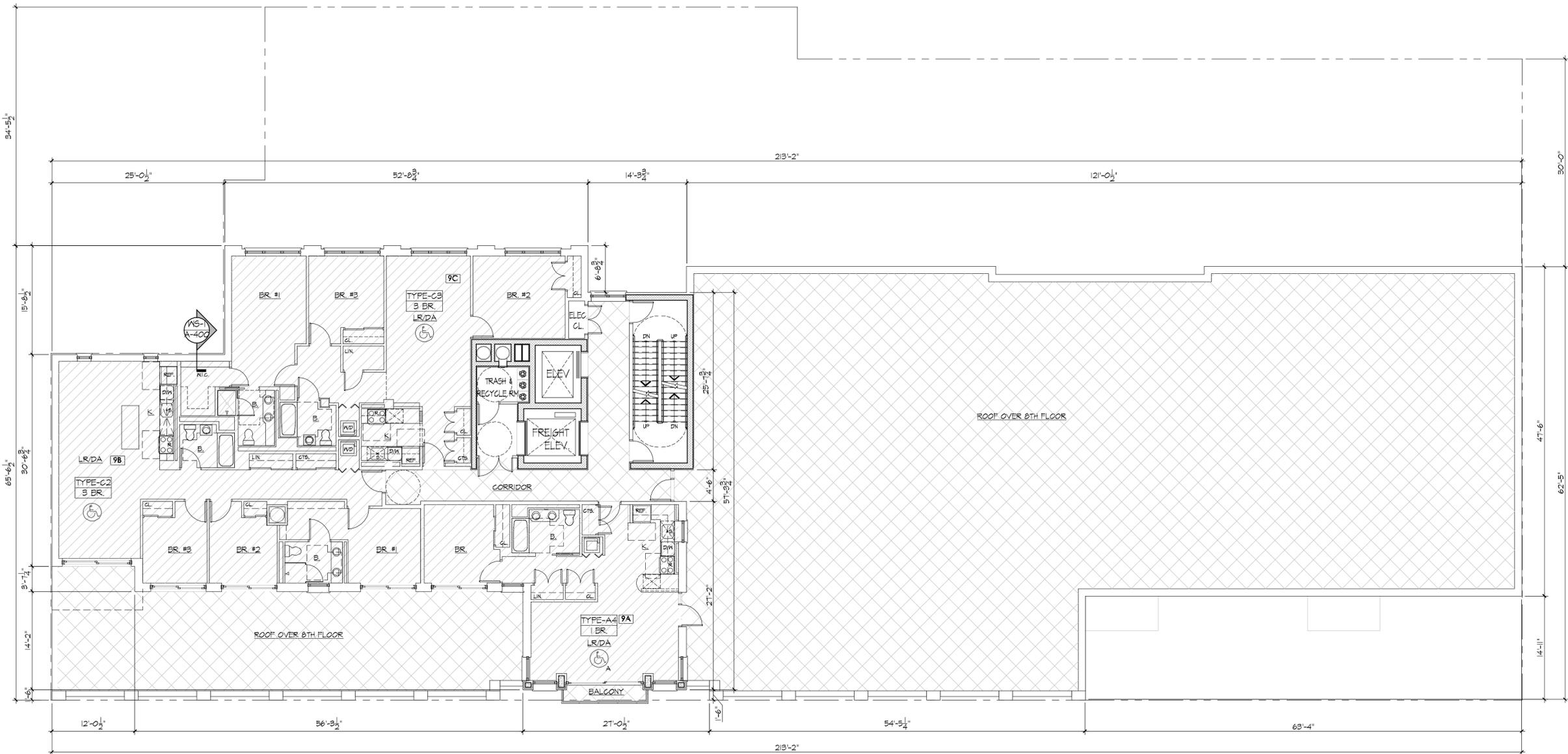
50% DESIGN DEVELOPMENT PROGRESS SET
DRAWINGS ARE SUBJECT TO CHANGE
DATE: 08-01-13

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07-19-13	ISSUED TO HPD FOR REVIEW AND COMMENT
DATE	REVISIONS
Aufgang + Subotovsky Architecture and Planning PLLC	
49 North Airmont Road, Suffern, NY 10901 tel: 845.368.0004 fax: 800.772.8304 www.asaparchitecture.com	

PROPOSED NEW MIXED USE DEVELOPMENT FOR:
DUMBO
177 FRONT ST., BROOKLYN, NEW YORK 11201
7TH & 8TH FLOOR PLAN

DATE:	07-19-13
PROJECT NO:	1314
DRAWN BY:	MA/SCR
CHECKED BY:	PC
DRAWING NO:	A-105.00
SCALE:	AS NOTED
SHEET NO:	8 of 13
NYC DOB NUMBER:	



9TH FLOOR PLAN
SCALE: 1/8" = 1'-0"



WALL TYPE LEGEND:

- NON RATED**
- ▲ FURRING AT INTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD OVER 1/2" METAL CHANNELS @ 16" O.C.
 - ▲ TYPICAL PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
 - ▲ BATHROOM CHASE WALL PARTITION - (1) LAYER 5/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ONE SIDE OF 3 3/8" METAL STUDS @ 16" O.C.
 - ▲ PARTITION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3 3/8" METAL STUDS @ 16" O.C. (APARTMENT ELECTRICAL PANEL)
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 3 3/8" GALV. METAL STUDS @ 16" O.C. WITH 3 1/2" (R-15) BATT INSULATION UNFACED
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C.
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C. WITH 1 1/2" SEMI-RIGID INSULATION (R-15) UNFACED

- 1 HOUR RATED**
- ▲ 1 HOUR RATED TENANT SEPARATION PARTITION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON (1) SIDE, (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD ON OTHER SIDE OF 3 3/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF CONCRETE DECK & SEAL TIGHT TO UNDERSIDE OF CONCRETE/METAL DECK AND/OR ROOF DECK W/ CONT. FIRESTOP SEALANT & FIRESAFING INSULATION (6A FILE #WP-1052) (STC 50-54)
 - ▲ 2 HOUR RATED
 - ▲ 2 HOUR RATED EXTERIOR PARTITION - (2) LAYERS OF 3/4" TYPE "X" GYPSUM BOARD, (INSIDE) 5/8" EXP EXTERIOR GYPSUM BOARD SHEATHING (OUTSIDE) OVER 3 3/8" 1 GA 18 GALV. METAL STUDS @ 16" O.C. WITH 3 1/2" BATT INSULATION (UNFACED) (R-15) (UL-424)
 - ▲ 2 HOUR RATED INTERIOR PARTITION - (2) LAYERS 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE 3 3/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND GYPSUM BOARD & STUDS UP TO UNDERSIDE OF FLOOR METAL DECK OR ROOF DECK, SEAL TIGHT TO DECK W/ CONT. FIRESTOP SEALANT & FIRESAFING. (6A FILE #WP-1522 STC 55-59).
 - ▲ 2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE BLOCK COURSES, SEAL TOP OF CONCRETE/METAL BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE/METAL DECK OR DECK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXIST. BETWEEN TOP OF WALL AND BOTTOM OF DECK (UL #906)

- 2 HOUR RATED MECHANICAL SHAFT WALL - (2) LAYERS OF 1/2" TYPE "X" GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL C-H STUDS @ 24" O.C. WITH (1) LAYER OF 1" TYPE "X" GYPSUM LINER PANEL ON SHAFT SIDE W/ 1" MINERAL FIBER INSULATION IN CAVITY. SEAL TOP OF WALL TIGHT TO UNDERSIDE OF CONCRETE DECK W/ CONT. FIRESTOP SEALANT. 6A FILE #4015 (STC-45-49)**
- 3 HOUR RATED**
- ▲ 3 HOUR RATED WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD OVER 3/4" METAL HAT CHANNELS @ 24" O.C. OVER 2 HR RATED CONCRETE BLOCK WALL WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE COURSES. SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE/METAL FLOOR DECK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF CONCRETE/METAL DECK (UL #1414) (PROVIDE STC RATINGS OF 50-54 COMPACTOR CHUTE FOR SHAFT ADJACENT TO DWELLING UNITS)
- GENERAL NOTES:**
1. FOR KITCHEN AND TOILET ELEVATIONS SEE DRAWING A-XXX.
 2. G.C. SHALL COORDINATE SIZE & LOCATION OF ALL HVAC OPENINGS IN CONC/METAL DECK WITH MECHANICAL DRAWINGS.
 3. CONTRACTOR SHALL COORDINATE SIZE AND LOCATION OF ALL MASONRY OPENINGS AT ELEVATOR ENTRANCES WITH ELEVATOR VENDOR.
 4. ALL ENLARGED PLAN DIMENSIONS ARE TAKEN FINISH TO FINISH (U.O.N.).

- LEGEND:**
- CONCRETE FOUNDATION WALL
 - CONCRETE BLOCK WALL - 2HR FIRE RATED
 - GYPSUM BOARD PARTITION - SEE PLAN FOR SIZE
 - MASONRY VENEER
 - REMOVABLE KITCHEN BASE CABINET - 2'-6" WIDE x 2'-0" DEEP
 - PARTITION - SEE WALL TYPE LEGEND
 - HANDICAP ADAPTABLE APARTMENT UNIT
 - U.F.A.S. ACCESSIBLE EFFICIENCY UNIT (TOTAL 6 UNITS)
 - U.F.A.S. COMPLIANT H.V.I. EFFICIENCY UNIT - OUTFITTED FOR PEOPLE W/ HEARING OR VISUAL IMPAIRMENTS (TOTAL 2 UNITS)

- 5'-0" DIAMETER CLEAR HANDICAP FLOOR TURNING SPACE
- 1' FLOOR TURNING SPACE
- 30" x 48" CLEAR FLOOR SPACE
- FIRE RATED SHAFT WALL
- WINDOW - SEE WINDOW SCHEDULE ON DWG. A-601
- DOOR & FRAME - SEE DOOR SCHEDULE DRAWINGS A-600
- CARBON MONOXIDE DETECTOR
- EXIT LIGHT AND SIGN - CEILING MOUNTED
- ELECTRICAL PANEL UNIT
- SUSPENDED GYPSUM BOARD

