
Appendix E: Remedial Action Plan and Construction Health and Safety Plan



Remedial Action Plan

109 East 42nd Street
New York, New York

March 31, 2021

Prepared for:

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1. Introduction

Roux Environmental Engineering and Geology, D.P.C. (Roux), on behalf of Commodore Owner LLC, has prepared this Remedial Action Plan (RAP) to establish the remedial action objectives (RAOs) and procedures to meet these objectives for the proposed redevelopment known as 175 Park (also known as Project Commodore). 175 Park is located at 109 East 42nd Street, which is also identified as Block 1280, Lot 30 on the New York City Tax Map (the “Site”). A Site Location Map is provided in Figure 1. The Site has been assigned CEQR number 21DCP057M by the New York City Department of Environmental Protection (NYCDEP). A Phase I Environmental Site Assessment (ESA) Report was prepared by Roux dated January 13, 2021, and a Phase II ESA Report was prepared by Roux dated February 3, 2021. The results of the Phase I and II ESAs were used to develop this RAP and establish the Remedial Action Objectives (RAOs) provided herein. A Construction Health and Safety Plan (CHASP) has been prepared to accompany this RAP, and it addresses environmental health and safety concerns based on subsurface conditions (Appendix A). This CHASP does not take the place of the Contractor’s own Health and Safety Plan (HASP) for general construction safety.

1.1 Property Location and Site Description

The Site is comprised of a 57,282-square-foot lot that is currently occupied by the Grand Hyatt Hotel, a 26-story building with foundations that penetrate the Metro North Railroad (MNR) and Metropolitan Transit Authority (MTA) mezzanine and platform levels below grade. The “Site” as defined in this RAP is limited to the basement of the current Grand Hyatt Hotel and the below grade structures in the current MNR and MTA space beneath the ground-level of the Grand Hyatt Hotel, which are to be improved with occupiable mechanical spaces (Figures 2A, 2B, 2C and 2D). In addition, foundation elements in the MTA and MNR will be installed as part of this project to support the redevelopment. These foundation elements will be subject to the CHASP and excavation and soil management requirements described within Section 3 of this RAP. There are also several offsite transit improvements including a “Short-Loop” track connection that are being evaluated and may be incorporated into the scope of the redevelopment. If approved, the soil disturbance associated with these improvements is expected to be minimal, and all of this work will be subject to the CHASP and excavation and soil management requirements described within Section 3 of this RAP.

The Site is part of Zoning District C5-3 (Commercial) and located within the Special Midtown District and Grand Central Core District. The Site is bounded by a passage to Grand Central Terminal and a 31-story mixed-use building to the north, the Chrysler Building (Chase Bank/Amazon Store) to the east, the Chanin Building (Apple Bank) to the south, and Park Avenue Elevated Car Viaduct (Banana Republic at Grade below Viaduct) and Grand Central Terminal to the west. Development in the surrounding area is comprised of mixed-use (residential, commercial, school, and community-oriented uses) development.

1.2 Site History

Based on Roux’s review of historical documentation including Sanborn Fire Insurance Maps, historical aerial photographs, historical USGS topographic maps, and the City Directory Abstracts, it appears that the Site was developed prior to 1890 with the Warren Fuller & Co (Manufactory of Paper-Hangings) in the western portion, the “Hospital for the Ruptured and Crippled” (the Hospital) in the southeastern portion and multiple unspecified buildings in the northeastern portion with one structure noted as a wagon building. Between 1890 and 1899, the Hospital in the southeastern portion was noted to expand northward.

The Warren Fuller & Co (Manufactory of Paper-Hangings) was no longer noted to be present at the Site in 1910. All of the buildings on the Site were demolished by 1918, and this demolition debris is a source of some of the fill materials at the Site. In approximately 1919, the entire area of the Site was redeveloped with the 26-story Hotel Commodore. According to the Sanborn Maps, the Hotel Commodore was renovated into the Grand Hyatt Hotel between 1968 and 1980. Although the hotel changed ownership/names, the actual structures do not appear to have changed. Sometime between 1983 and 1985, a restaurant was constructed of glass on the southern portion of the Site and overhangs the sidewalk on East 42nd Street. The Site generally remained consistent with the layout observed in the 1985 Sanborn Map until the most recent 2005 Sanborn Map.

MNR and MTA below-grade railway tunnels, station, and other facilities are present beneath the Site that were constructed in 1910s. In addition, the area surrounding the Site to the west and northwest contains railroad/subway infrastructure including the western adjoining Grand Central Terminal. Other historical uses in the surrounding area consisted of hotels, stores, storage/warehouses, and car/horse storage houses. Around the 1920s, the surrounding area was redeveloped with large-scale, multi-story commercial/office buildings.

1.3 Proposed Site Redevelopment

The planned redevelopment of the Site entails the construction of a new commercial/mixed-use (hotel/offices) tower that will be constructed following the demolition of the Grand Hyatt Hotel. The new tower will have approximately 89 stories. The ground floor of the proposed building will contain the hotel and office lobbies, a reconstructed Lexington Passage with MTA retail, transit hall space, and additional area for subway entries off 42nd Street and Lexington Avenue. Office and hotel space are planned for the upper floors.

In addition, a number of transit and public realm improvements are currently being evaluated and may be incorporated into the overall development. If approved, these changes may include: redesign and expansion of fare control areas, including several new mezzanine stairs; removal of girders from the subway mezzanine level to improve circulation and enhance sightlines; and a “Short-Loop Track” connection that could be constructed to provide direct access for MNR riders from Grand Central Terminal to the subway. Due to the MNR and MTA spaces beneath the current building, the elevation of the proposed building’s foundation slabs are not proposed to be substantially different from those in the current building. Limited and localized excavations will occur to allow for the construction of additional foundation elements that will be used to support the proposed building. No groundwater was observed above bedrock during the completion of the Phase II ESA noted in Section 1.5 below. Based on the anticipated depth to groundwater, dewatering is not anticipated to be required for the proposed construction.

1.4 Topographic and Hydrogeologic Setting

The Site is currently occupied by the Grand Hyatt Hotel, a 26-story building with foundations that penetrate an MTA mezzanine and platform levels below grade. The grade of the Site is generally level. The average elevation of the Site is approximately 49 feet above mean sea level (ft amsl). The Site is not located in or adjacent to any wetlands or located in the 100-year or 500-year flood zones.

During the completion of the test pits performed as part of the Phase II ESA, Roux observed no discernable threshold between historic fill and native soil at each of the test pit locations; historic fill was present in all test pits until refusal. In general, the soil at the Site is comprised of historic fill consisting of fine to coarse

sand, some silt and fine to coarse gravel, with fill consisting of brick, concrete, coal/slag, metal and other building aggregate.

The regional direction of groundwater flow in the vicinity of the Site is assumed to flow towards the east-southeast in the direction of the East River. This estimation was based on regional topographic and hydrogeological features during the Phase I ESA. No groundwater was observed within the overburden materials above bedrock during the Phase II ESA.

1.5 Previous Environmental Reports and Environmental Conditions

The following environmental reports were available for review:

- Phase I ESA, prepared by Roux on behalf of Commodore Owner LLC dated January 2021.
 - Roux identified one Recognized Environmental Condition (REC) during the Phase I ESA.
 - **Mass Transit Usage:** The area upgradient to the northwest of the Site is developed with railroad/subway infrastructure associated with the MNR, including the adjoining Grand Central Terminal. Additional rail structures associated with the MTA are also noted to be present under the Site; therefore, the mass transit/rail usage is considered both onsite and offsite. Railway infrastructure typically involves the usage of various hazardous substances and petroleum products in its operations including lubricants, hydraulic oil, heat resistant oils, brake fluid and other oils used in power generation, which may involve the use of polychlorinated biphenyls (PCBs). Numerous New York State Department of Environmental Conservation (NYSDEC) spill listings are associated with the rail lines in this area.
 - Roux did not identify any Historical RECs (HRECs) or Controlled RECs (CRECs) in connection with the Site. Roux did identify two Business Environmental Risks (BERs).
 - **Suspect Presence of Historic Fill Material:** The Site was historically redeveloped with the Commodore Hotel in 1919 as evidenced by Sanborn Maps and historical accounts and online resources for this time period. The redevelopment would have required demolition of the previous hospital and manufacturing related buildings present in the earlier Sanborn Maps dated 1890, 1899 and 1910. There is potential for the Site to be underlain by Historic Fill Material, which may contain glass, bricks, concrete, slag, ceramic, and other non-native materials brought, deposited or demolished directly into the subsurface to facilitate redevelopment. The presence of this material should be considered when planning any future redevelopment requiring soil/material excavation and disposal.
 - **Suspect Presence of Asbestos Containing Materials (ACMs) in Building Materials:** Based upon the age of construction of the current building (1919), there is potential for ACMs to be present in various pipe wrappings, joint wrappings, and other building materials. The MNR and MTA mezzanine and platform levels below grade were also constructed on or before approximately 1915, with many renovations since initially built, so the potential for ACMs, including pipe insulations, tars, and electrical equipment, extends to these areas as well.
- Phase II ESA, prepared by Roux on behalf of Commodore Owner LLC, dated February 2021.
 - The investigation targeted historic fill below the slab within the specific portions of the building that will require excavation and removal as part of the redevelopment. Roux collected ten soil samples from seven test pits and three samples from three temporary sub-slab soil vapor points. Soil samples collected contained concentrations of semivolatile organic compounds (SVOCs), specifically PAHs, metals, PCBs, and pesticides in exceedance of the New York State Department of Environmental Conservation (NYSDEC) 6 New York Code of Rules and Regulations (NYCRR) Part 375 Unrestricted Use Soil Cleanup Objectives (UUSCOs). Two compounds, benzo(a)pyrene (an SVOC) and lead (a metal) were also detected at

concentrations in exceedance of the Commercial Soil Cleanup Objectives (CSCOs). There was no evidence of gross contamination or petroleum staining/odors. Soil vapor samples collected contained concentrations of volatile organic compounds (VOCs) above laboratory reporting limits at all sampling locations. However, the concentrations of the chlorinated VOCs and petroleum compounds are low and do not indicate that there is an active source of contamination to sub-slab soil vapor. Roux recommended the installation of a vapor barrier as part of the construction of the proposed building as a best practice. Based on the Phase II ESA the Site (soil and soil vapor) appears to have been impacted by contaminants originating from Site operations and historic fill. If excess soils need to be removed from the Site following the installation of foundation elements or future utilities, the soils should be properly managed and disposed of offsite. Future waste characterization sampling will be required in order to ensure that the soils are appropriately handled in accordance with appropriate regulations and requirements of the selected disposal facilities.