50% DESIGN DEVELOPMENT PROGRESS SET
DRAWINGS ARE SUBJECT TO CHANGE
DATE: 08-01-13

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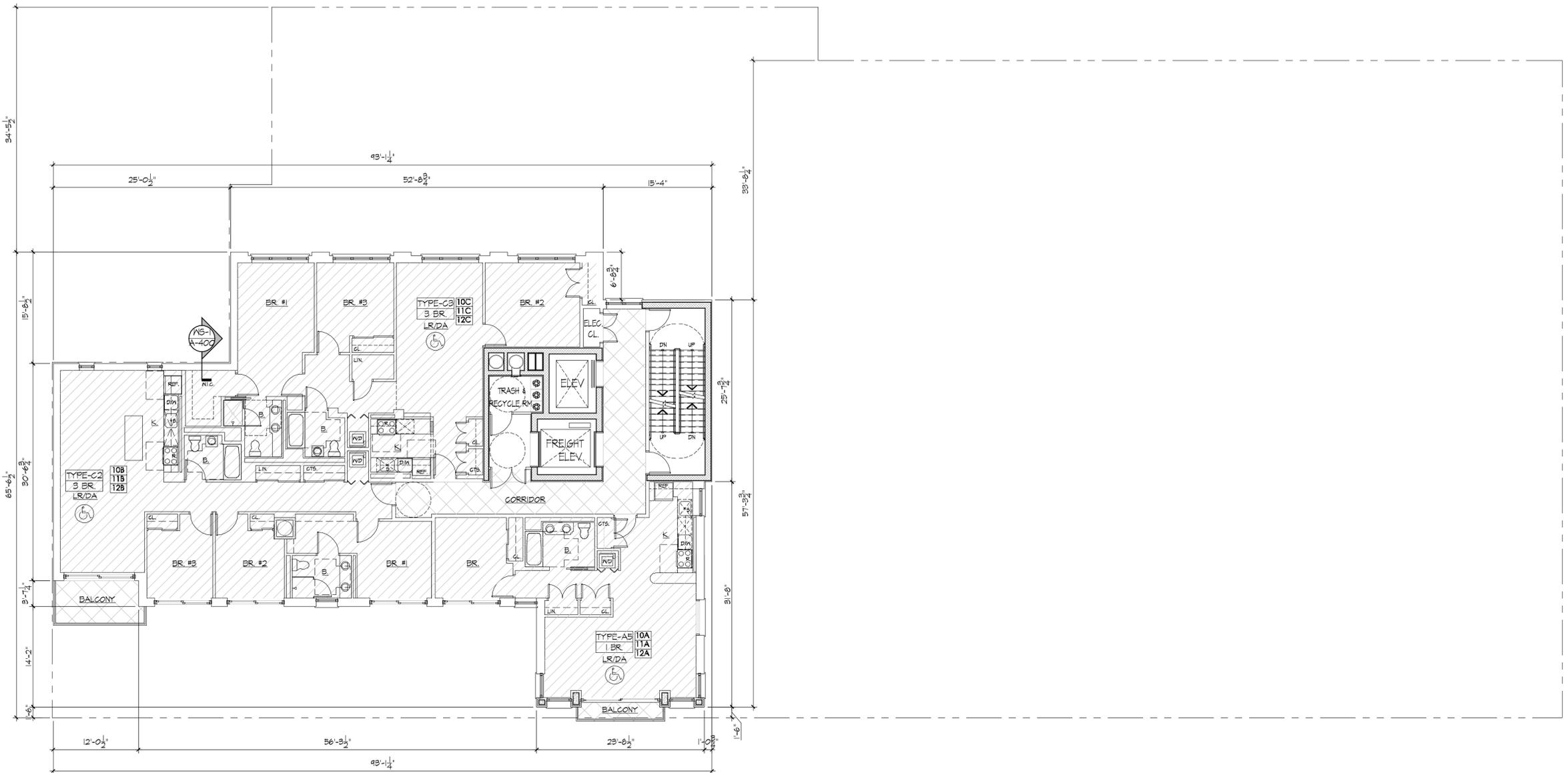
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www.asaparchitecture.com

PROPOSED NEW MIXED USE DEVELOPMENT FOR:
DUMBO
177 FRONT ST., BROOKLYN, NEW YORK 11201

9TH FLOOR PLAN

DATE:	07-19-13
PROJECT NO:	1314
DRAWN BY:	MA/SCR
CHECKED BY:	PC
DRAWING NO:	A-106.00
SCALE:	AS NOTED
SHEET NO:	9 of 13
NYC DOB NUMBER:	



10TH THRU 12TH FLOOR PLAN
 SCALE: 1/8" = 1'-0"

WALL TYPE LEGEND:

- NON RATED**
- ▲ FURRING AT INTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD OVER 1/2" METAL CHANNELS @ 16" O.C.
 - ▲ TYPICAL PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
 - ▲ BATHROOM CHASE WALL PARTITION - (1) LAYER 5/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ONE SIDE OF 3 3/8" METAL STUDS @ 16" O.C.
 - ▲ PARTITION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3 3/8" METAL STUDS @ 16" O.C. @ APARTMENT ELECTRICAL PANEL
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 3 3/8" GALV. METAL STUDS @ 16" O.C. WITH 3 1/2" (R-15) BATT INSULATION UNFACED
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C.
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C. WITH 1 1/2" SEMI-RIGID INSULATION (R-15) UNFACED

- 1 HOUR RATED**
- ▲ 1 HOUR RATED TENANT SEPARATION PARTITION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON (1) SIDE, (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD ON OTHER SIDE OF 3 3/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF CONCRETE DECK & SEAL TIGHT TO UNDERSIDE OF CONCRETE/METAL DECK AND/OR ROOF DECK W/ CONT. FIRESTOP SEALANT & FIRESAFING INSULATION (6A FILE #WP-10B2) (STC 50-54)
- 2 HOUR RATED**
- ▲ 2 HOUR RATED EXTERIOR PARTITION - (2) LAYERS OF 3/4" TYPE "X" GYPSUM BOARD, (INSIDE) 5/8" EXP EXTERIOR GYPSUM BOARD SHEATHING (OUTSIDE) OVER 3 3/8" GALV. METAL STUDS @ 16" O.C. WITH 3 1/2" BATT INSULATION (UNFACED) (R-15) (UL-424)
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 - ▲ 2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE BLOCK COURSES. SEAL TOP OF CONCRETE/METAL BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE/METAL DECK OR DECK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXIST. BETWEEN TOP OF WALL AND BOTTOM OF DECK (UL #U06)

- 2 HOUR RATED MECHANICAL SHAFT WALL - (2) LAYERS OF 1/2" TYPE "X" GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL C-H STUDS @ 24" O.C. WITH (1) LAYER OF 1" TYPE "X" GYPSUM LINER PANEL ON SHAFT SIDE W/ 1" MINERAL FIBER INSULATION IN CAVITY. SEAL TOP OF WALL TIGHT TO UNDERSIDE OF CONCRETE DECK W/ CONT. FIRESTOP SEALANT. 6A FILE #4015 (STC-45-44)**
- 3 HOUR RATED**
- ▲ 3 HOUR RATED WALL - (1) LAYER 1/2" TYPE "X" GYPSUM BOARD OVER 3/4" METAL HAT CHANNELS @ 24" O.C. OVER 2 HR RATED CONCRETE BLOCK WALL WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE COURSES. SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE/METAL FLOOR DECK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF CONCRETE/METAL DECK (UL #U14) (PROVIDE STC RATINGS OF 50-54 COMPACTOR CHUTE FOR SHAFT ADJACENT TO DWELLING UNITS)
- GENERAL NOTES:**
- FOR KITCHEN AND TOILET ELEVATIONS SEE DRAWING A-XXX.
 - G.C. SHALL COORDINATE SIZE & LOCATION OF ALL HVAC OPENINGS IN CONC/METAL DECK WITH MECHANICAL DRAWINGS.
 - CONTRACTOR SHALL COORDINATE SIZE AND LOCATION OF ALL MASONRY OPENINGS AT ELEVATOR ENTRANCES WITH ELEVATOR VENDOR.
 - ALL ENLARGED PLAN DIMENSIONS ARE TAKEN FINISH TO FINISH (U.O.N.).

- LEGEND:**
- CONCRETE FOUNDATION WALL
 - CONCRETE BLOCK WALL - 2HR FIRE RATED
 - GYPSUM BOARD PARTITION - SEE PLAN FOR SIZE
 - MASONRY VENEER
 - REMOVABLE KITCHEN BASE CABINET - 2'-0" WIDE X 2'-0" DEEP
 - PARTITION - SEE WALL TYPE LEGEND
 - HANDICAP ADAPTABLE APARTMENT UNIT
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 - U.F.A.S. COMPLIANT H.V.I. EFFICIENCY UNIT - OUTFITTED FOR PEOPLE W/ HEARING OR VISUAL IMPAIRMENTS (TOTAL 2 UNITS)

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- 1' FLOOR TURNING SPACE
- 30" x 48" CLEAR FLOOR SPACE
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- WINDOW - SEE WINDOW SCHEDULE ON DWG. A-601
- DOOR & FRAME - SEE DOOR SCHEDULE DRAWINGS A-600
- CARBON MONOXIDE DETECTOR
- EXIT LIGHT AND SIGN - CEILING MOUNTED
- ELECTRICAL PANEL UNIT
- SUSPENDED GYPSUM BOARD

50% DESIGN DEVELOPMENT PROGRESS SET
 DRAWINGS ARE SUBJECT TO CHANGE
 DATE: 08-01-13

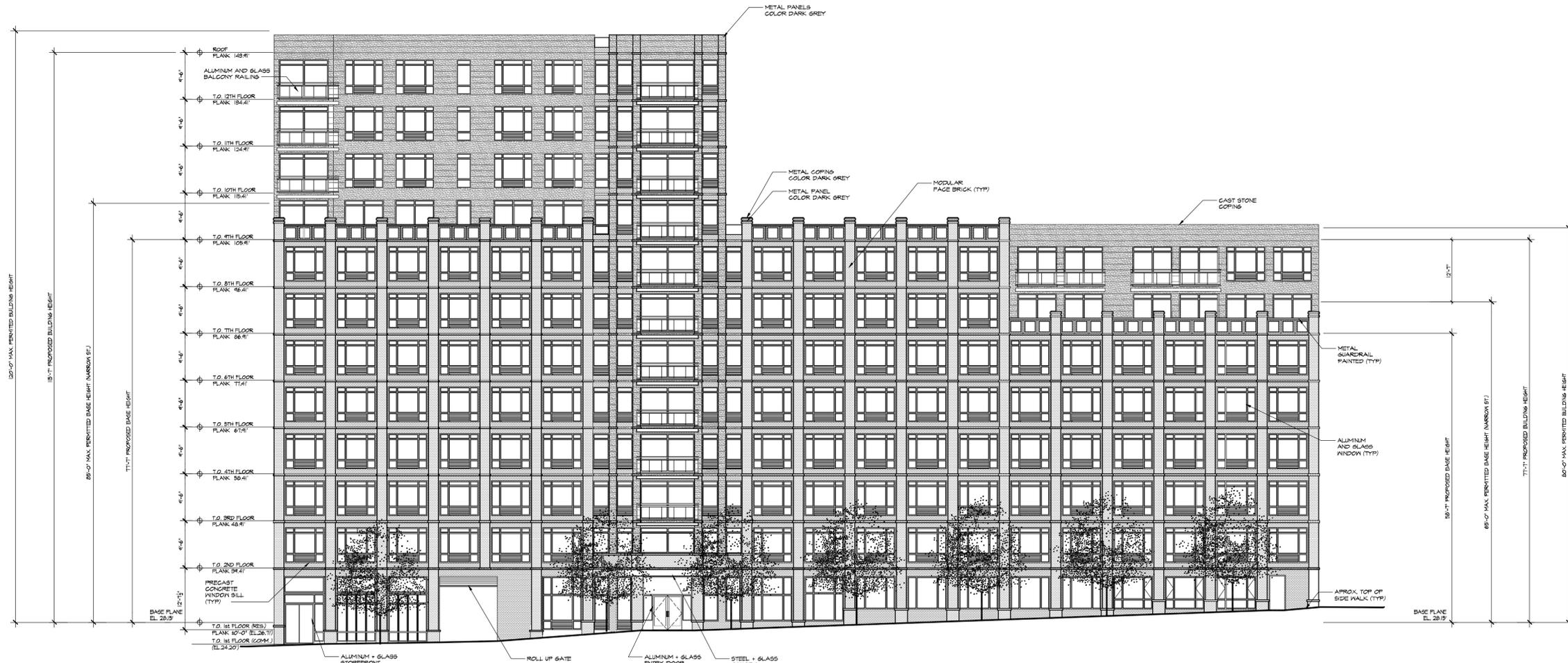
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DATE	REVISIONS
07-19-13	ISSUED TO HPD FOR REVIEW AND COMMENT

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 Architecture and Planning
 PLLC
 49 North Airmont Road, Suffern, NY 10901 tel: 845.368.0004 fax: 800.772.8304
 www.asaparchitecture.com

PROPOSED NEW MIXED USE DEVELOPMENT FOR:
DUMBO
 177 FRONT ST., BROOKLYN, NEW YORK 11201
10TH THRU 12TH FLOOR PLAN

DATE:	07-19-13
PROJECT NO:	1314
DRAWN BY:	MA/SCR
CHECKED BY:	PC
DRAWING NO:	A-107.00
SCALE:	AS NOTED
SHEET NO:	10 of 13
NYC DOB NUMBER:	



FRONT STREET ELEVATION
SCALE: 1/8" = 1'-0"

50% DESIGN DEVELOPMENT PROGRESS SET
DRAWINGS ARE SUBJECT TO CHANGE
DATE: 08-01-13

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DATE	REVISIONS

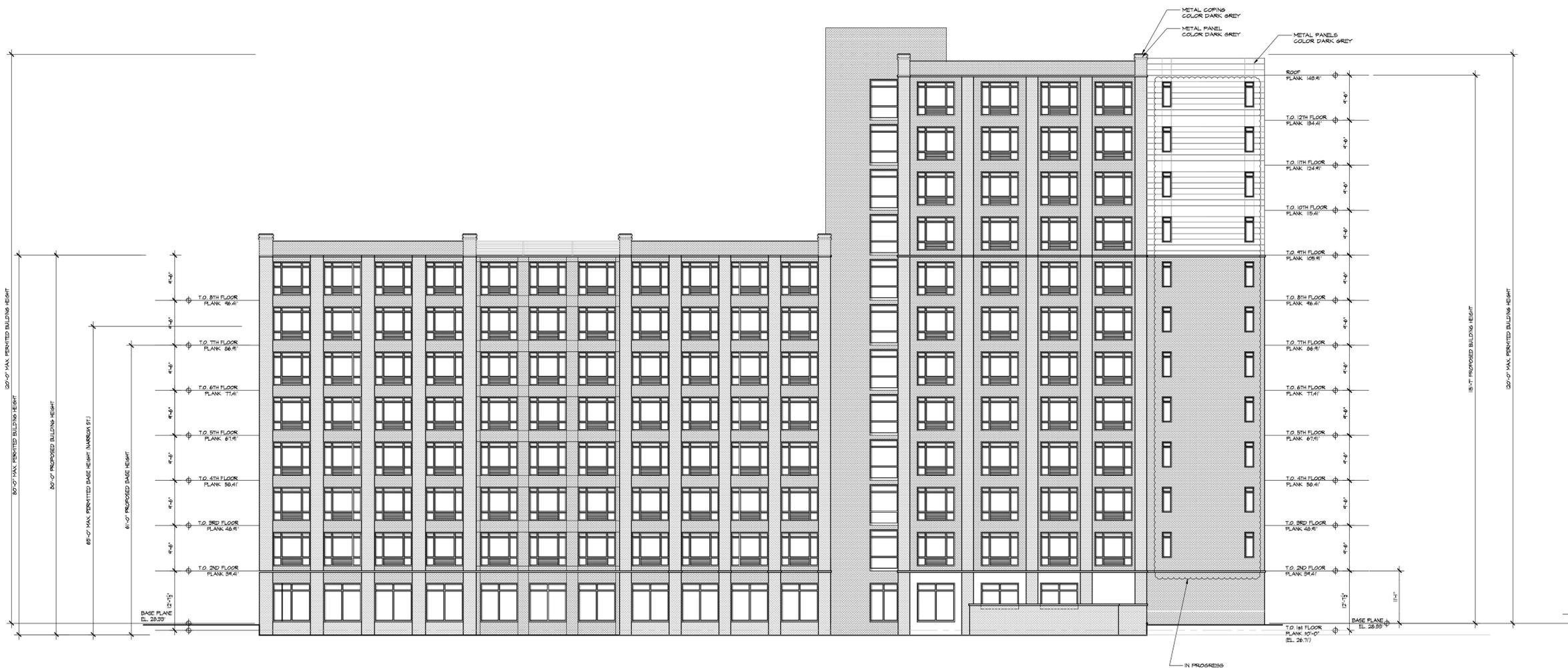
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Architecture and Planning
PLLC

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www.asaparchitecture.com

PROPOSED NEW DEVELOPMENT FOR:
DUMBO
181 FRONT ST., BROOKLYN, NY 11201

FRONT ELEVATION

DATE:	06-11-13
PROJECT NO:	1314
DRAWN BY:	MA
CHECKED BY:	PC
DRAWING NO:	A-200.00
SCALE:	AS NOTED SHEET NO: 9 of 10
NYC DOB NUMBER:	



REAR ELEVATION
SCALE 1/8" = 1'-0"

50% DESIGN DEVELOPMENT PROGRESS SET
DRAWINGS ARE SUBJECT TO CHANGE
DATE: 08-01-13

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DATE	REVISIONS

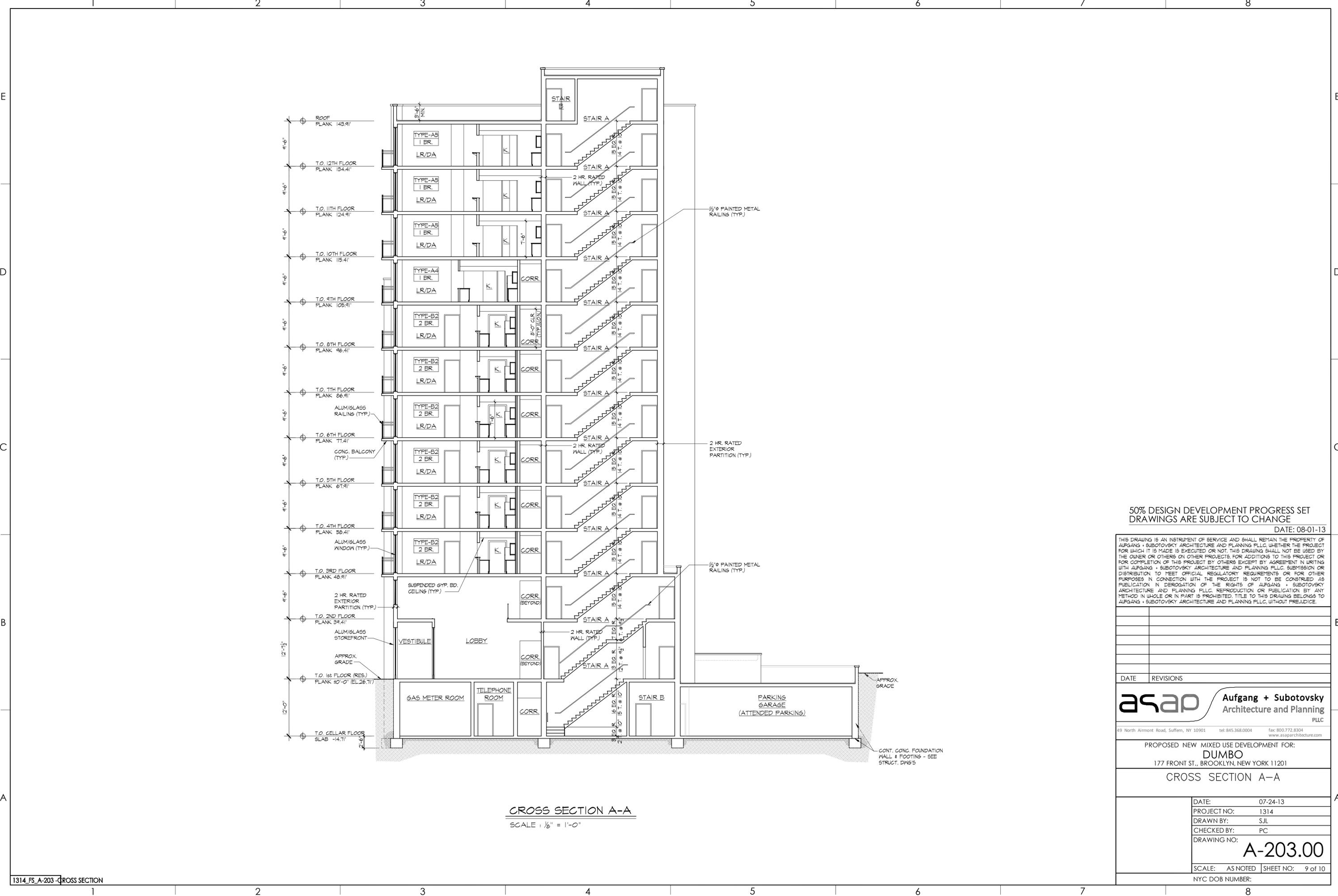
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www.asaparchitecture.com

PROPOSED NEW DEVELOPMENT FOR:
DUMBO
181 FRONT ST., BROOKLYN, NY 11201

REAR ELEVATION

DATE:	05-28-13
PROJECT NO:	1314
DRAWN BY:	MA
CHECKED BY:	PC
DRAWING NO:	A-201.00
SCALE:	AS NOTED SHEET NO: 10 of 10
NYC DOB NUMBER:	



CROSS SECTION A-A
 SCALE : 1/8" = 1'-0"

50% DESIGN DEVELOPMENT PROGRESS SET
 DRAWINGS ARE SUBJECT TO CHANGE
 DATE: 08-01-13

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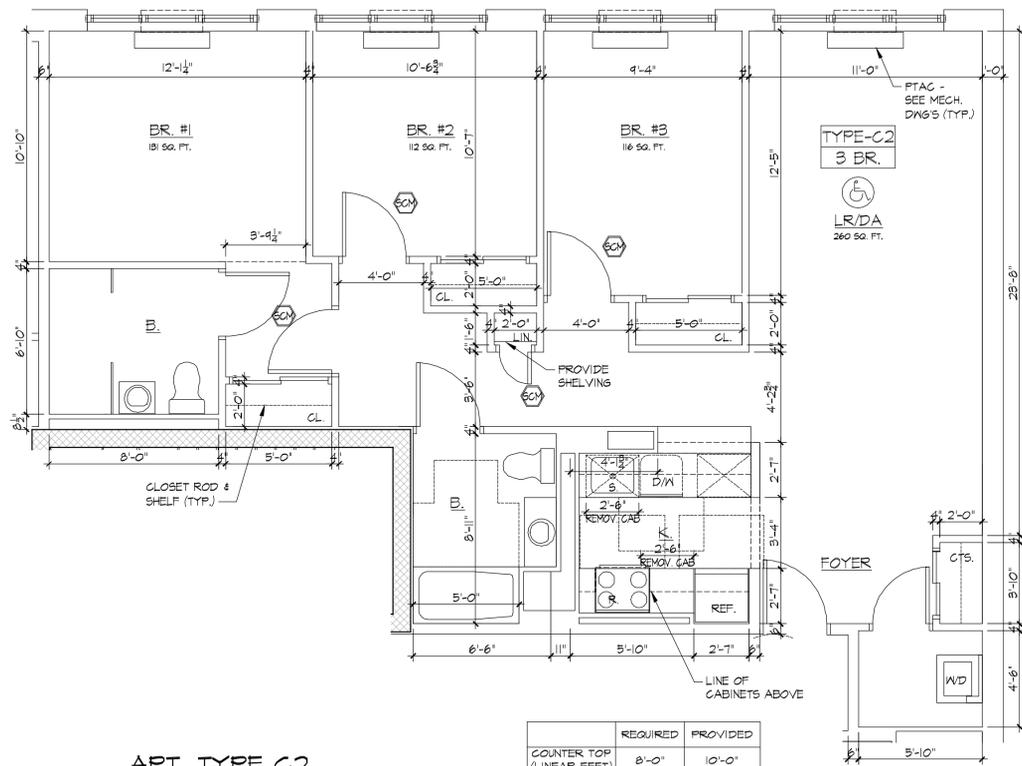
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 PLLC

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 www.asaparchitecture.com

PROPOSED NEW MIXED USE DEVELOPMENT FOR:
DUMBO
 177 FRONT ST., BROOKLYN, NEW YORK 11201

CROSS SECTION A-A

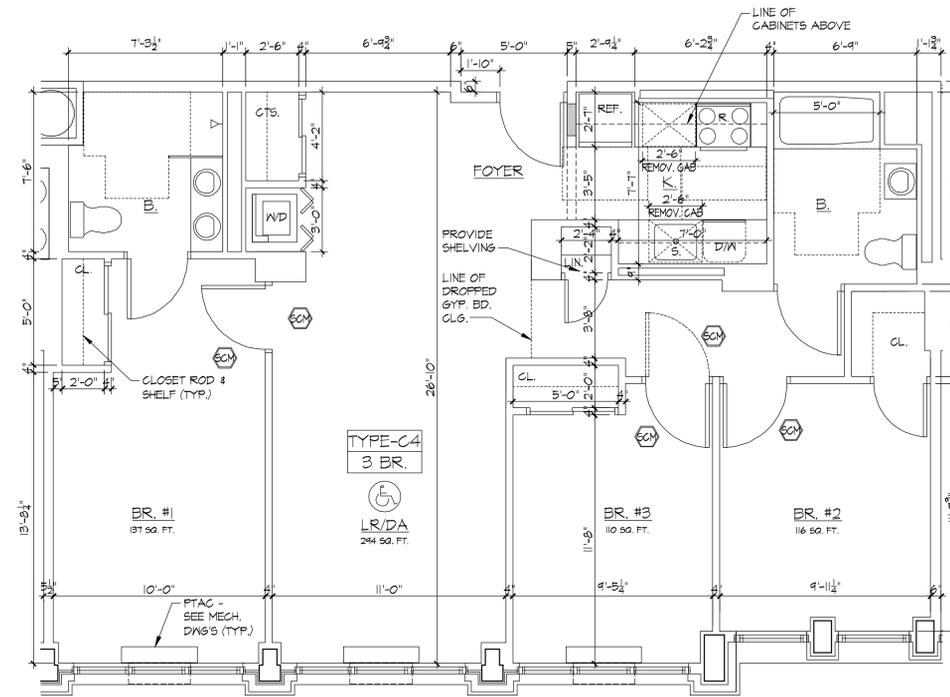
DATE:	07-24-13
PROJECT NO.:	1314
DRAWN BY:	SJL
CHECKED BY:	PC
DRAWING NO.:	A-203.00
SCALE:	AS NOTED
SHEET NO.:	9 of 10
NYC DOB NUMBER:	



APT. TYPE C2
HPD - 3 BR.