- The highest concentrations of lead were observed at two test pits which are both located in the MNR portion of the Site. MNR operations typically involve the usage of various hazardous substances and petroleum products including lubricants, hydraulic oil, heat resistant oils, brake fluid and other oils used in power generation. Electrical power conversion typically involves substations which may involve the use of PCBs in electrical transformers. The two samples, in addition to three other samples, were analyzed for TCLP lead. The results indicate that all soil characterized during this investigation has been determined to be non-hazardous (as compared to standards contained within NYSDEC Part 371 and Title 40 CFR Part 261). Special handling and considerations may be required by disposal facilities based on the elevated concentrations of lead in these two locations.

2. Remedial Action

The following remedial action has been developed for the Site based on the results of the previous Site investigations. Specifically, this plan describes measures to be undertaken during Site redevelopment related to management of excavated soils and fill materials removed from the Site and vapor barrier installation. Upon completion of the Remedial Action, Roux will submit a P.E.-certified Remedial Action Report (RAR) to the NYCDEP detailing the implementation of the remedy.

2.1 Remedial Action Objectives

Based on the results of the Phase II ESA, the following RAOs have been identified for this Site:

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 potential soil vapor.
- Prevent migration of potential soil vapor into dwellings and other occupied structures.

Groundwater

- Groundwater was not encountered in the overburden during the Phase II ESA and no RAOs were identified. Based on the shallow depth to bedrock, the proposed construction will not encounter groundwater, and exposures to groundwater are not anticipated.

2.2 Soil Excavation and Management

Excavation activities during the planned construction program will result in the removal of contaminated soil underlying the Site. Soil excavation and the removal of bedrock will occur in localized excavations within the footprint of the existing basement and in the MNR and MTA spaces (onsite and offsite) to support the construction of various foundation elements as shown on the Hybrid Foundation Plan Progress Prints dated October 21, 2020, which are provided as Appendix B. Soil may also be excavated for installation of utilities beneath the Site. It is not anticipated that excavated soils will be used onsite for backfilling. Crushed rock may be reused beneath foundation elements.

Any remaining excess soil, including the soil/fill generated at the offsite transit and public realm improvement areas, will be excavated and removed from the Site for proper disposal, and a truck log and disposal manifests will be provided in the RAR. Prior to removal, any soil/fill to be sent offsite for disposal will be subject to *in situ* soil characterization sampling to determine appropriate disposal facilities.

2.3 Best Management Practices

As excavation is not planned beneath the entire proposed building footprint, soils with contamination in exceedance of CSCOs will remain onsite following the completion of the Remedial Action. Best Management Practices (BMPs) will be employed in the remedial action to address the residual contamination remaining at the Site. The two primary BMPs that will be used at the Site are:

- Cover system consisting of the new concrete building slab; and
- Soil vapor barrier to separate new building slabs from underlying soil.

2.3.1 Cover System

Exposure to soil with residual impacts at the Site will be prevented by a cover system, which will be constructed as the lowest slab of the proposed building. (Figures 3A and 3B). The cover system is comprised of the concrete foundation slab with a minimum thickness of six inches at the locations shown on Figures 3A and 3B. The areas of the Site where a cover system is not proposed do not have soil beneath the lowest level of the proposed Site building due to the presence of existing MTA or MNR infrastructure (tunnel) air space below.

2.3.2 Soil Vapor Barrier System

Although elevated levels of VOCs were not detected during the Phase II ESA, potential migration of soil vapor into the proposed building will be mitigated with a combination of building slab and vapor barrier as shown on Figure 3A and 3B. The areas of the Site where a soil vapor barrier system is not proposed do not have soil beneath the lowest level of the proposed Site building due to the presence of MTA or MNR infrastructure (tunnel) air space, and therefore, there is not a direct exposure risk to soil vapor.

The subslab soil vapor barrier will be a minimum 20-mil soil vapor barrier made of polyolefin and barrier resins that is ASTM E 1745 Class A, B, and C compliant, resistant to puncturing and has high tensile strength. The permeance of the soil vapor barrier will be compliant with ASTM E 154 Sections 8, 11, 12, and 13. The soil vapor barrier will not deteriorate, decompose, or degrade below concrete slabs when buried and has an indefinite life expectancy. The proposed vapor barrier for under slab applications is either Stego® Wrap 20 Mil Vapor Barrier, Grace Florprufe® or approved equal. Manufacturer's specifications are provided as Appendix C. All soil vapor barriers will be installed in accordance with Manufacturer's recommendations including, but not limited to, recommended overlapping distance, tape seam installation, tape seam products, subbase layer preparation, and material. Appropriate subbase layer will include sand, pea gravel, or mud-slab concrete to prevent punctures during installation. Any penetrations through foundation will be sealed in accordance with the manufacturer's specifications.

The RAR will include photographs (maximum of two photos per page) of the installation process, manufacturer's information on the products installed, and as-built plans showing the soil vapor barrier location.

3. Remedial Soil and Material Management Plan

A Construction Contractor will perform soil excavation activities during the redevelopment process. It will be the responsibility of the Construction Contractor to handle the proper soil management and disposal of all soils excavated from the Site at appropriate offsite disposal facilities. The main elements included in the soil management are described in further detail below.

3.1 Management of Excavated Material

During the course of work at the Site, it is anticipated that excavated material will be sampled *in situ* for waste characterization purposes prior to being excavated and disposed of offsite. The Construction Contractor will coordinate with the disposal facility prior to construction. Procedures to be followed for the temporary stockpiling of fill and/or soil are described below. Observed impacted (visual or olfactory) material will be covered with polyethylene (poly) sheeting with a minimum thickness of 6 mils. These stockpiles will be covered in order to limit precipitation from contacting the material and to avoid the generation of dust. Covered stockpiles will be inspected daily to ensure there has not been any damage to the poly sheeting and the stockpile is still adequately covered.

3.2 Dust Control

Routine dust suppression methods will be employed by the Construction Contractor throughout the construction project. The Construction Contractor will maintain all excavations, stockpiles (if any), access roads/ramps, and all other work areas to minimize dust that would cause a hazard or nuisance to others. The Construction Contractor will implement necessary measures to control particulates including, but not limited to, one or more of the following measures:

1. Applying water on the access roads/ramps;
2. Misting equipment and excavation faces;
3. Spraying water (using atomizer) on buckets during excavation and dumping;
4. Hauling materials in tarped or watertight containers;
5. Reducing speed of vehicles moving through areas of the Site;
6. Covering excavated areas and material after excavation activity ceases; and
7. Stopping work.

The Construction Contractor will make provisions to have an adequate amount of water and appropriate equipment to disperse water onsite at all times.

3.3 Community Air Monitoring Plan

A real-time community air monitoring program (CAMP) will be implemented if contaminated or potentially contaminated media is handled or during any ground intrusive activities. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pit excavation or trenching. The air monitoring is intended to avoid or minimize exposure of the field personnel and the public to potential environmental hazards in the soil during excavation of such soil. Results of this air monitoring will be used to determine the appropriate response action, if needed.

The community air monitoring program described herein has been prepared using the air quality limits specified in the NYSDOH Generic Community Air Monitoring Plan, revision 1 (June 2000), and the NYSDEC Technical and Administrative Guidance Memorandum-4031, Fugitive Dust Suppression and Particulate Monitoring Program (October 27, 1989), and other air monitoring programs previously performed by Roux in New York.

While work zone air monitoring is not described in this RAP, typical air quality limits for the work zone are provided in the CHASP. The Contractor's HASP will need to supplement the CHASP if any additional hazards are anticipated during construction.

3.3.1 VOC Monitoring, Response Levels, and Actions

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 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 will be recorded and be available for NYCDEP personnel to review and summarized in the RAR. Instantaneous readings, if any, used for decision purposes will also be recorded.

3.3.2 Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at 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 ($\mu\text{g}/\text{m}^3$) 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 $150 \mu\text{g}/\text{m}^3$ 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 µg/m³ 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 µg/m³ of the upwind level and in preventing visible dust migration.

All 15-minute readings must be recorded and be available for NYCDEP personnel to review and summarized in the RAR. Instantaneous readings, if any, used for decision purposes will also be recorded.