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

	REQUIRED	PROVIDED
COUNTER TOP (LINEAR FEET)	8'-0"	10'-0"
SHELVING (LINEAR FEET)	55'-0"	55'-5"



APT. TYPE C4
HPD - 3 BR.

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

	REQUIRED	PROVIDED
COUNTER TOP (LINEAR FEET)	8'-0"	8'-11"
SHELVING (LINEAR FEET)	55'-0"	52'-4"

WALL TYPE LEGEND:

- NON RATED**
- ▲ FURRING AT INTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD OVER 1/2" METAL CHANNELS @ 16" O.C.
 - ▲ TYPICAL PARTITION - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 2 1/2" METAL STUDS @ 16" O.C.
 - ▲ BATHROOM CHASE WALL PARTITION - (1) LAYER 5/8" TYPE "X" WATER RESISTANT GYPSUM BOARD ONE SIDE OF 3/8" METAL STUDS @ 16" O.C.
 - ▲ PARTITION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE OF 3 3/8" METAL STUDS @ 16" O.C. (APARTMENT ELECTRICAL PANEL)
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 3 3/8" GALV. METAL STUDS @ 16" O.C. WITH 3 1/2" (R-15) BATT INSULATION UNFACED
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C.
 - ▲ FURRING AT EXTERIOR CMU WALL - (1) LAYER 5/8" TYPE "X" GYPSUM BOARD ON 1 1/2" GALV. METAL STUDS @ 16" O.C. WITH 1 1/2" SEMI-RIGID INSULATION (R-15) UNFACED

1 HOUR RATED

- ▲ 1 HOUR RATED TENANT SEPARATION PARTITION - (1) LAYER OF 5/8" TYPE "X" GYPSUM BOARD ON (1) SIDE, (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD ON OTHER SIDE OF 3 3/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND STUDS & GYPSUM BOARD UP TO UNDERSIDE OF CONCRETE DECK & SEAL TIGHT TO UNDERSIDE OF CONCRETE/METAL DECK AND/OR ROOF DECK W/ CONT. FIRESTOP SEALANT & FIRESAFING INSULATION (GA FILE #WP-1052) (STC 50-54)
- ▲ 2 HOUR RATED PARTITION - (2) LAYERS OF 5/8" TYPE "X" GYPSUM BOARD, (INSIDE) 3/8" EXP EXTERIOR GYPSUM BOARD SHEATHING (OUTSIDE) OVER 3 3/8" GALV. METAL STUDS @ 16" O.C. WITH 3 1/2" BATT INSULATION (UNFACED) (R-15) (UL-424)
- ▲ 2 HOUR RATED INTERIOR PARTITION - (2) LAYERS 5/8" TYPE "X" GYPSUM BOARD ON EACH SIDE 3 3/8" METAL STUDS @ 16" O.C. WITH 3 1/2" SOUND ATTENUATION INSULATION, EXTEND GYPSUM BOARD & STUDS UP TO UNDERSIDE OF FLOOR METAL DECK OR ROOF DECK, SEAL TIGHT TO DECK W/ CONT. FIRESTOP SEALANT & FIRESAFING. (GA FILE #WP-1522 STC 55-59)
- ▲ 2 HOUR RATED CMU WALL - CMU WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE BLOCK COURSES, SEAL TOP OF CONCRETE/METAL BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE/METAL DECK OR DECK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE GAP EXIST BETWEEN TOP OF WALL AND BOTTOM OF DECK (UL #4906)

3 HOUR RATED

- ▲ 2 HOUR RATED MECHANICAL SHAFT WALL - (2) LAYERS OF 1/2" TYPE "X" GYPSUM BOARD ON ONE SIDE OF 2 1/2" METAL C-H STUDS @ 24" O.C. WITH (1) LAYER OF 1" TYPE "X" GYPSUM LINER PANEL ON SHAFT SIDE, W/ 1" MINERAL FIBER INSULATION IN CAVITY, SEAL TOP OF WALL TIGHT TO UNDERSIDE OF CONCRETE DECK W/ CONT. FIRESTOP SEALANT. (GA FILE #4045) (STC-45-49)
- ▲ 3 HOUR RATED WALL - (1) LAYER 1/2" TYPE "X" GYPSUM BOARD OVER 3/8" METAL HAT CHANNELS @ 24" O.C. OVER 2 HR RATED CONCRETE BLOCK WALL WITH CONT. GALVANIZED HORIZONTAL TRUSS TYPE REINFORCING AT ALTERNATE COURSES, SEAL TOP OF CONCRETE BLOCK WALL TIGHT TO UNDERSIDE OF CONCRETE/METAL FLOOR DECK ABOVE WITH CONT. FIRESTOP SEALANT AND FIRESAFING INSULATION WHERE A GAP EXISTS BETWEEN TOP OF WALL AND BOTTOM OF CONCRETE/METAL DECK (UL #414) (PROVIDE STC RATINGS OF 50-54 COMPACTOR CHUTE FOR SHAFT ADJACENT TO DWELLING UNITS)

GENERAL NOTES:

1. FOR KITCHEN AND TOILET ELEVATIONS SEE DRAWING A-XXX.
2. S.C. SHALL COORDINATE SIZE & LOCATION OF ALL HVAC OPENINGS IN CONG./METAL DECK WITH MECHANICAL DRAWINGS.
3. CONTRACTOR SHALL COORDINATE SIZE AND LOCATION OF ALL MASONRY OPENINGS AT ELEVATOR ENTRANCES WITH ELEVATOR VENDOR.
4. ALL ENLARGED PLAN DIMENSIONS ARE TAKEN FINISH TO FINISH (U.O.N.).

LEGEND:

- CONCRETE FOUNDATION WALL
- CONCRETE BLOCK WALL - 2HR FIRE RATED
- GYPSUM BOARD PARTITION - SEE PLAN FOR SIZE.
- MASONRY VENEER
- REMOVABLE KITCHEN BASE CABINET - 2'-6" WIDE X 2'-0" DEEP
- PARTITION - SEE WALL TYPE LEGEND
- HANDICAP ADAPTABLE APARTMENT UNIT
- U.F.A.S. ACCESSIBLE EFFICIENCY UNIT (TOTAL 6 UNITS)
- U.F.A.S. COMPLIANT H.V.I. EFFICIENCY UNIT - OUTFITTED FOR PEOPLE W/ HEARING OR VISUAL IMPAIRMENTS (TOTAL 2 UNITS)
- 5'-0" DIAMETER CLEAR HANDICAP FLOOR TURNING SPACE.
- 1' FLOOR TURNING SPACE
- 30" x 48" CLEAR FLOOR SPACE
- FIRE RATED SHAFT WALL.
- WINDOW - SEE WINDOW SCHEDULE ON DWS A-601
- DOOR & FRAME - SEE DOOR SCHEDULE DRAWING A-600
- CARBON MONOXIDE DETECTOR
- EXIT LIGHT AND SIGN - CEILING MOUNTED
- ELECTRICAL PANEL UNIT
- SUSPENDED GYPSUM BOARD

50% DESIGN DEVELOPMENT PROGRESS SET
DRAWINGS ARE SUBJECT TO CHANGE

DATE: 08-01-13

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DATE	REVISIONS
07-19-13	ISSUED TO HPD FOR REVIEW AND COMMENT

asap Aufgang + Subotovsky
Architecture and Planning
PLLC

49 North Airmont Road, Suffern, NY 10901 | tel: 845.368.0004 | fax: 800.772.8304
www.asaparchitecture.com

PROPOSED NEW MIXED USE DEVELOPMENT FOR:
DUMBO
177 FRONT ST., BROOKLYN, NEW YORK 11201

HPD APARTMENT LAYOUTS C2 & C4

DATE:	07-19-13
PROJECT NO:	1340
DRAWN BY:	SCR
CHECKED BY:	
DRAWING NO:	A-502.00
SCALE:	AS NOTED
SHEET NO:	13 of 13
NYC DOB NUMBER:	

APPENDIX 5

VAPOR BARRIER DESIGN SPECIFICATIONS

According to information provided by the Developer, the entire Site is to be excavated to a depth of 12-feet for cellar storage and automobile parking. A 20-mil vapor barrier will be installed beneath the concrete slab of the cellar, and along the sub-surface walls of the cellar. The selected vapor barrier is the Stego® Wrap Vapor Barrier manufactured by Stego Industries, LLC. Installation will be performed according to the manufacturer's specifications. A Copy of the Stego® Wrap Vapor Barrier specifications and installation instructions is attached.

References and Standards for the Vapor Barrier

American Society for Testing and Materials (ASTM):

1. ASTM E 1745-09 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
2. ASTM E 1643-10 Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

American Concrete Institute (ACI):

1. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

Materials

The following vapor barrier materials are provided by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.

1. Stego Wrap Vapor Barrier (15-mil)
2. Stego Tape
3. Stego Mastic
4. Stego CreteClaw Tape
5. Stego Tack Tape
6. Stego Term Bar

Material specifications and cut sheets are present in Appendix C.

Installation

1. The Stego Wrap can be installed directly over an aggregate, sand or tamped earth base. The base material should be level and compact per the geotechnical engineering specifications.
2. Install vapor barrier in accordance with manufacturer's instructions and ASTM E 1643.

3. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement. The vapor barrier should completely cover the concrete placement area.
4. All joints/seams both lateral and butt should be overlapped 6 inches and seal with manufacturer's tape. The area of adhesion should be free of dust, dirt and moisture to ensure maximum adhesion of tape.
5. The vapor barrier shall be continuous to prevent vapor intrusion. The vapor barrier shall be placed completely beneath the concrete floor area and exterior sub-grade walls up to street level.
6. Extend vapor barrier over the top of grade beams to a distance acceptable to the structural engineer and terminate as recommended by the manufacturer.
7. Seal around all penetrations such as utility conduits and drainage pipes per manufacturer's instructions.
8. Care should be undertaken to prevent damage to the vapor barrier during construction, including installation of reinforcing steel, utilities and concrete.
9. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged area 6 inches and taping all sides with tape per manufacturer's instructions.

Inspection

Subsequent to installation, prior to concrete placement, the contractor shall coordinate an inspection with the Engineer or its designated representative. The membrane shall not be covered until the contractor has received approval from the Engineer.



Stego® Wrap 20-Mil Vapor Barrier

STEGO INDUSTRIES, LLC



Vapor Retarders
07 26 00, 03 30 00

1. Product Name

Stego Wrap 20-Mil Vapor Barrier

2. Manufacturer

Stego Industries, LLC
216 Avenida Fabricante, Suite 101
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description

USES: Stego Wrap 20-Mil Vapor Barrier is used as a below-slab vapor barrier, and as a protection course for below grade waterproofing applications.