3.4 Transportation and Disposal of Soils

As discussed above, waste characterization sampling will be completed *in situ* prior to excavation. The Construction Contractor will secure approvals for disposal of fill and soil at a permitted facility in accordance with federal, state, and local regulations. The fill and soil will be shipped by a licensed hauler in accordance with all applicable federal, state, and local regulations. Each shipment will be transported under the appropriate waste manifest/bill of lading or other appropriate documentation based upon pre-characterization results. All disposal documentation will be submitted to Roux and will be included in the RAR. Before any transport vehicle leaves the Site, the sides and wheels will be inspected. If any fill or soils are observed on the wheels or body of the truck, they will be removed using a shovel, broom, and/or other hand tools in a designated vehicle cleaning area. This procedure will reduce the potential for disposal trucks to spread site-derived material onto the public streets.

3.5 Spill Prevention and Control

The following sections describe procedures to be followed to prevent onsite spills and contingency measures in the event that an onsite spill occurs.

3.5.1 General

A major spill is not anticipated at the Site, but the potential for a spill exists. The most probable spill events associated with this scope of work include hydraulic fluid spills from heavy equipment, fuel spills from equipment or machinery, and soils spilled during transportation. Heavy equipment typically contains 30 gallons or less of hydraulic fluid. If a leak occurs, the equipment will immediately be shut down to minimize hydraulic fluid leaks and repaired prior to re-use. The spill will be contained to the extent possible using a bucket and/or oil absorbent pads.

In general, soils spilled during transportation will be collected and returned to the truck for proper disposal. Surfaces impacted as a result of any spill shall be cleaned as soon as possible.

3.5.2 Spill Prevention

In an effort to keep the potential of spills to a minimum and maintain a constant state of readiness to combat a spill or release, the following inspections will be performed by the Site Health and Safety Officer (SHSO):

- Onsite Materials Handling – Used to account for material (including fill) quantity and proper methods of storage to help reduce the chance of a spill or release.
- Safety Equipment Inspections – Used to account for the quantity, location, and working condition of safety equipment onsite. Safety equipment and supplies will be kept accessible and in good working order.

Any discrepancies or inadequacies discovered as a result of these inspections will be corrected immediately.

3.5.3 Spill Response

Should a spill of any type occur, it will be immediately reported to the Construction Contractor's designated onsite spill response personnel. The Construction Contractor will then notify the Owner's Representative and Construction Manager, who will then contact the appropriate regulatory agencies. Potential spills for this project are anticipated to be secured and cleaned up by Site personnel who are trained in spill response, where appropriate. Unauthorized personnel will be prohibited from entering all spill cleanup areas. The Site Superintendent or Site Safety Officer must evaluate the extent of the hazard(s) and, if available, utilize engineering controls and proper safety equipment to contain the spill until the appropriate emergency response personnel arrive onsite, if necessary.

The following is a list of actions that should be taken in the event of a spill:

- Account for Site personnel and make proper notifications.
- Evaluate the hazard(s), identify the source of the discharge, and stop the spill or leak.
- Exclude any source of ignition from the spilled material if flammable.
- Isolate and contain the spill in the smallest area possible.
- Keep personnel upwind of the spill area. Evaluate potential vapor and dust hazards, and implement appropriate suppression operations.
- At no time will personnel be allowed to come in contact with unidentified spilled materials.
- Notify the Owner's Representative and Construction Manager.

The spill control equipment will be located in a construction trailer or office located at or near the Site. The exact location of the trailer or office has not yet been determined. The spill control equipment will consist of buckets, absorbent pads, oil dry, and sand.

If there is a spill offsite on the public roadway, it is the responsibility of the Waste Transportation Contractor to notify the proper authorities. Vehicles transporting materials offsite will have 24-hour emergency contact information included on the Waste Manifest/Bill of Lading. In the case of an offsite spill, the transporter will immediately notify their designated spill response Construction Contractor and the Owner's Representative and Construction Manager.

3.6 Vehicle Cleaning Area/Stabilized Construction Entrances

One or more temporary vehicle cleaning areas/stabilized construction entrances will be constructed to clean disposal trucks and other vehicles prior to leaving the Site. This area will reduce the amount of fill and soil that disposal trucks and other vehicles spread onto the public roadway. The vehicle cleaning area/stabilized construction entrance will be constructed of gravel and will be of sufficient size to prevent vehicles from spreading fill/soils onto the public roads and/or previously excavated areas of the Site where all fill has been removed. Before any disposal truck or other vehicle leaves the Site, the sides and wheels will be inspected. If any fill or soils are observed on the wheels or body of the truck, they will be removed using a shovel, broom, and/or other hand tools in the designated vehicle cleaning area. This will reduce the potential for disposal trucks to spread Site-derived material onto the public streets.

3.7 Personnel and Equipment Cleaning Areas

All personnel working in the fill will clean themselves prior to leaving the Site in accordance with the CHASP prepared for the Site. In addition, all equipment used for excavation and other earthwork activities (i.e., excavators, bulldozers, backhoes, etc.), which comes in contact with the fill, shall be cleaned at the vehicle cleaning area prior to:

- a. Crossing into areas of the Site where no fill is present;
- b. Handling clean fill/topsoil; and
- c. Leaving the Site.

No equipment will be allowed to leave the Site prior to the SHSO or Site superintendent's verification that the equipment was properly cleaned.

3.8 Unexpected Conditions

Based upon investigation data, much of the Site consists of historical fill material. Fill material contains brick, concrete, coal/slag, metal and other building aggregate. When fill material, as described above, is encountered during excavation activities, it will not be considered an "unexpected condition."

Screening for "unexpected conditions" will be performed by the Construction Contractor, with oversight by Roux personnel, during all excavation and other earth moving activities (not including the activities related to "clean" fill brought onsite). This screening will include the following:

1. Visual inspection for evidence of grossly contaminated soil (i.e., visibly identifiable free-phase or otherwise readily detectable free-phase or residual product.); and
2. Periodically screening for organic vapors with a PID.

The following procedures will be followed if "unexpected conditions" are encountered. The material encountered will be:

1. Excavated within the limits of the proposed excavation;
2. Stockpiled separately from other materials in accordance with the temporary stockpiling requirements outlined above;
3. Sampled for waste characterization parameters for disposal purposes; and
4. Disposed of appropriately offsite.

If intact or damaged buried drums or suspect asbestos containing materials (ACM) are encountered, the Construction Contractor will notify the Owner's Representative and Construction Manager who will contact the proper regulatory agencies.

In general, the Construction Contractor will be responsible for notifying the Owner's Representative and Construction Manager who will then notify the NYCDEP, and any other applicable regulatory agency of the "unexpected conditions" encountered. If encountered, any previously unidentified tanks and associated appurtenances, drums, and/or petroleum-impacted soils will be properly removed in accordance with all applicable regulations after following the above-mentioned procedures. All equipment used will be cleaned in accordance with the appropriate vehicle/equipment cleaning procedures.

3.9 Underground Storage Tanks

It is not expected that any underground storage tanks (USTs) are present beneath the Site. However, if any USTs encountered during demolition and construction activities must be properly closed and/or removed in accordance with local, state, and federal laws. The following protocols will be followed in case a UST is found during excavation:

- Excavation work will cease until such time that an inspection of the UST is conducted to determine the nature of its contents.
- If the UST is found to contain fluid, arrangements will be made to sample the contents, evacuate the contents, and properly dispose of the contents based on the analytical results and in accordance with applicable regulations.
- If required, the UST will be registered with the NYSDEC, who will be given 30-days advanced notice of its scheduled removal.
- The UST will be excavated, and its atmosphere evacuated. It will be rendered un-usable and properly disposed of.
- Endpoint soil samples will be collected from the tank excavation in accordance with the NYSDEC Spill Technology and Remediation Series (STARS) Memo #1 Petroleum-Contaminated Soil Guidance Policy. Once it is confirmed that the remaining soil meets the standards set forth in the CP-51: Soil Cleanup Guidance, development in the area of the former UST may proceed.
- A report will be prepared and submitted to the NYSDEC requesting closure of the UST and potential spill number.

Note that depending on the results of the endpoint samples, an additional investigation or remediation may be required by the NYSDEC or NYCDEP.

3.10 Procedures for Imported Fill

Any imported fill should come from an approved source. The clean fill will be segregated at the source/facility and samples will be collected by qualified environmental personnel. This clean fill will not be comprised of any construction and/or demolition debris originating from the Site. Clean fill samples will be collected and analyzed at a frequency in compliance with Part 360 regulations by a New York State Department of Health (NYSDOH) Environmental Laboratories Accreditation Program (ELAP) certified laboratory. This frequency may be modified based on quantity of import. The results will be reviewed by Roux to ensure that the samples meet the CSCOs. Gravel, rock or stone consisting of virgin material from a permitted mine or quarry or recycled concrete or brick from a NYSDEC registered construction and demolition debris processing facility if the material conforms to the requirements of Section 304 of the New York State Department of Transportation Standard Specifications Construction and Materials Volume 1 (2002) may be imported, without chemical testing, to be used as backfill beneath pavement, buildings or as part of the final site cover, provided that it contains less than 10% by weight material which would pass through a size 80 sieve.

Respectfully submitted,

ROUX ENVIRONMENTAL ENGINEERING AND GEOLOGY, D.P.C.



Charlie McGuckin, P.E.
Principal Engineer



Frank Cherena, P.G.
Principal Hydrogeologist

FIGURES

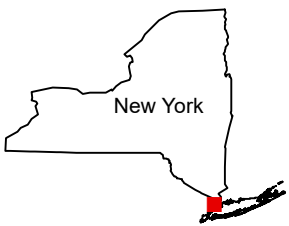
1. Site Location Map
- 2A. Site Boundary – Sub-Cellar 2
- 2B. Site Boundary – Sub-Cellar 1
- 2C. Site Boundary – Cellar
- 2D. Site Boundary – Ground Floor
- 3A. Proposed Cover System – Sub-Cellar 2
- 3B. Proposed Cover System – Cellar



SITE →

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QUADRANGLE LOCATION



Title:

SITE LOCATION MAP

109 EAST 42ND STREET
NEW YORK, NY

Prepared for:

COMMODORE OWNER LLC



Compiled by: R.H.	Date: 01/15/21	FIGURE 1
Prepared by: M.S.R.	Scale: AS SHOWN	
Project Mgr: R.H.	Project: 3255.0002Y000	
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L 20'-0"
K 20'-0"
J 20'-0"
H 20'-0"
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D 20'-0"
C 20'-0"
B 20'-0"
A 20'-0"



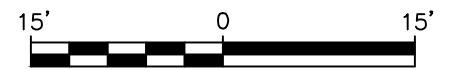
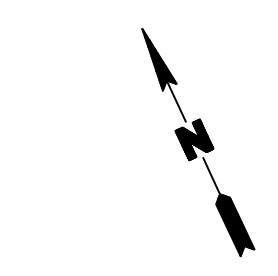
LEGEND

— SUB-CELLAR 2 SITE BOUNDARY

— LOT BOUNDARY

NOTES

- SUB-CELLAR 2 IS THE LOWEST LEVEL OF THE PROPOSED REDEVELOPMENT.
- BASE DRAWING IS FROM SKIDMORE, OWINGS & MERRILL LLP'S SCHEMATIC DESIGN PLANS DATED OCTOBER 2, 2020.



Title:			
SITE BOUNDARY - SUB-CELLAR 2			
109 E 42ND STREET NEW YORK, NEW YORK			
Prepared for:			
COMMODORE OWNER LLC			
ROUX	Compiled by: R.H.	Date: 12MAR21	FIGURE 2A
	Prepared by: B.H.C.	Scale: AS SHOWN	
	Project Mgr: R.H.	Project: 3255.0002Y000	
	File: 3255.0002Y108.01.DWG		

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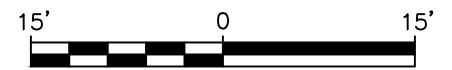
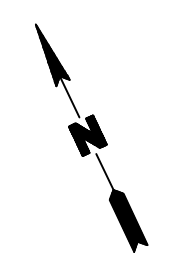
LEGEND


— SUB-CELLAR 1 SITE BOUNDARY

— LOT BOUNDARY

NOTE

1. BASE DRAWING IS FROM SKIDMORE, OWINGS & MERRILL LLP'S SCHEMATIC DESIGN PLANS DATED OCTOBER 2, 2020.



Title:			
SITE BOUNDARY - SUB-CELLAR 1			
109 E 42ND STREET NEW YORK, NEW YORK			
Prepared for:			
COMMODORE OWNER LLC			
Compiled by: R.H.	Date: 12MAR21		FIGURE
Prepared by: B.H.C.	Scale: AS SHOWN		2B
Project Mgr: R.H.	Project: 3255.0002Y000		
File: 3255.0002Y108.01.DWG			

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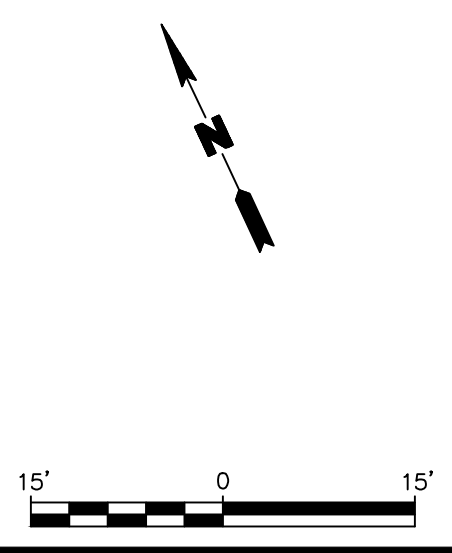
LEGEND

— CELLAR SITE BOUNDARY

— LOT BOUNDARY

NOTE

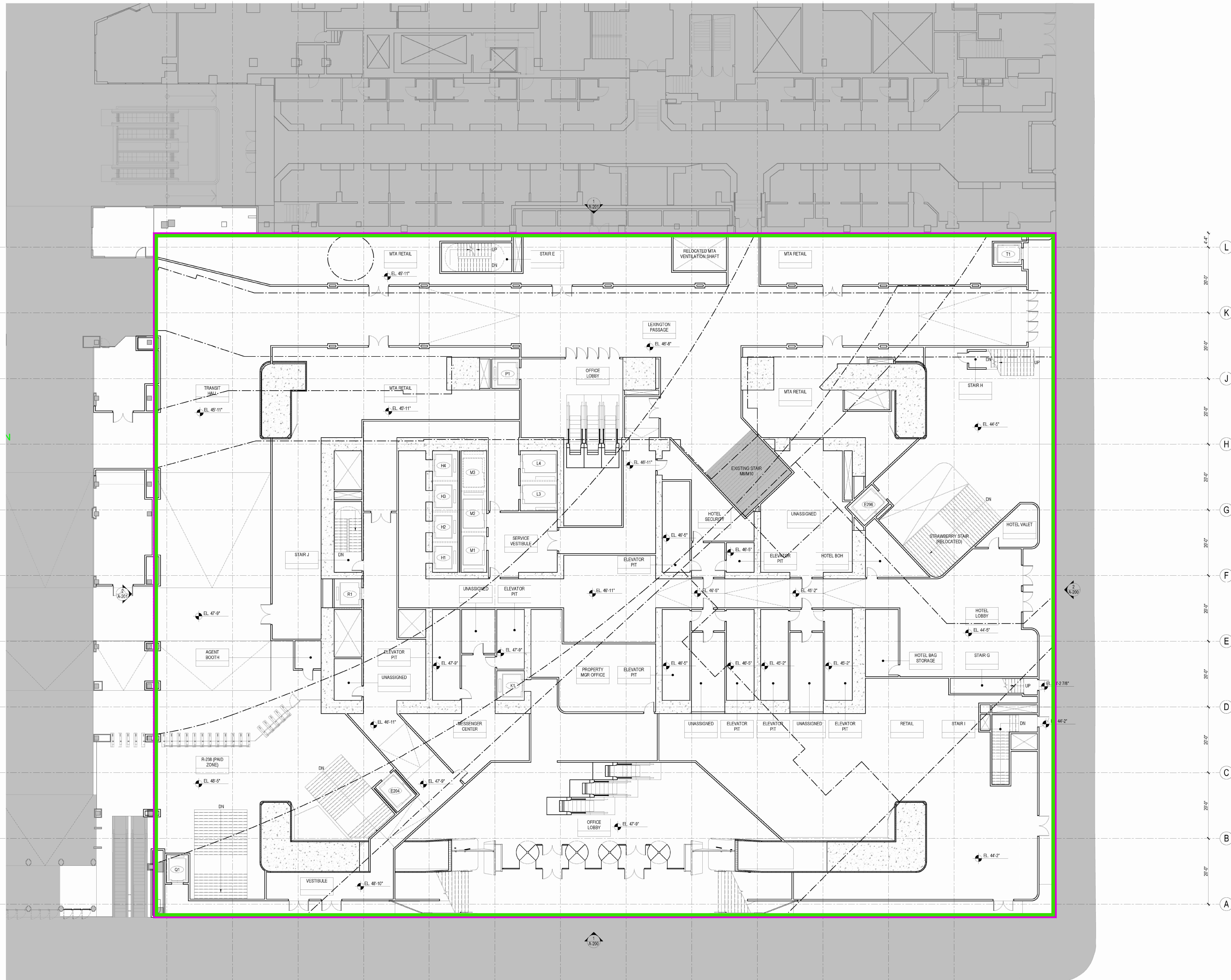
1. BASE DRAWING IS FROM SKIDMORE, OWINGS & MERRILL LLP'S SCHEMATIC DESIGN PLANS DATED OCTOBER 2, 2020.