COMPOSITION: Stego Wrap 20-Mil Vapor Barrier is a multi-layer plastic extrusion manufactured with only the highest grade of prime, virgin, polyolefin resins.

ENVIRONMENTAL FACTORS:

Stego Wrap 20-Mil Vapor Barrier can be used in systems for the control of soil gases (radon, methane), soil poisons (oil by-products) and sulfates.

5. Installation

UNDER SLAB: Unroll Stego Wrap 20-Mil Vapor Barrier over an aggregate, sand or tamped earth base. Overlap all seams a minimum of six inches and tape using Stego Tape or Crete Claw® Tape. All penetrations must be sealed using a combination of Stego Wrap and Stego accessories.

For additional information, please refer to Stego's complete installation instructions.

6. Availability & Cost

Stego Wrap 20-Mil Vapor Barrier is available nationally via building supply distributors. For current cost information, contact your local Stego Wrap distributor or Stego Industries' sales department.

7. Warranty

Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are

accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance

None required.

9. Technical Services

Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or via the website.

4. Technical Data

TABLE 1: PHYSICAL PROPERTIES OF STEGO WRAP 20-MIL VAPOR BARRIER

PROPERTY	TEST	RESULTS
Under Slab Vapor Retarders	ASTM E 1745 Class A, B & C – Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs	Exceeds Class A, B & C
Water Vapor Permeance	ASTM F 1249 – Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor	0.0071 perms
Puncture Resistance	ASTM D 1709 – Test Methods for Impact Resistance of Plastic Film by Free-Falling Dart Method	3500+ grams*
Tensile Strength	ASTM D 882 – Test Method for Tensile Properties of Thin Plastic Sheeting	97.7 lbf/in.
Permeance After Conditioning (ASTM E 1745 Sections 7.1.2 - 7.1.5)	ASTM E 154 Section 8, F 1249 – Permeance after wetting, drying, and soaking ASTM E 154 Section 11, F 1249 – Permeance after heat conditioning ASTM E 154 Section 12, F 1249 – Permeance after low temperature conditioning ASTM E 154 Section 13, F 1249 – Permeance after soil organism exposure	0.0088 perms 0.0081 perms 0.0084 perms 0.0077 perms
Thickness	ACI 302.1R-04 – Minimum Thickness (10 mils)	20 mils
Roll Dimensions		14 ft. wide x 105 ft. long or 1,470 ft ²
Roll Weight		140 lbs.

Note: perm unit = grains/(ft² *hr* in.Hg)

* The material maxed out the testing equipment and did not fail at 3746 grams.





Stego® Mastic

STEGO INDUSTRIES, LLC



Vapor Retarders
07 26 00, 03 30 00

1. Product Name

Stego Mastic

2. Manufacturer

Stego Industries, LLC
216 Avenida Fabricante, Suite 101
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description

USES: Stego Mastic is designed to be used as a waterproofing and vapor retardant membrane for use in conjunction with Stego Wrap 10-mil and 15-mil Vapor Retarder/Barrier. Stego Mastic can be used as an alternate to boots for pipe penetrations in Stego Wrap Vapor Barrier.

COMPOSITION: Stego Mastic is a medium-viscosity, water-based, polymer-modified anionic bituminous/asphalt emulsion, which exhibits bonding, elongation and water-proofing characteristics.

SIZE: Stego Mastic comes in five-gallon buckets.

4. Technical Data

APPLICABLE STANDARDS:

American Society for Testing and Materials (ASTM)

- ASTM D 412 Standard Test Method for Vulcanized Rubber and Thermoplastic Elastomers - Tension
- ASTM E 154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth under Concrete Slabs, on Walls, or as Ground Cover
- ASTM G 23 Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials (Withdrawn 2000)
- ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials
- ASTM D 751 Standard Test Methods for Coated Fabrics
- ASTM D 1434 Standard Test Method for Determining Gas Permeability Characteristics of Plastic Film and Sheeting
- ASTM C 836 Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Water-proofing

Membrane for Use with Separate Wearing Course.

- ASTM E 1643 Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.

5. Installation

PREPARATION:

- A test application simulating the project environment should always be done prior to final usage of Stego Mastic.
- All Surfaces should be dry and free of loose materials, oils and other contaminants. The surfaces should be cleaned in the same fashion as the test surface in order to ensure proper results.
- Store above 40°F

PENETRATIONS:

For small pipe and rebar penetrations in Stego Wrap Vapor Barrier cut Stego Wrap just big enough for the penetration. Liberally apply Stego Mastic around the penetration to keep the integrity of the membrane intact. Stego Mastic can be applied by brush, roller, or sprayer.

NOTES: 1) For larger penetrations or wide cut-outs of Stego Wrap, use Stego Wrap and Stego Tape to repair and seal. 2) Solvent-based products should not be applied over this product. 3) Clean all tools with kerosene and/or oil-based cleaners.

For additional information, please refer to Stego's complete installation instructions.

6. Availability & Cost

Stego Mastic is available nationally via building supply distributors. For current cost information, contact your local Stego distributor or Stego Industries' sales department.

7. Warranty

Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance

None required.

9. Technical Services

Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or by visiting the website.

10. Filing Systems

- Stego Industries' website
- Buildsite

TABLE 1: PHYSICAL PROPERTIES OF STEGO MASTIC

Property and Test	Stego Mastic
Tensile/Elongation, ASTM D 412	32 psi / 3860%
Resistance to Decay, ASTM E 154	9% perm loss
Accelerated Aging, ASTM G 23	No Effect
Permeance, ASTM E 96	0.17 Perms
Hydrostatic Water Pressure, ASTM D 751	28 psi
Methane Transmission Rate, ASTM D 1434	0
Adhesion to Concrete & Masonry, ASTM C 836	7 lbf./in.
Hardness, ASTM C 836	85
Crack Bridging, ASTM C 836	No Cracking
Low Temp Flexibility, ASTM C 836	No Cracking at -20°C
Resistance to Acids:	
Acetic	30%
Sulfuric and Hydrochloric	15%
Temperature Effect:	
Stable	248°F
Flexible	13°F

Note: perm unit = grains/(ft² *hr* in.Hg)





Stego® Tape
STEGO INDUSTRIES, LLC



Vapor Retarders
07 26 00, 03 30 00

1. Product Name
Stego Tape

2. Manufacturer

Stego Industries, LLC
216 Avenida Fabricante, Suite 101
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description

USES: Stego Tape is a low permeance tape designed for protective sealing, hanging, seaming, splicing, and patching applications where a highly conformable material is required. It has been engineered to bond specifically to Stego Wrap, making it ideal for sealing Stego Wrap seams and penetrations.

COMPOSITION: Stego Tape is composed of polyethylene film and an acrylic, pressure-sensitive adhesive.

SIZE: Stego Tape is 3.75" wide and 180' long. Stego Tape ships 12 rolls in a case.

4. Technical Data

APPLICABLE STANDARDS:

Pressure Sensitive Tape Council (PSTC)

- PSTC 101 – International Standard for Peel Adhesion of Pressure Sensitive Tape

American Society for Testing & Materials (ASTM)

- ASTM E 1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs

5. Installation

SEAMS:

Overlap Stego Wrap six inches and seal with Stego Tape. Make sure the area of adhesion is free from dust, dirt, moisture and frost to allow maximum adhesion of the pressure sensitive tape.

PIPE PENETRATION SEALING

- 1) Install Stego Wrap around pipe by slitting/cutting material
- 2) If void space around pipe is minimal, seal around base of pipe with Stego Tape (Stego Mastic can be used for additional coverage)

DETAIL PATCH FOR PIPE PENETRATION SEALING

- 1) Cut a piece of Stego Wrap that creates a six inch overlap around all edges of the void space
- 2) Cut an "X" in the center of the detail patch
- 3) Slide detail patch over pipe, secure tightly
- 4) Tape down all sides of detail patch with Stego Tape
- 5) Seal around base of pipe with Stego Tape (Stego Mastic can be used for additional coverage)

Stego Tape should be installed above 40°F. In temperatures below 40°F, take extra care to remove moisture or frost from the area of adhesion.

For additional information, please refer to Stego's complete installation instructions.



6. Availability & Cost

Stego Tape is available nationally via building supply distributors. For current cost information, contact your local Stego distributor or Stego Industries' sales department.

7. Warranty

Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance

None required.

9. Technical Services

Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or by visiting the website.

10. Filing Systems

- Stego Industries' website
- Buildsite

TABLE 1: PHYSICAL PROPERTIES OF STEGO TAPE

PROPERTY	RESULTS
Total Thickness	6 mils
Permeance	0.03 perms
Tensile Strength	17 lbs./in. width
Elongation (at break) MD	1060%
Adhesion (20 min dwell ss, PSTC 101)	95-oz./in. width
Ultraviolet Resistance	Excellent





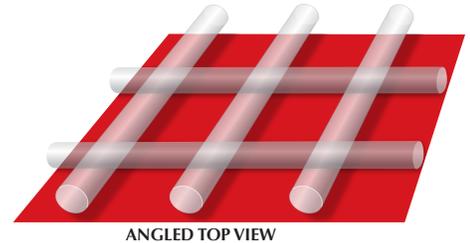
STEGO CRETE CLAW® TAPE

Stego Crete Claw® Tape provides an innovative and economical way to secure plastic film to concrete while the concrete is still wet.

Crete Claw is a multi-layered tape/detail strip that will mechanically lock Stego Wrap Vapor Barrier to concrete. The patent-pending design allows wet concrete to cast into the textured surface of Crete Claw. Just stick Crete Claw to Stego Wrap prior to concrete placement, then place the concrete directly over the system.

Stego Crete Claw can be used in place of Stego Tape to seal joints in Stego Wrap Vapor Barrier providing a dual purpose and helping to offset costs.

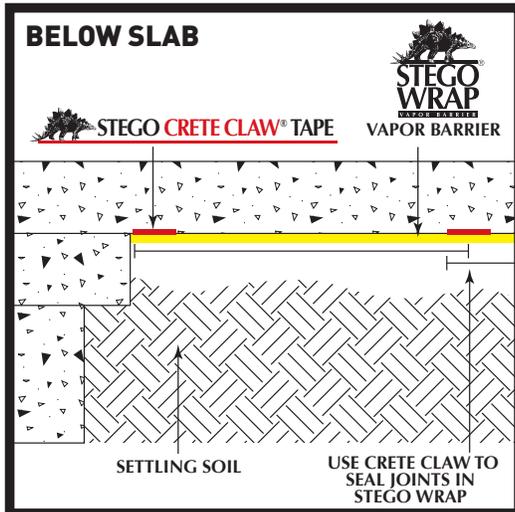
The patent-pending design allows wet concrete to cast into the textured surface of Crete Claw



MOST COMMON APPLICATIONS FOR CRETE CLAW® 6" Wide 3" Wide

ASTM E 1643 - Forming seal to the slab at perimeter	✓	✓
Securing Stego Wrap to bottom of slab for expansive/settling soils and carton/void form applications	Perimeter	✓
	Seams	✓

-  Quick and easy to install
-  Saves time and money
-  Innovative Solution to help meet ASTM E 1643



Other more expensive products rely on chemical reaction or geotextile to bond with concrete making it all but impossible to properly install the vapor barrier. Often in pursuit of the all-in-one product, the performance characteristics of the vapor barrier are compromised. Because Crete Claw Tape is applied as a separate accessory to the vapor barrier, it does not interfere with the ability to detail around penetrations or repair damaged areas.

TABLE 1: CRETE CLAW TAPE TEST RESULTS

PROPERTY	TEST	RESULTS
Total Thickness		26 mils
Permeance	ASTM F 1249	0.03 perms
180° Adhesion Peel Strength	ASTM D 903	17.6 lbf/in.
Shear Adhesion Strength	1 in. ² shear test using an Instron 3345 Machine	>49 lbf/in. ² *
Roll Sizes		6" x 180' and 3" x 180' **

* Specimens failed by stretching vapor barrier to failure before pulling Crete Claw from concrete.

** 3" wide is for perimeter seal application only.

Contact us to learn more about this innovative product.