Title:			
SITE BOUNDARY - CELLAR			
109 E 42ND STREET NEW YORK, NEW YORK			
Prepared for:			
COMMODORE OWNER LLC			
	Compiled by: R.H.	Date: 12MAR21	FIGURE 2C
	Prepared by: B.H.C.	Scale: AS SHOWN	
	Project Mgr: R.H.	Project: 3255.0002Y000	
	File: 3255.0002Y108.01.DWG		

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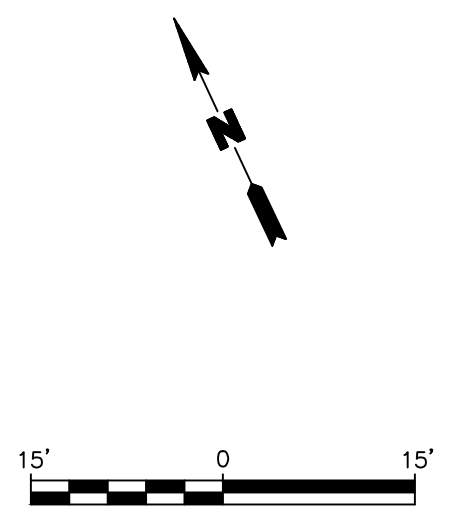


LEGEND

- GROUND FLOOR SITE BOUNDARY
- LOT BOUNDARY

NOTE

1. BASE DRAWING IS FROM SKIDMORE, OWINGS & MERRILL LLP'S SCHEMATIC DESIGN PLANS DATED OCTOBER 2, 2020.



SITE BOUNDARY - GROUND FLOOR			
109 E 42ND STREET NEW YORK, NEW YORK			
Prepared for: COMMODORE OWNER LLC			
ROUX	Compiled by: R.H.	Date: 03MAR21	FIGURE
	Prepared by: B.H.C.	Scale: AS SHOWN	2D
	Project Mgr: R.H.	Project: 3255.0002Y000	
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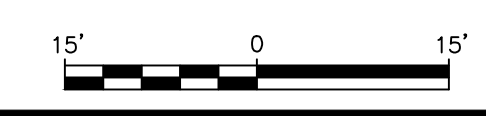
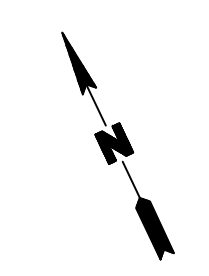


LEGEND

- SUB-CELLAR 2 SITE BOUNDARY
- LOT BOUNDARY
- PROPOSED COVER SYSTEM COMPRISED OF CONCRETE BUILDING SLAB/FOUNDATION
- XXXX PROPOSED VAPOR BARRIER

NOTES

1. SUB-CELLAR 2 IS THE LOWEST LEVEL OF THE PROPOSED REDEVELOPMENT.
2. BASE DRAWING IS FROM SKIDMORE, OWINGS & MERRILL LLP'S SCHEMATIC DESIGN PLANS DATED OCTOBER 2, 2020.



PROPOSED COVER SYSTEM SUB-CELLAR 2			
109 E 42ND STREET NEW YORK, NEW YORK			
Prepared for: COMMODORE OWNER LLC			
ROUX	Compiled by: R.H.	Date: 12MAR21	FIGURE
	Prepared by: B.H.C.	Scale: AS SHOWN	3A
	Project Mgr: R.H.	Project: 3255.0002Y000	
	File: 3255.0002Y108.01.DWG		

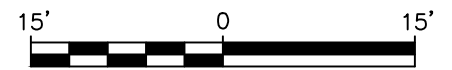
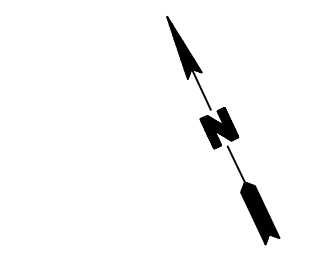
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14 13 12 11 10 9 8 7 6 5 4 3 2 1



- LEGEND**
- SUB-CELLAR 2 SITE BOUNDARY
 - LOT BOUNDARY
 - PROPOSED COVER SYSTEM COMPRISED OF CONCRETE BUILDING SLAB/FOUNDATION
 - ▨ PROPOSED VAPOR BARRIER

- NOTES**
1. SUB-CELLAR 2 IS THE LOWEST LEVEL OF THE PROPOSED REDEVELOPMENT.
 2. BASE DRAWING IS FROM SKIDMORE, OWINGS & MERRILL LLP'S SCHEMATIC DESIGN PLANS DATED OCTOBER 2, 2020.



PROPOSED COVER SYSTEM CELLAR			
109 E 42ND STREET NEW YORK, NEW YORK			
Prepared for: COMMODORE OWNER LLC			
ROUX	Compiled by: R.H. Project Mgr: R.H.	Date: 12MAR21 Scale: AS SHOWN Project: 3255.0002Y000	FIGURE 3B
		File: 3255.0002Y108.01.DWG	

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APPENDICES

- A. Construction Health and Safety Plan
- B. Hybrid Foundation Plan Progress Prints
- C. Vapor Barrier Specifications

Construction Health and Safety Plan



Construction Health and Safety Plan

109 East 42nd Street
New York, New York

March 5, 2021

Prepared for:

Commodore Owner LLC
75 Rockefeller Plaza
Suite 1500
New York, New York 10019

Prepared by:

**Roux Environmental Engineering
and Geology, D.P.C.**
209 Shafter Street
Islandia, New York 11749

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1. Introduction

This site-specific Construction Health and Safety Plan (CHASP) has been prepared to address remediation activities to be performed during excavation and construction for the proposed development known as 175 Park (also known as Project Commodore). 175 Park is located at 109 East 42nd Street, which is also identified as Block 1280, Lot 30 on the New York City Tax Map (the "Site"). Relevant portions of Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 and 1926.65 were used as guidance while preparing this CHASP. This CHASP has been prepared to accompany a Remedial Action Plan (RAP) to be implemented at the Site and addresses environmental health and safety concerns based on subsurface conditions.

This CHASP has been prepared to accompany the Site's Remedial Action Plan (RAP), dated March 5, 2021, and it addresses environmental health and safety concerns based on subsurface conditions. This CHASP does not take the place of the Construction Manager's own Health and Safety Plan (CHASP) for general construction safety.

The designated Site Health and Safety Officer (SHSO) will be responsible for implementing the CHASP. Compliance with this CHASP is required of all workers who may potentially encounter soil at the Site (hereinafter referred to as Site Workers), including the Contractor's employees, subcontractors to the Contractor, subcontractors to the Owner's representative, and onsite workers for the Construction Manager. In the event that a Site Worker does not follow the procedures outlined in the CHASP, he or she will be required to leave the Site immediately. The content of this CHASP may change or undergo revisions based upon changes in the technical scope of work, the results of monitoring, and/or additional information made available to health and safety personnel. Any proposed changes must be reviewed and approved by the Corporate Safety Supervisor, and the SHSO implementing the changes to the CHASP. As of the date of this CHASP the Contractor has not been selected; the name and contact information for the Contractor will be added to the CHASP once selected.

Upon entering the Site, all visitors will be required to sign in and read and comply with the provisions of this CHASP. In the event that a visitor does not follow these procedures, he or she will be required to leave the Site immediately.

1.1 Scope of Work

This CHASP addresses excavation and construction of a new 89-story commercial/mixed-use tower that will be constructed following the demolition of the Grand Hyatt Hotel. The ground floor of the proposed building will contain the hotel and office lobbies, a reconstructed Lexington Passage with MTA retail, 6,350 square feet of transit hall space, and approximately 2,400 square feet of additional area for subway entries off 42nd Street and Lexington Avenue. An office lobby and open-air publicly accessible space will occupy the second floor with frontage on Lexington Avenue. Office space is planned to be located on floors 7 through 63, and the hotel is scheduled to occupy floors 65 through 83.

1.2 Emergency and Project Management Contact Information

Provided below is a list of telephone numbers for use in the event of an emergency onsite.

Emergency Medical Service	911
<u>Police</u> : New York City Police Department (NYPD)	911
<u>Hospital</u> : Bellevue Hospital	(212) 562-4141
<u>Urgent Care</u> : CityMD	(212) 729-4668
National Response Center	(800) 424-8802
Poison Control Center	(800) 222-1222
Chemtrec	(800) 262-8200
<u>Fire</u> : New York City Fire Department (FDNY)	911
New York City Office of Emergency Management	911
Center for Disease Control	(800) 311-3435
USEPA (Region II)	(212) 637-5000
NYSDEC Emergency Spill Response	(800) 457-7362

The following table includes the contact information for Site management and health and safety personnel.

Title	Contact	Company Name	Business Phone	Mobile Phone
General/Site Superintendent	TBD	TBD	TBD	TBD
Corporate Safety Supervisor				
Site Health and Safety Officer	TBD	TBD	TBD	TBD
Construction Manager	TBD	TBD	TBD	TBD
Environmental Consultant	Frank Cherena, P.G	Roux Environmental Engineering and Geology, D.P.C.	(631) 232-2600	(631) 445- 0357
Owner's Onsite Representative	TBD	TBD	TBD	TBD
Owner's Representative	Gregory Lowe	Commodore Owner LLC	(917) 282-9864	TBD

1.3 Address of Hospital and Urgent Care

The following information is for hospital and urgent care locations. A map and directions to each facility is provided in Figure 1.

Bellevue Hospital

462 1st Avenue
New York, New York 10016

CityMD

561 3rd Avenue
New York, New York 10016

1.4 Emergency Equipment

The following is a list of emergency equipment to be kept onsite at all times:

- First Aid Kit;
- ABC Fire Extinguisher;
- Absorbent Pads;
- Air Horns;
- Oil Dry; and
- Eye Wash.

1.5 Spills

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

2. Health and Safety Staff

This section briefly describes the health and safety responsibilities for the excavation work to be implemented at the Site. The following staff is responsible for ensuring compliance with the CHASP.

2.1 General/Site Superintendent (GSS) – TBD

- Has the overall responsibility for the health and safety of Site Workers.
- Ensures that adequate resources are provided to the field health and safety staff to carry out their responsibilities as outlined below.