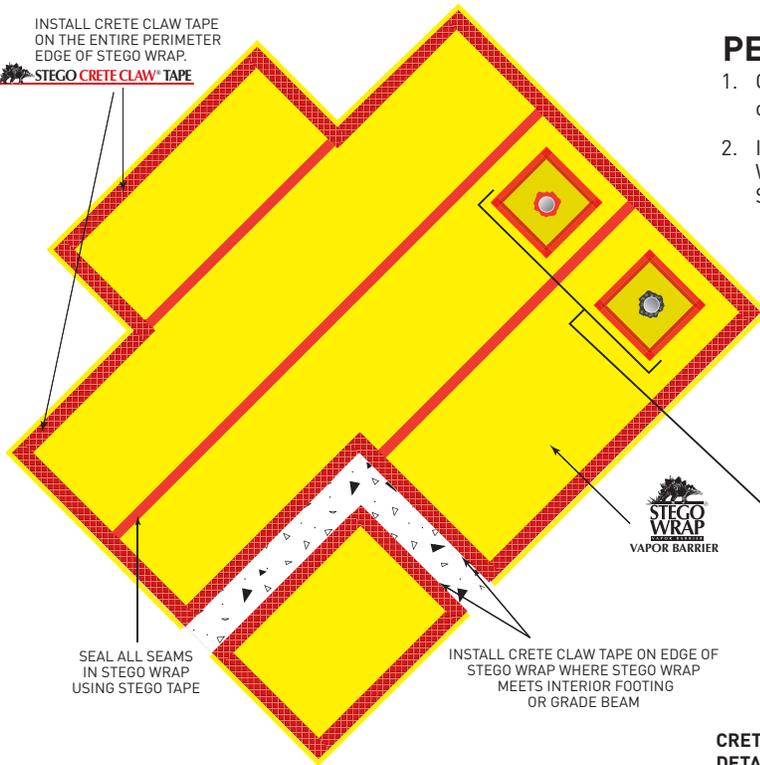
STEGO CRETE CLAW® TAPE

INSTALLATION INSTRUCTIONS

TOP-DOWN VIEWS OF A BUILDING FOOTPRINT



INSTALL CRETE CLAW TAPE ON THE ENTIRE PERIMETER EDGE OF STEGO WRAP.
STEGO CRETE CLAW® TAPE



SEAL ALL SEAMS IN STEGO WRAP USING STEGO TAPE

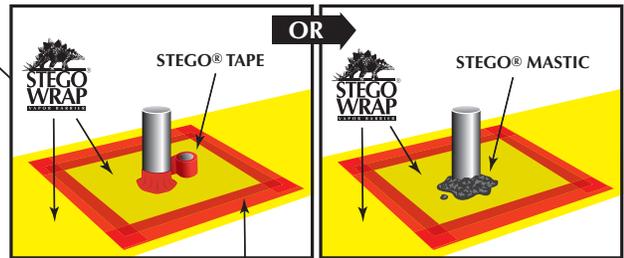
INSTALL CRETE CLAW TAPE ON EDGE OF STEGO WRAP WHERE STEGO WRAP MEETS INTERIOR FOOTING OR GRADE BEAM



PERIMETER SEAL TO SLAB

1. Clean surface of Stego Wrap to ensure that it is free of moisture and debris prior to the installation of Crete Claw Tape.
2. Install 3" or 6" Crete Claw Tape on the entire perimeter of the Stego Wrap Installation. Crete Claw Tape should be completely on Stego Wrap.

SEAL ALL PENETRATIONS WITH STEGO TAPE AND/OR STEGO MASTIC. CRETE CLAW TAPE IS NOT MEANT FOR REPAIRING PENETRATIONS.



CRETE CLAW CAN BE USED TO SEAL SEAM AROUND DETAIL PATCH FOR ADDED PROTECTION.

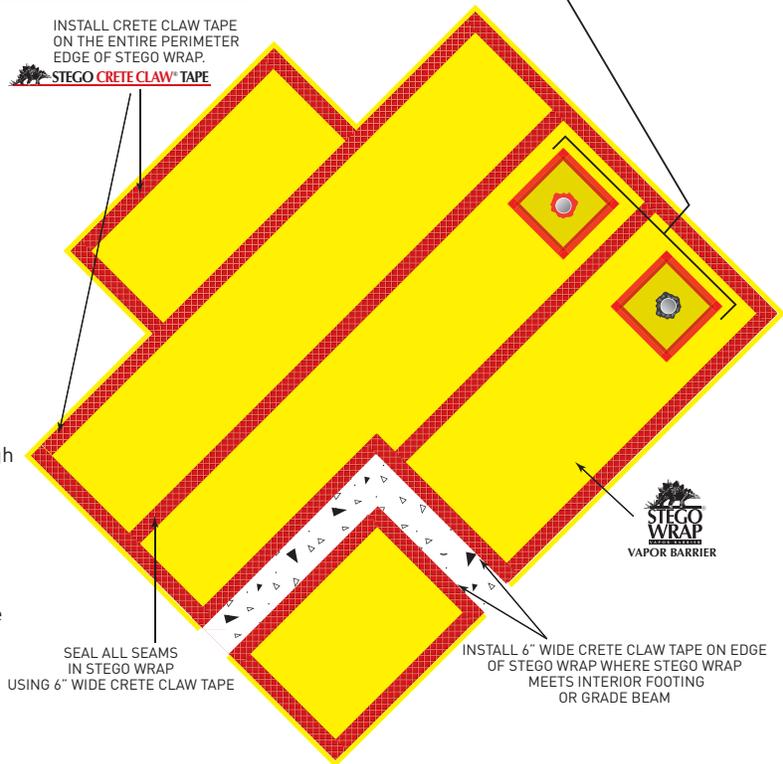
SECURING STEGO WRAP TO THE BOTTOM OF THE SLAB

1. Clean surface of Stego Wrap to ensure that it is free of moisture and debris prior to the installation of 6" wide Crete Claw Tape.
2. Overlap seams a minimum of 6 inches. Seal all seams in Stego Wrap using Crete Claw Tape.
3. Install 6" wide Crete Claw Tape on the entire perimeter of the Stego Wrap Installation. Crete Claw Tape should be completely on Stego Wrap.
4. Install additional Crete Claw Tape if required. Lab and simulated field tests have shown that if 6" wide Crete Claw is installed on all seams and around the perimeter, then it is more than strong enough to support Stego Wrap. If determined by the architect or engineer, additional Crete Claw may be specified.
5. Prior to the placement of concrete, ensure that Crete Claw is free of dirt or debris to ensure maximum bond to the concrete.

These are general instructions. Installation requirements may change on a project-by-project basis

IMPORTANT - For the application of securing Stego Wrap to the bottom of the slab, always use 6" wide Crete Claw Tape.

INSTALL CRETE CLAW TAPE ON THE ENTIRE PERIMETER EDGE OF STEGO WRAP.
STEGO CRETE CLAW® TAPE



SEAL ALL SEAMS IN STEGO WRAP USING 6" WIDE CRETE CLAW TAPE

INSTALL 6" WIDE CRETE CLAW TAPE ON EDGE OF STEGO WRAP WHERE STEGO WRAP MEETS INTERIOR FOOTING OR GRADE BEAM



NOTE: Stego Industries, LLC's ("Stego") installation instructions are based on ASTM E 1643 - *Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs*. These instructions are meant to be used as a guide, and do not take into account specific job site situations. Consult local building codes and regulations along with the building owner or owner's representative before proceeding. If you have any questions regarding the above mentioned installation instructions, Stego products, please call us at 877-464-7834 for technical assistance. While Stego employees and representatives may provide technical assistance regarding the utility of a specific installation practice or Stego product, they are not authorized to make final design decisions.



Stego® Crete Claw® Tape

STEGO INDUSTRIES, LLC



Vapor Retarders
07 26 00

1. Product Name

Stego® Crete Claw® Tape

2. Manufacturer

Stego Industries, LLC
216 Avenida Fabricante, Suite 101
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description

USES: Stego Crete Claw Tape is a multi-layered tape that is used to seal Stego Wrap to concrete while the concrete is still wet. Crete Claw allows wet concrete to cast into the textured top surface to form a mechanical bond/seal. **COMPOSITION:** Stego Crete Claw is composed of polyethylene film, aperture film, and an acrylic, pressure sensitive adhesive. **SIZE:** Stego Crete Claw is 6" wide by 180' long. Stego Crete Claw ships 8 rolls in a case.

4. Technical Data

TABLE 1: PHYSICAL PROPERTIES OF STEGO CRETE CLAW

PROPERTY	RESULTS
Dimensions	6" x 180'
Total Thickness	26 mils
Permeance: ASTM F 1249	0.03 perms
180° Adhesion Peel Strength: ASTM D 903	17.6 lbf/in.
Shear Adhesion Strength: 1 in ² shear test using an Instron 3345 Machine	>49 lbf/in ² *

* Specimens failed by stretching vapor barrier to failure before pulling Crete Claw from concrete.

5. Installation

SECURING STEGO WRAP TO SLAB: Clean the surface of Stego Wrap to ensure that it is free of moisture, frost, dirt, and debris prior to the installation of Stego Crete Claw. When ready to apply Crete Claw, peel back the release liner and apply to Stego Wrap. Stego Crete Claw should be completely on Stego Wrap.

Install Crete Claw Tape on all seams and around the entire perimeter of the Stego Wrap installation.

To detail, cut Stego Crete Claw with a box knife or scissors. Crete Claw should be installed above 40°F for maximum adhesion. For additional information, please refer to Stego's complete installation instructions.

TIP: Wrap the release liner back over the entire roll while unrolling Crete Claw. This technique will allow the release liner to pull off easily and keep it out of the way.

6. Availability & Cost

Stego Crete Claw is available nationally through our network of building supply distributors. For current cost information, contact your local Stego Wrap distributor or Stego Industries' Sales Representative.

7. Warranty

Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance

Store Stego Crete Claw in a dry and temperate area.

9. Technical Services

Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical department or via our website.

10. Filing Systems

www.stegoindustries.com
Buildsite





Stego® Crete Claw® (3" Wide)

STEGO INDUSTRIES, LLC



Vapor Retarders
07 26 00

1. Product Name

Stego® Crete Claw® (3" Wide)

2. Manufacturer

Stego Industries, LLC
216 Avenida Fabricante, Suite 101
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description

USES: Stego Crete Claw is a multi-layered tape that is used to seal Stego Wrap to the perimeter of the slab while the concrete is placed. Crete Claw allows wet concrete to cast into the textured top surface to form a mechanical bond/seal.
COMPOSITION: Stego Crete Claw is composed of polyethylene film, aperture film, and an acrylic, pressure sensitive adhesive.
SIZE: Stego Crete Claw (3" Wide) is 3" wide and 180' long. Stego Crete Claw (3" Wide) ships 16 rolls in a case.

4. Technical Data

TABLE 1: PHYSICAL PROPERTIES OF STEGO CRETE CLAW (3" Wide)

PROPERTY	RESULTS
Dimensions	3" x 180'
Total Thickness	26 mils
Permeance: ASTM F 1249	0.03 perms
180° Adhesion Peel Strength: ASTM D 903	17.6 lbf/in.
Shear Adhesion Strength: 1 in ² shear test using an Instron 3345 Machine	>49 lbf/in ² *

* Specimens failed by stretching vapor barrier to failure before pulling Crete Claw from concrete.

5. Installation

UNDER SLAB: Clean surface of Stego Wrap to ensure that it is free of moisture, frost, dirt, and debris prior to the installation of Stego Crete Claw. When ready to apply Crete Claw, peel back the release liner and apply to Stego Wrap. Stego Crete Claw should be completely on Stego Wrap.

To detail, cut Stego Crete Claw with a box knife or scissors. Crete Claw should be installed above 40°F for maximum adhesion. For additional information please refer to Stego's complete installation instructions.

TIP: Wrap the release liner back over the entire roll while unrolling Crete Claw. This technique will allow the release liner to pull off easily and keep it out of the way.

6. Availability & Cost

Stego Crete Claw (3" Wide) is available nationally through our network of building supply

distributors. For current cost information, contact your local Stego Wrap distributor or Stego Industries' Sales Representative.

7. Warranty

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8. Maintenance

Store Stego Crete Claw in a dry and temperate area.

9. Technical Services

Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical department or via our website.

10. Filing Systems

www.stegoindustries.com
Buildsite





StegoTack® Tape

STEGO INDUSTRIES, LLC



Vapor Retarders
07 26 00, 03 30 00

1. Product Name

StegoTack® Tape

2. Manufacturer

Stego Industries, LLC
 216 Avenida Fabricante, Suite 101
 San Clemente, CA 92672
 Sales, Technical Assistance
 Ph: (877) 464-7834
 Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description

USES: StegoTack Tape is a double-sided adhesive strip used to bond and seal Stego Wrap to concrete, masonry, wood, metal, and other surfaces. StegoTack is a flexible and moldable material to allow for a variety of applications and installations.

COMPOSITION: StegoTack Tape is made from a blend of synthetic rubber and resins. **SIZE:** StegoTack Tape is 2 inches wide and 50 feet long. StegoTack Tape ships 12 rolls in a case.

5. Installation

TO WALLS: Make sure the area of

adhesion is free of dust, dirt, debris, moisture, and frost to allow maximum adhesion. Remove release liner on one side and stick to desired surface. When ready to apply Stego Wrap, remove the exposed release liner and press Stego Wrap firmly against StegoTack Tape to secure.

TO FOOTINGS: Make sure the area of adhesion is free of dust, dirt, debris, moisture, and frost to allow maximum adhesion. Remove release liner on one side and stick to desired surface. When ready to apply Stego Wrap, remove the exposed release liner and press Stego Wrap firmly against StegoTack Tape to secure.

Cut StegoTack Tape using a utility knife or scissors. Cut StegoTack Tape before removing the release liner for easier cutting. Install StegoTack Tape between 40°F and 110°F. For additional information please refer to Stego's complete installation instructions.

6. Availability & Cost

StegoTack Tape is available nationally through our network of building supply distributors. For current cost information, contact your local Stego

Wrap distributor or Stego Industries' Sales Representative.

7. Warranty

Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance

For longer adhesive life, store in dry, temperate area.

9. Technical Services

Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or via the website. www.stegoindustries.com

10. Filing Systems

www.stegoindustries.com
 Buildsite

4. Technical Data

TABLE 1: PHYSICAL PROPERTIES OF STEGOTACK TAPE

PROPERTY	RESULTS
Dimensions	50 feet long, 2 inches wide
Total Thickness	30 Mils
Permeance	0.03 perms (30 mils)
Color	Grey
Material	Synthetic rubber blend
Adhesion to Steel	10.3 lbs./in. width ASTM C 1000
Installation Temperature	40°F/110°F (4°C/43°C)
In Service Temperature Range	-20°F/+140°F (-29°C/60°C)
VOC Content	No VOC's, 100% solids





Stego® Term Bar

STEGO INDUSTRIES, LLC



Vapor Retarders
07 26 00, 03 30 00

1. Product Name
Stego Term Bar

2. Manufacturer
 Stego Industries, LLC
 216 Avenida Fabricante, Suite 101
 San Clemente, CA 92672
 Sales, Technical Assistance
 Ph: (877) 464-7834
 Fx: (949) 257-4113
 www.stegoindustries.com

3. Product Description
 USES: Stego Term Bar is a semi-flexible plastic termination bar used for mechanically securing Stego Wrap or other materials to concrete, masonry, or wood.
 COMPOSITION: Stego Term Bar is made from post-industrial recycled PVC.

5. Installation
 UNDER SLAB: Nail through Stego Term Bar and Stego Wrap to secure material as needed. If the beveled edge is facing the wall, a pocket/lip is created for mastic/sealant to be used if required.

Pre-drilled nail holes are provided every 6 inches for ease of installation.

To cut Stego Term Bar, score with a utility knife or wire snips. Stego Term Bar can be bent back and forth and then broken at desired locations as well. Stego Term Bar is flexible enough to bend around corners and contours in the wall for easy installation.

For additional information, please refer to Stego's complete installation instructions.

6. Availability & Cost
 Stego Term Bar is available nationally through our network of building supply distributors. For current cost information, contact your local Stego Wrap distributor or Stego Industries' Sales Representative.

7. Warranty
 Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are

accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance
 Store above 60°F. Term Bar will become less flexible at lower temperatures.

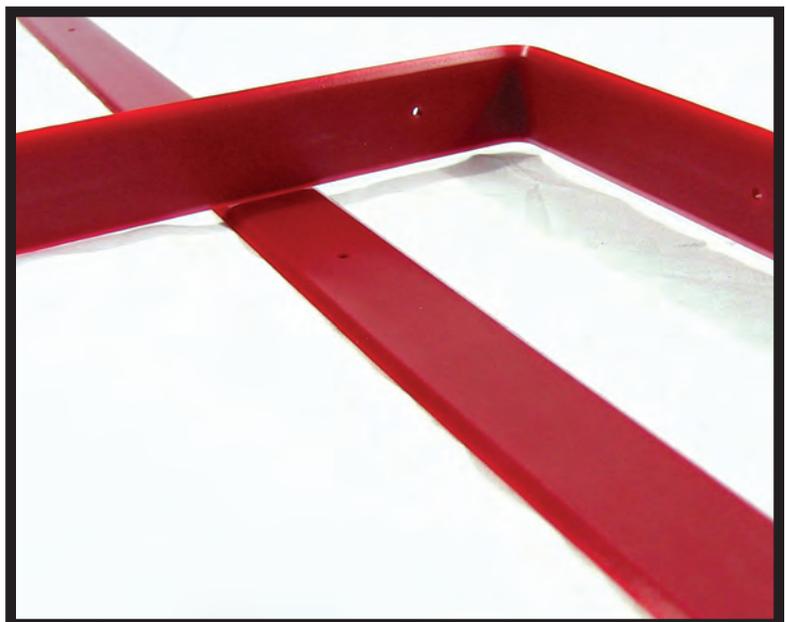
9. Technical Services
 Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or via the website. www.stegoindustries.com

10. Filing Systems
www.stegoindustries.com

4. Technical Data

TABLE 1: PHYSICAL PROPERTIES OF STEGO TERM BAR

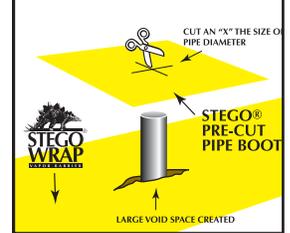
PROPERTY	RESULTS
Dimensions	4 feet long, 1 1/8 inches wide
Color	Red
Material	Recycled PVC
Weight	4.7 oz. (132 grams)





Stego® Pre-Cut Pipe Boots

STEGO INDUSTRIES, LLC



Vapor Retarders
07 26 00, 03 30 00

1. Product Name
Stego Pre-Cut Pipe Boots

2. Manufacturer
 Stego Industries, LLC
 216 Avenida Fabricante, Suite 101
 San Clemente, CA 92672
 Sales, Technical Assistance
 Ph: (877) 464-7834
 Fx: (949) 257-4113
 www.stegoindustries.com

3. Product Description
 USES: Stego Pre-Cut Pipe Boots are used to seal around permanent penetrations in Stego Wrap.
 COMPOSITION: Stego Pre-Cut Pipe Boots are made from Stego Wrap Vapor Barrier (15-mil), and therefore are manufactured from only high grade prime, virgin, polyolefin resins.
 SIZE: Stego Pre-Cut Pipe Boots are 18" by 18" and 15 mils thick. Stego Pre-Cut Pipe Boots ship 10 packs of 25 in a case (250 boots per case).

5. Installation
 UNDER SLAB: Cut an "X" the size of the pipe diameter in the center of the Pre-Cut Pipe Boot and slide tightly over pipe. Tape all sides of the pipe boot with Stego Tape. Seal around the base of the pipe using Stego tape and/or Stego Mastic.

For additional information, please refer to Stego's complete installation instructions.

6. Availability & Cost
 Stego Pre-Cut Pipe Boots are available nationally through our network of building supply distributors. For current cost information, contact your local Stego Wrap distributor or Stego Industries' Sales Representative.

7. Warranty
 Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since

site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance
 None required.

9. Technical Services
 Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or via the website. www.stegoindustries.com

4. Technical Data

TABLE 1: PHYSICAL PROPERTIES OF STEGO PRE-CUT PIPE BOOTS

PROPERTY	TEST	RESULTS
Under Slab Vapor Retarders	ASTM E 1745 Class A, B & C - Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs	Exceeds Class A, B & C
Water Vapor Permeance	ASTM F 1249 - Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor	0.0086 perms *0.0036 WVTR
Puncture Resistance	ASTM D 1709 - Test Methods for Impact Resistance of Plastic Film by Free-Falling Dart Method	2266 grams
Tensile Strength	ASTM D 882 - Test Method for Tensile Properties of Thin Plastic Sheeting	70.60 lbf/in.
Permeance After Conditioning (ASTM E 1745 Sections 7.1.2 - 7.1.5)	ASTM E 154 Section 8, F 1249 - Permeance after wetting, drying, and soaking ASTM E 154 Section 11, F 1249 - Permeance after heat conditioning ASTM E 154 Section 12, F 1249 - Permeance after low temperature conditioning ASTM E 154 Section 13, F 1249 - Permeance after soil organism exposure	0.0098 perms 0.0091 perms 0.0097 perms 0.0095 perms
Thickness	ACI 302.1R-04 - Minimum Thickness (10 mils)	15 mils
Pipe Boot Dimensions		18" x 18"

Note: perm unit = grains/(ft² *hr* in.Hg) * WVTR = Water Vapor Transmission Rate



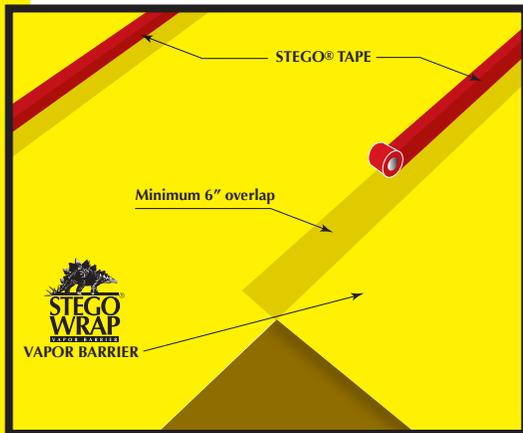
PART 1

STEGO WRAP VAPOR BARRIER/RETARDER INSTALLATION INSTRUCTIONS



IMPORTANT: Please read these installation instructions completely, prior to beginning any Stego Wrap installation. The following installation instructions are based on ASTM E 1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs. If project specifications call for compliance with ASTM E 1643, then be sure to review the specific installation sections outlined in the standard along with the techniques referenced in these instructions.

FIGURE 1: UNDER-SLAB INSTALLATION



UNDER-SLAB INSTRUCTIONS:

1. Stego Wrap can be installed over an aggregate, sand, or tamped earth base. It is not necessary to have a cushion layer or sand base, as Stego Wrap is tough enough to withstand rugged construction environments.
2. Unroll Stego Wrap over the area where the slab is to be placed. Stego Wrap should completely cover the concrete placement area. All joints/seams both lateral and butt should be overlapped a minimum of six inches and taped using Stego Tape.

NOTE: The area of adhesion should be free from dust, dirt, moisture, and frost to allow maximum adhesion of the pressure-sensitive tape.

3. ASTM E 1643 requires sealing the perimeter of the slab. *Extend vapor retarder over footings and seal to foundation wall, grade beam, or slab at an elevation consistent with the top of the slab or terminate at impediments such as waterstops or dowels.* Consult the structural engineer of record before proceeding.

SEAL TO SLAB AT PERIMETER:*

NOTE: Clean the surface of Stego Wrap to ensure that the area of adhesion is free from dust, dirt, moisture, and frost to allow maximum adhesion of the pressure-sensitive adhesive.