2.2 Corporate Safety Supervisor (CSS) – TBD

- Implements the CHASP.
- Performs or oversees Site-specific training and approves revised or new safety protocols or field operations.
- Coordinates revisions of this CHASP with GSS.
- Responsible for the development of new task safety protocols and procedures and resolution of any outstanding safety issues which may arise during the completion of Site work.
- If the Contractor does not have a CSS, all CSS duties should be assumed by the SHSO.

2.3 Site Health and Safety Officer (SHSO) – TBD

- Directs and coordinates health and safety monitoring activities.
- Ensures that field teams utilize proper personal protective equipment (PPE).
- Conducts initial onsite specific training prior to Site Workers commencing work.
- Conducts and documents daily and periodic safety briefings.
- Ensures that field team members comply with this CHASP.
- Immediately notifies the GSS and CSS of all accident/incidents.
- At the end of each day, communicates the tasks completed to the designated representatives, the next day's planned activities, any third-party issues, changes of work plans, and/or changes in level of PPE.
- Determines upgrading or downgrading of PPE based on Site conditions and/or real time monitoring results.
- Ensures that monitoring instruments are calibrated daily or as the manufacturer's instructions determine.
- Reports to the GSS and CSS to provide summaries of field operations and progress.
- Submits and maintains all documentation required in this CHASP and any other pertinent health and safety documentation.

2.4 Site Workers

- Reports any unsafe or potentially hazardous conditions to the SHSO.
- Maintains knowledge of the information, instructions, and emergency response actions contained in the CHASP.
- Complies with rules, regulations, and procedures as set forth in this CHASP, including any revisions that are instituted.
- Prevents admittance to work Site by unauthorized personnel.

3. Site Description and Background

This section provides a brief summary of the conditions of the Site.

3.1 Site Description

The Site is comprised of a 57,282-square-foot lot that is currently occupied by the Grand Hyatt Hotel, a 26-story building with foundations that penetrate the Metro North Railroad (MNR) and MTA mezzanine and platform levels below grade.

3.2 Summary of Environmental Conditions

In January 2021, Roux performed a Phase I Environmental Site Assessment (ESA) on behalf of Commodore Owner LLC. Roux identified one recognized environmental condition (REC), mass transit usage. Roux also identified two Business Environmental Risks (BERs): 1) suspected presence of historic fill materials and 2) suspected presence of Asbestos Containing Materials (ACMs).

Following the Phase I ESA, Roux completed a Phase II ESA to investigate the REC identified at the Site to the extent that it may impact the future development. Roux collected ten soil samples from seven test pits and three samples from three temporary sub-slab soil vapor points.

Soil samples collected contained concentrations of semivolatile organic compounds (SVOCs), specifically polycyclic aromatic hydrocarbons (PAHs), metals, polychlorinated biphenyls (PCBs), and pesticides in exceedance of the New York State Department of Environmental Conservation (NYSDEC) 6 New York Code of Rules and Regulations (NYCRR) Part 375 Unrestricted Use Soil Cleanup Objectives (UUSCOs) and/or Commercial Soil Cleanup Objectives (CSCO). The highest concentrations of lead were observed at two test pits which are both located in the MNR portion of the Site. The two samples, in addition to three other samples, were analyzed for toxicity characteristic leaching procedure (TCLP) lead and all soil onsite was determined not to be hazardous for disposal purposes.

Soil vapor samples collected contained concentrations of volatile organic compounds (VOCs) above laboratory reporting limits at all sampling locations. However, the concentrations of the chlorinated-related and petroleum compounds are low and do not indicate that there is an active source of contamination to sub-slab soil vapor. Roux recommended the installation of a vapor barrier as part of the construction of the proposed building as a best management practice.

Based on the Phase II ESA, the Site's soil appears to have been impacted by contaminants originating from prior Site operations and historic fill. Excess soils will need to be removed from the Site following the installation of foundation elements or future utilities, and these soils should be properly managed and disposed of offsite. Waste characterization sampling will be required in order to ensure that the soils are appropriately handled in accordance with appropriate regulations and requirements of the selected disposal facilities.

4. Potential Hazards Related to Fill/Soil

This section provides a brief summary of the potential Compounds of Concern and related hazards at the Site. The toxicological, physical, and chemical properties of potential contaminants are presented in Table 1.

4.1 General

The following information is presented in order to identify the types of materials that may be encountered at the Site. The detailed information on these materials was obtained from:

- SAX's Dangerous Properties of Industrial Materials – Lewis Eight Edition
- Chemical Hazards of the Workplace – Proctor/Hughes
- Condensed Chemical Dictionary – Hawley
- Rapid Guide to Hazardous Chemical in the Workplace – Lewis 1990
- NIOSH Pocket Guide to Chemical Hazards
- ACGIH Threshold Limit Values (TLV) and Biological Exposure Indices (BEI)
- OSHA 29 CFR 1910.1000

Several chemicals that may potentially be present in soils at the Site, based on previous sampling results have been identified. The Summary of Toxicological Data is found in Table 1 and is provided for review of chemicals that may be encountered. The Summary of Toxicological Data Sheets provides information such as the chemicals characteristics, health hazards, protection, and exposure limits.

4.2 Compounds of Concern

Based on the results of Roux's Phase II ESA, soil samples collected contained concentrations of SVOCs, specifically PAHs, metals, PCBs, and pesticides in exceedance of the NYSDEC 6 NYCRR Part 375 UUSCOs and/or CSCOs.

4.3 Hazard Assessment

The potential to encounter hazards related to surficial soil is dependent upon the type of work activity performed and the duration and location of the work activity. Such hazards could include ingestion, inhalation, and/or skin contact with chemicals that could cause: dermatitis, skin burns, or asphyxiation.

Physical hazards that may be encountered during Site work include; heat and cold stress, exposure to excessive noise, loss of limbs, being crushed, head injuries, punctures, cuts, falls, electrocution, bruises, structural integrity of buildings, asbestos and lead paint exposure, and other physical hazards due to motor vehicle operation, heavy equipment, and power tools. The potential for Site Workers to be exposed to chemical hazards may occur during excavation, soil handling, foundation work, and truck and equipment cleaning activities.

Biological hazards may exist during Site activities. These hazards include exposure to insect bites/stings, animals and animal wastes, mold and blood borne pathogens.

Prior to the beginning of each new phase of work, an activity hazard analysis will be prepared by the SHSO with assistance from the GSS/CSS. The analysis will address the hazards for each activity performed in the phase and will present the procedures and safeguards necessary to eliminate the hazards or reduce the risk.

4.4 Exposure Pathways and Assessment

Exposure to these compounds during ongoing activities may occur through inhalation of dust particles and by way of dermal absorption and accidental ingestion by either direct or indirect cross-contamination activities.

Inhalation of dust particles can occur during adverse weather conditions (high or changing wind directions) or during operations that may generate airborne dust such as excavation and loading of Fill or Site grading. Dust control measures such as applying water to roadways and excavations will be implemented when visible dust is generated. Where dust control measures are not feasible or effective, respiratory protection will be used (see Section 7.0 for monitoring procedures and action levels).

4.5 Additional Precautions

Inhalation and dermal absorption contact with ACM and lead-based paint materials is possible during demolition activities at the Site. In addition, dermal absorption or skin contact with Site soils is possible during intrusive activities. The use of PPE and proper vehicle and Site Worker cleaning procedures should significantly reduce the risk of skin contact. The potential for accidental ingestion of Site soils is expected to be remote when good hygiene practices are used.

4.6 Hazard Assessment and Mitigation

Task	Hazards	Risk of Exposure	Action Taken
Mobilization/Demobilization	Inhalation/ Skin Contact	Low	Proper PPE will be worn. No eating or drinking will be permitted in active work areas.
Site Building Demolition	Inhalation/Skin Contact	Low	Proper PPE will be worn. No eating or drinking will be permitted in active work areas.
Excavation and Loading of Soil	Inhalation/ Skin Contact	High	Proper PPE will be worn, and Site Workers will remain upwind of excavation or loading areas, if possible. No eating or drinking will be permitted in active work areas.
Vehicle/Equipment Cleaning	Inhalation/ Skin Contact	Low	Proper PPE will be worn during vehicle cleaning and worker shall remain upwind, if possible. No eating or drinking will be permitted in active work areas.

5. Training

This section details the training requirement for Site Workers.

5.1 Site-Specific Training

Prior to the commencement of field activities, the SHSO, CSS, or GSS will provide Site-specific training to all Site Workers. Site Workers will receive training that will specifically address the activities, procedures, monitoring, and equipment for Site operations. It will include Site layout, hazards, fire prevention and response, first aid equipment locations and emergency services at the Site and will highlight all provisions contained within this CHASP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity. This training may be conducted in conjunction with other Site training or meetings.

5.2 Onsite Safety Meetings

Safety meetings will take place to discuss potential safety concerns for the upcoming activities. At a minimum, the appropriate field supervisors or foremen for all workers will conduct at least one formal daily safety meeting in the morning; however, additional meetings or briefings may be necessary as a result of changing conditions or modifying tasks. Copies of the daily safety meeting sign in sheet and a description of items discussed will be provided to the GSS and will be kept at the Site.

The meetings will also provide a forum to facilitate conformance with safety requirements and to identify performance deficiencies related to safety during daily activities or as a result of safety audits by the Contractor or other involved parties. These meetings may be conducted in conjunction with other Site training or meetings.

Visitors onsite must be made aware of the hazards onsite in a Site-specific safety briefing and sign a statement indicating that they will comply with the applicable requirements of this CHASP.

5.3 First Aid and CPR

The SHSO will identify those individuals having first aid and CPR training to assist with emergency medical treatment during field activities, if necessary. The training will be consistent with the requirements of the American Red Cross. Certification and appropriate training documentation will be kept with the Site Workers' records by the SHSO.

6. Site Control and Personal Protective Equipment

This section provides a detailed description of the Site control measures and personal PPE procedures to be implemented at the Site. It is important to note that this CHASP has been drafted to apply to work in Level D or modified Level D only. If the monitoring results require Level C protection or higher, all Site work will immediately cease until activities can be completed with workers trained in accordance with 29 CFR 1910.120.

6.1 Site Control

Based on the Site history and the results of Roux's investigations, SVOCs, specifically PAHs, metals, PCBs, and pesticides have been identified onsite in exceedance of the NYSDEC 6 NYCRR Part 375 UUSCOs and/or CSCOs. As such, the Site from land surface down to the bedrock will be considered the work area with respect to this CHASP.

6.2 Personal Protective Equipment

The level of protection worn by Site Workers will be enforced by the SHSO. The level of protection may be upgraded at the discretion of the SHSO. All decisions on the level of protection will be based upon a conservative interpretation by the SHSO of the information provided by air monitoring results and/or other appropriate information. Any changes in the level of protection shall be recorded in the health and safety field logbook. If the level of respiratory protection needs to be upgraded, the Contractor will immediately contact the Construction Manager and Owner's Representative.

The level of PPE for work on the Site is Level D PPE, which includes the following:

- Work uniform (long pants, sleeved shirt);
- Hard hat;
- Steel-toed, steel-shanked work boots;
- Safety glasses;
- Boot covers (as needed);
- Hearing protection (as needed); and
- Reflective safety vest.

If required by the SHSO, modified Level D PPE may also be used at the Site during specific activities, consisting of the following:

- Regular Tyvek coveralls (Poly-coated Tyvek as required);
- Outer gloves: leather, cotton, neoprene or nitrile (as required);
- Inner gloves: latex or nitrile (doubled) as required;
- Chemical resistant boots over work boots (as required);
- Steel-toed, steel-shanked work boots;
- Hard hat;
- Safety glasses;

- Hearing protection, as needed; and
- Reflective safety vest.

6.3 Site Control for Unexpected Conditions

In the event that unexpected conditions or hazardous waste is encountered, thereby requiring workers trained in accordance with 29 CFR 1910.120, the following four-zone approach will be employed in order to prevent the spread of the contamination from the area containing the unexpected condition and to protect Site Workers. The four-zones include the Exclusion Zone, the Contamination Reduction Zone, the Remediated Zone, and the Support Zone. A stepped remedial approach will be managed, and the zones modified as the work progresses. Each of the areas will be defined through the use of control barricades and/or construction/hazard fencing. A clearly marked delineation between the zones will be maintained. Signage will be posted to further identify and delineate these areas.

The following subsections describe the four zones that will be utilized in the event that unexpected conditions or contamination is discovered at the Site.

6.3.1 Exclusion Zone

The area where the unexpected condition is discovered would be considered the Exclusion Zone (EZ). All excavation and handling of contaminated materials generated as a result of the discovery of an unexpected condition would take place within the EZ. This zone will be clearly delineated by hay bales, jersey barriers, and/or similar methods. Safety tape may be used as secondary delineation within the EZ. The zone delineation markings may be opened in areas for varying lengths of time to accommodate equipment operation or specific construction activities. The SHSO may establish more than one EZ where different levels of protection may be employed or where different hazards exist. Site Workers will not be allowed in the EZ without:

- A buddy (co-worker);
- Appropriate PPE;
- Medical authorization; and
- Training certification.

6.3.2 Contamination Reduction Zone

A Contamination Reduction Zone (CRZ) will be established between the EZ and the property limits. The CRZ contains the Contamination Reduction Corridor (CRC) and provides an area for decontamination of Site Workers and equipment. The CRZ will be used for general Site entry and egress, in addition to access for heavy equipment and emergency support services. Site Workers will not be allowed in the CRZ without:

- A buddy (co-worker);
- Appropriate PPE;
- Medical authorization; and
- Training certification.

6.3.3 Remediated Zone

A Remediated Zone (RZ) will be established in portions of the Site where the remediation has been completed and only general construction work will be performed. Setup of the RZ will consist of implementing several measures designed to reduce the risk of workers' exposure and prevent non-trained workers from entering the non-remediated zone. Non-trained workers will work only in areas where the potential for exposure has been minimized by removal of all hazardous materials. The remediated zone will then be separated from the non-remediated zone by installing and maintaining temporary plywood or other construction fences along the boundary between the two zones. If potentially impacted material is uncovered in the RZ, all non-trained workers will be removed, and the SHSO will assess the potential risks. If, at any other time, the risk of exposure increases while non-trained workers are present in the RZ, the non-trained workers will be removed. At all times, when non-trained workers are present in the RZ, air monitoring for the presence of VOCs will be conducted in the RZ, as well as at the fence line of the non-remediated zone.

6.3.4 Support Zone

The Support Zone (SZ) will be an uncontaminated area that will be the field support area for the Site operations. The SZ will contain the temporary project trailers and provides for field team communications and staging for emergency response. Appropriate sanitary facilities and safety equipment will be located in this zone. Potentially contaminated Site Workers or materials are not allowed in this zone. The only exception will be appropriately packaged/decontaminated and labeled samples. Meteorological conditions will be observed and noted from this zone, as well as those factors pertinent to heat and cold stress.

7. Monitoring Procedures

A Community Air Monitoring Plan (CAMP) will be conducted in the active work areas during all excavation/truck loading activities, or as mandated by the SHSO.

Based on the results of Roux's Phase II ESA, SVOCs, specifically PAHs, metals, and pesticides are present in soil across the Site. Since the Site redevelopment includes excavation and soil disturbance, particulates will be monitored. Although VOCs were either not detected above laboratory reporting limits or below New York Part 375 Unrestricted Use Soil Cleanup Objectives, limited VOC monitoring is included as part of the CAMP.

The monitoring program will monitor for particulates at the upwind and downwind perimeters of the work area during ground intrusive activities. The design of the CAMP is intended to provide a measure of protection for the downwind community and onsite workers not directly involved with the subject work activities from potential airborne contaminant releases as a direct result of remedial work and demolition activities.

Work zone monitoring will also need to be performed to verify the adequacy of the Level D respiratory protection, to aid in Site layout, and to document monitoring results. If air monitoring in these areas indicates the presence of potentially hazardous materials, control measures will be implemented. All monitoring instruments shall be operated by qualified personnel only and will be calibrated prior to use daily or more often, as necessary. No excavation or truck loading activities will be performed without the presence of the SHSO or designated approved substitute at the Site, and without air monitoring. The SHSO is responsible for ensuring that appropriate monitoring, levels of protection, and safety procedures are followed.

7.1 Instrumentation

The following monitoring instruments will be available for use during field operations, as necessary. There will be a minimum of two of each piece of equipment on the Site at all times:

- Photoionization Detector (PID) with 10.6 EV probe, Flame Ionization Detector (FID), or equivalent.
- Dust/Particulate Monitor (DM), TSI DustTrak, or equivalent.

A PID and/or FID equipped organic vapor meter shall be used to monitor VOCs in and around active work areas during excavation and truck loading activities. VOCs shall also be measured upwind of the work areas to determine background concentrations.

A particulate monitor shall be used to measure concentrations of dust and particulate matter in and around the active work areas. Particulates shall also be measured upwind of the work areas to determine background concentrations.

All instruments shall be calibrated daily prior to use in accordance with the manufacturer's procedures. Calibration records shall be documented and recorded daily.

The frequency of monitoring should be determined by the SHSO after consultation with the CSS/GSS. The rationale for any modification must be documented and maintained by the SHSO in the onsite health and safety files.

7.2 Action Levels

Action levels for the upgrading of PPE requirements in the CHASP will apply to all Site work including excavation, soil handling, foundation work, and truck and equipment cleaning activities. These action levels are for known contaminants measured using direct reading instruments in the Breathing Zone (BZ) for VOCs and particulates. The BZ will be determined by the SHSO but is typically 4 to 5 feet above the work area surface or elevation. Action levels will be specific in the Construction Manager's HASP.

An air horn will be readily available in the Site trailer. An additional air horn will be located in the work area to alert Site Workers to an emergency situation. In the event of an emergency or the need to upgrade the level of personal protection, sharp blasts of the air horn will be sounded. If the level of respiratory protection needs to be upgraded, the Contractor will immediately contact the Construction Manager and Owner's Representative.

Action levels will be specific in the CAMP and are provided in Section 3.3 of the RAP.

8. Vehicle/Site Worker Cleaning Areas and Disposal Procedures

This section details the specific vehicle/Site Worker cleaning and waste disposal procedures to be implemented at the Site during the excavation and truck loading activities.