- a. Install Crete Claw® on the entire perimeter edge of Stego Wrap.
- b. Prior to the placement of concrete, ensure that the top of Crete Claw is free of dirt, debris, or mud to maximize the bond to the concrete.

STEGO LABOR SAVER!

This method not only complies with ASTM E 1643, but it also:

- reduces labor compared to other perimeter sealing techniques.
- can be used even without an existing wall or footing, unlike alternatives.

FIGURE 2a: SEAL TO SLAB AT PERIMETER

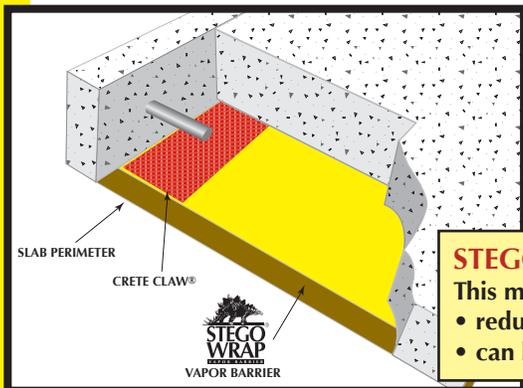


FIGURE 2b: SEAL TO PERIMETER WALL

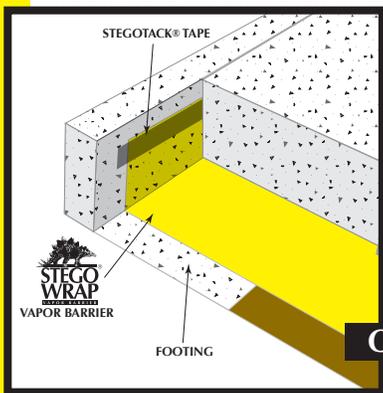
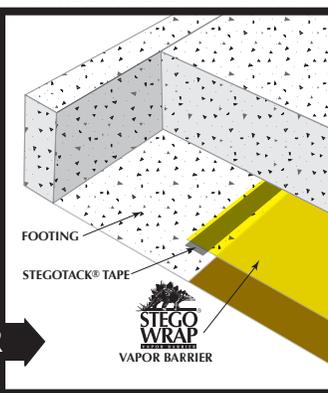


FIGURE 2c: SEAL TO FOOTING



OR SEAL TO PERIMETER WALL OR FOOTING WITH STEGOTACK® TAPE:*

- a. Make sure area of adhesion is free of dust, dirt, debris, moisture, and frost to allow maximum adhesion.
- b. Remove release liner on one side and stick to desired surface.
- c. When ready to apply Stego Wrap, remove the exposed release liner and press Stego Wrap firmly against StegoTack Tape to secure.

* If ASTM E 1643 is specified, consult with project architect and structural engineer to determine which perimeter seal technique should be employed for the project.

NOTE: Stego Industries, LLC's ("Stego") installation instructions are based on ASTM E 1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs. These instructions are meant to be used as a guide, and do not take into account specific job site situations. Consult local building codes and regulations along with the building owner or owner's representative before proceeding. If you have any questions regarding the above mentioned installation instructions or Stego products, please call us at 877-464-7834 for technical assistance. While Stego employees and representatives may provide technical assistance regarding the utility of a specific installation practice or Stego product, they are not authorized to make final design decisions.

- In the event that Stego Wrap is damaged during or after installation, repairs must be made. Stego Tape can be used to repair small holes in the material. For larger holes, cut a piece of Stego Wrap to a size and shape that covers any damage by a minimum overlap of six inches in all directions. Clean all adhesion areas of dust, dirt, moisture, and frost. Tape down all edges using Stego Tape (see figure 3, Sealing Damaged Areas).

FIGURE 3: SEALING DAMAGED AREAS



- IMPORTANT: ALL PENETRATIONS MUST BE SEALED.** All pipe, ducting, rebar, wire penetrations and block outs should be sealed using Stego Wrap, Stego Tape and/or Stego Mastic (see figure 4a, Pipe Penetration Sealing).

FIGURE 4a: PIPE PENETRATION SEALING



STEGO WRAP PIPE PENETRATION REPAIR DETAIL:

- Install Stego Wrap around pipe penetrations by slitting/cutting material as needed. Try to minimize the void space created.
- If Stego Wrap is close to pipe and void space is minimized then seal around pipe penetration with Stego Tape and/or Stego Mastic. **[See Figure 4a]**
- If detail patch is needed to minimize void space around penetration, then cut a detail patch to a size and shape that creates a six inch overlap on all edges around the void space at the base of the pipe. Stego Pre-Cut Pipe Boots are also available to speed up the installation.
- Cut an "X" the size of the pipe diameter in the center of the pipe boot and slide tightly over pipe.
- Tape down all sides of the pipe boot with Stego Tape.
- Seal around the base of the pipe using Stego Tape and/or Stego Mastic. **[See Figure 4b]**

FIGURE 4b: DETAIL PATCH FOR PIPE PENETRATION SEALING

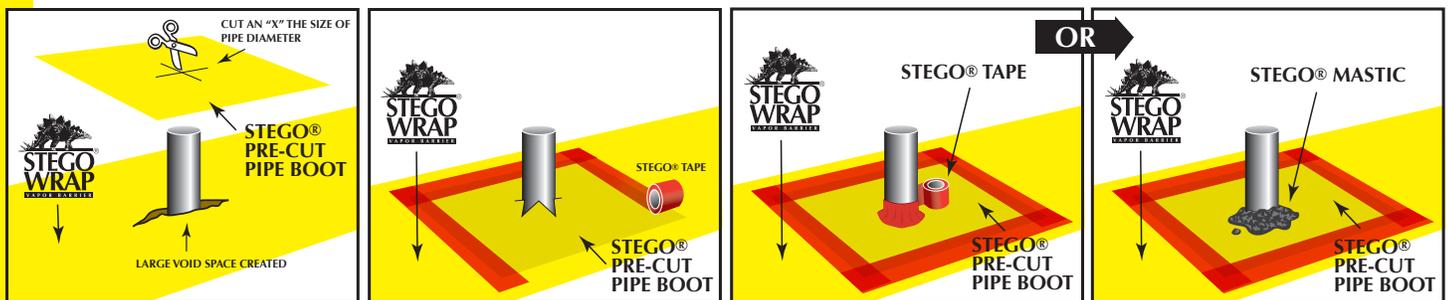


FIGURE 5: MULTIPLE PIPE PENETRATION SEALING



MULTIPLE PIPE PENETRATION SEALING:

Multiple pipe penetrations in close proximity and very small pipes may be sealed using Stego Wrap and Stego Mastic for ease of installation (see figure 5, Multiple Pipe Penetration Sealing).

NOTE: Stego Industries, LLC's ("Stego") installation instructions are based on ASTM E 1643 - *Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs*. These instructions are meant to be used as a guide, and do not take into account specific job site situations. Consult local building codes and regulations along with the building owner or owner's representative before proceeding. If you have any questions regarding the above mentioned installation instructions or Stego products, please call us at 877-464-7834 for technical assistance. While Stego employees and representatives may provide technical assistance regarding the utility of a specific installation practice or Stego product, they are not authorized to make final design decisions.

PART 2

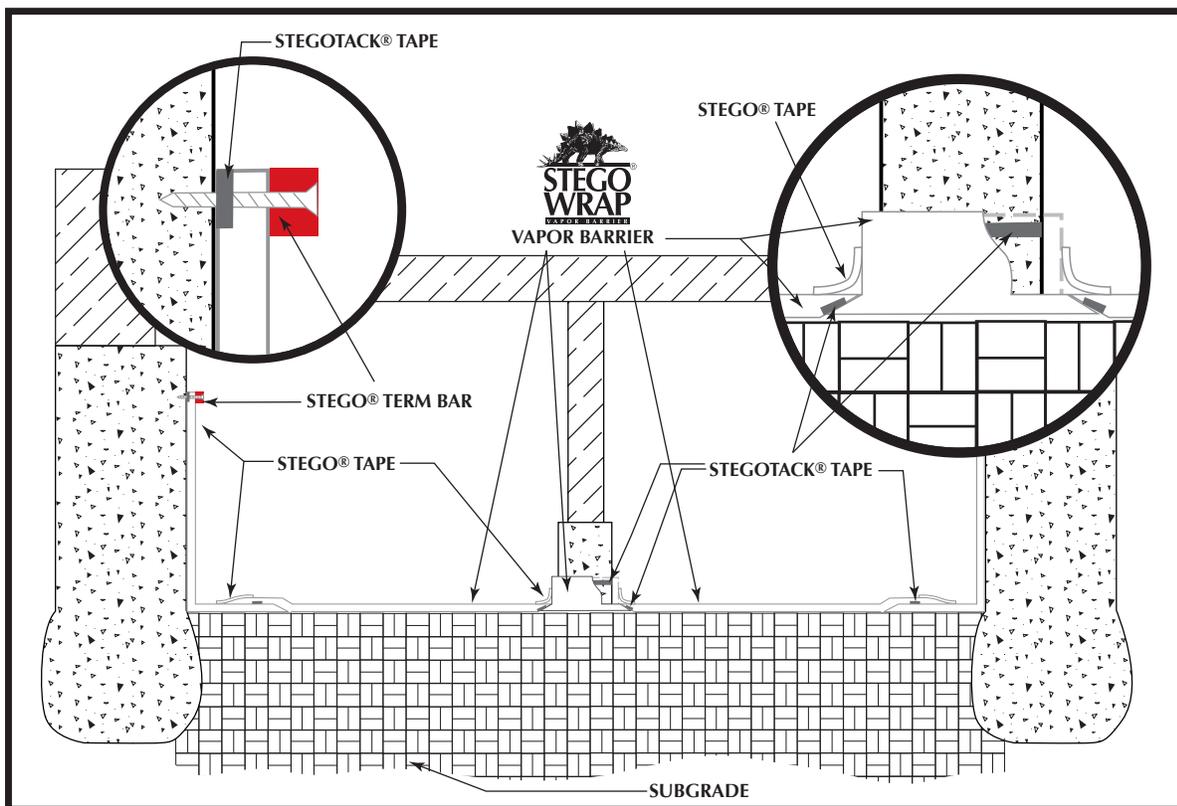
STEGO WRAP VAPOR BARRIER/RETARDER INSTALLATION INSTRUCTIONS



CRAWL SPACE INSTALLATION INSTRUCTIONS:

1. Turn Stego Wrap up the foundation wall to a minimum height of six inches above the outside/exterior grade or in compliance with local building codes and terminate with Stego Term Bar. To form a complete seal, apply StegoTack Tape or a layer of Stego Mastic to the foundation wall prior to installing Stego Term Bar. Allow one hour for Stego Mastic to cure prior to installing Stego Term Bar.
2. Seal Stego Wrap around all penetrations and columns using Stego Tape, StegoTack Tape, and/or Stego Mastic.
3. Place Stego Wrap directly over the crawl space floor. If rigid insulation is to be used, install Stego Wrap prior to insulation (under insulation and between the foundation wall and insulation).
4. Overlap seams a minimum of six inches and seal with Stego Tape. Some codes require a minimum of a twelve inch overlap. Check appropriate codes prior to installation.

FIGURE 6: CRAWL SPACE INSTALLATION



NOTE: Stego Wrap Vapor Barrier and Stego Tape are both available in white (as shown in illustration above).

INSTALLATION TIP:

1. For a cleaner look and to prevent against tenting of Stego Wrap at the foundation wall/foundation floor intersection, consider mechanically fastening Stego Wrap to base of foundation wall in addition to the above mentioned wall termination.

NOTE: Stego Industries, LLC's ("Stego") installation instructions are based on ASTM E 1643 - *Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs*. These instructions are meant to be used as a guide, and do not take into account specific job site situations. Consult local building codes and regulations along with the building owner or owner's representative before proceeding. If you have any questions regarding the above mentioned installation instructions or Stego products, please call us at 877-464-7834 for technical assistance. While Stego employees and representatives may provide technical assistance regarding the utility of a specific installation practice or Stego product, they are not authorized to make final design decisions.

APPENDIX 6

HEALTH AND SAFETY PLAN