8.1 Contamination Prevention

Contamination prevention should minimize worker exposure and help to avoid spreading Site derived soil onto the public roadways. Procedures for prevention include:

Site Workers

- Do not directly handle or touch soil.
- No eating or drinking in the soil areas.
- Particular care should be taken to protect any skin injuries.
- Stay upwind of dust.
- Do not use cigarettes, cosmetics, gum, etc., in areas of soil.
- Care should be taken to limit the amount of soil that comes in contact with heavy equipment (tires).
- If tools used in soil are to be placed on equipment for transport to an area where all soil has been removed or to be cleaned, plastic should be used to keep the equipment clean.
- Dust control measures, including water misting, will be used on roads inside the Site boundaries.

8.2 Vehicle Cleaning Area/Stabilized Construction Entrances

One or more temporary vehicle cleaning areas will be constructed to clean disposal trucks and other vehicles and equipment prior to leaving the Site. This area will reduce the amount of soil that disposal trucks and other vehicles spread onto the public roadway. The vehicle cleaning area will be constructed of gravel and will be of sufficient size to prevent vehicles from spreading Fill/Soils onto the public roads and/or previously excavated areas of the Site where all soil has been removed. Before any disposal truck or other vehicle leaves the Site, the sides and wheels will be inspected. If any soils are observed on the wheels or body of the truck, they will be removed and collected for disposal using a shovel, broom, and/or other hand tools in the designated vehicle cleaning area. This will reduce the potential for disposal trucks to spread Site-derived material onto the public streets. This vehicle cleaning area may be upgraded to include wet vehicle cleaning procedures (i.e., power washing or steam cleaning), if deemed necessary by the SHSO, CSS, and/or GSS.

In addition, all equipment used for excavation and other earthwork activities (i.e., excavators, bulldozers, backhoes, etc.) which comes in contact with Fill shall be cleaned at the vehicle cleaning area prior to:

- Crossing into areas of the Site where no exposed soil is present; and
- Leaving the Site.

No equipment will be allowed to leave the Site prior to the SHSO or Site Superintendent's inspection and verification that the equipment was properly cleaned.

8.3 Disposal Procedures

A system of segregating all waste will be developed by the SHSO. All discarded materials, waste materials, or other objects shall be handled in such a way as to preclude the potential for spreading Fill, creating a sanitary hazard, or causing litter to be left onsite. If any potentially contaminated materials (e.g., clothing, gloves, etc.) are generated, they will be bagged or drummed, as necessary, labeled, and segregated for proper disposal. All non-contaminated materials shall be collected and bagged for appropriate disposal as domestic waste.

9. Handling of Potential Hazardous Materials

Based on the results of the previous investigations, hazardous materials have not been identified at the Site. In the event that hazardous soils are identified during the excavation and construction phases of work, the steps for dealing with hazardous conditions will be followed as outlined in Section 6.3.

10. Emergency Plan

The emergency plan outlined in this section will be understood by all Site Workers prior to the start of work so that, should an emergency occur, all parties will know how to respond. During an emergency, the SHSO will perform air monitoring as needed and will assist responding emergency personnel with health and safety information related to the Site. Site Workers will endeavor to keep non-essential personnel away from the incident until the appropriate emergency personnel arrive. At that time, the emergency personnel will take control of the Site. Site Workers may be asked to lend assistance to emergency personnel such as during evacuations, help with the injured, etc.

10.1 Emergency Response Numbers

The following sections provide emergency response and project management phone numbers. Emergencies encountered on this Site will be responded to via offsite emergency services personnel and Site Workers. The following master phone list will be prominently posted at the Contractor’s construction trailer designated as the Site command post.

Emergency Medical Service	911
<u>Police</u> : New York City Police Department (NYPD)	911
<u>Hospital</u> : Bellevue Hospital	(212) 562-4141
<u>Urgent Care</u> : CityMD	(212) 729-4668
National Response Center	(800) 424-8802
Poison Control Center	(800) 222-1222
Chemtrec	(800) 262-8200
<u>Fire</u> : New York City Fire Department (FDNY)	911
New York City Office of Emergency Management	911
Center for Disease Control	(800) 311-3435
USEPA (Region II)	(212) 637-5000
NYSDEC Emergency Spill Response	(800) 457-7362

The table in Section 1.2 provides the contact information for Project Management and Health and Safety Personnel.

10.2 Emergency Evacuation

Evacuation procedures will be discussed prior to the start of work and periodically during safety meetings. In the event of an emergency situation such as fire or an explosion, an air horn or other appropriate device will be sounded for three (3) sharp blasts, indicating the initiation of evacuation procedures. The emergency evacuation route shall be clearly posted in the appropriate Site trailers. Under no circumstances will incoming Site Workers or visitors be allowed to proceed into the area once the emergency signal has been given. Once the alarm has been sounded, the SHSO or GSS must ensure that access for emergency equipment is provided and that all combustion apparatuses have been shut down. All Site Workers will assemble outside of the active work areas and away from the area of danger and the fire department and other emergency response personnel will be notified by telephone of the emergency.

10.3 Injury to Site Workers

Emergency first aid shall be applied onsite as appropriate. In the event that additional medical attention is necessary, the injured worker should be brought to either the urgent care facility or emergency room at the hospital. If the Site Worker is unable to be brought to these facilities, 911 should be called and an ambulance sent to the Site.

10.4 Site Worker Exposure

The following describes the appropriate mitigation measures to be followed in the event that Site Workers are exposed to contaminants.

<u>Skin Contact:</u>	Use copious amounts of soap and water. Wash/rinse affected area thoroughly, then clean or remove PPE and provide appropriate medical attention, if necessary. Eyes should be rinsed for 15 minutes upon chemical contamination.
<u>Inhalation:</u>	Move to fresh air and/or, if necessary, clean or remove PPE and transport to emergency medical facility.
<u>Ingestion:</u>	Clean or remove PPE and transport to emergency medical facility, if necessary.
<u>Puncture Wound or Laceration:</u>	Clean or remove PPE and transport to emergency medical facility, if necessary.

SHSO Certification of Hospital Directions

Name of SHSO: _____

Date: _____

This is to certify that on _____, I personally drove the route to Bellevue Hospital as listed in the CHASP. The Map Routing and Directions were/were not as listed in the plan. Listed below were conditions that resulted in different directions.

Site Health and Safety Officer

TABLES

1. Toxicological, Physical and Chemical Properties of Compounds Potentially Present at the Site

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 109 East 42nd Street, New York, New York 10017

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Acenaphthene	83-32-9	None established	None established	None established	None established	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory system	Eyes, skin, respiratory system	Brown solid
Acenaphthylene	208-96-8	None Established	None established	None established	None established	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory system	Eyes, skin, respiratory system	Yellow Solid Fl. Pt.=251°F
Arsenic (inorganic)	7440-38-2 (metal)	TWA 0.01 mg/m ³	Ca C 0.002 mg/m ³ [15-min]	TWA 0.010 mg/m ³	Ca [5 mg/m ³ (as As)]	Inhalation; ingestion; skin absorption; skin and/or eye contact	Ulceration of nasal septum, dermatitis, GI disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, [potential occupational carcinogen]	Liver, kidneys, skin, lungs, lymphatic sys	Metal: silver-gray or tin-white, brittle, odorless solid BP: sublimes
Barium	7440-39-3	TWA 0.5 mg/m ³	None established	TWA 0.5 mg/m ³	None established	Inhalation, ingestion, skin contact	Irritation skin, respiratory system, digestive system	Skin, eyes, respiratory system	Yellow white powder BP: 1640 C
Benzene	71-43-2	TWA 0.5 ppm STEL 2.5 ppm	Ca TWA 0.1 ppm STEL 1 ppm	TWA 1 ppm ST 5 ppm	Ca [500 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen]	Eyes, skin, respiratory system, blood, central nervous system, bone marrow	Colorless to light yellow liquid with an aromatic odor [Note: Solid below 42 °F] BP: 176°F Fl.Pt. = 12°F LEL: 1.2% UEL: 7.8% Class B Flammable liquid
Benzo[a]anthracene	56-55-3	None established [skin cancer]	None established	None established	None established	Inhalation; ingestion; skin absorption; skin and/or eye contact	Irritation eyes, skin, respiratory system, CNS; skin cancer	Skin	Pale Yellow crystal, solid BP: 438 C
Benzo[a]pyrene	50-32-8	None established [cancer]	TWA 0.1 mg/m ³	TWA 0.2 mg/m ³	None established	Inhalation; ingestion; skin absorption; skin and/or eye contact	POISON. This material is an experimental carcinogen, mutagen, tumorigen, neoplastigen and teratogen. It is a probable carcinogen in humans and a known human mutagen. IARC Group 2A carcinogen. It is believed to cause bladder, skin and lung cancer. Exposure to it may damage the developing fetus. May cause reproductive damage. Skin, respiratory and eye irritant or burns.	Skin, eye, bladder, lung, reproductive	Yellow crystals or powder [found in cigarette smoke, coal tar, fuel exhaust gas and in many other sources] BP: 495 C
Benzo[b]fluoranthene	205-99-2	None established [cancer]	TWA 0.1 mg/m ³	TWA 0.2 mg/m ³	None established	Inhalation; ingestion; skin and/or eye contact	No data were identified on the toxicity of benzo[b]fluoranthene to humans. Based on results of studies in animals, IARC concluded that benzo[b]fluoranthene is possibly carcinogenic to humans	Respiratory system, skin, bladder, kidneys	Off-white to tan powder
Benzo[k]fluoranthene	207-08-9	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory tract, gastrointestinal; fatal if swallowed, inhaled, absorbed through the skin; vomiting, nausea, diarrhea	Lungs, respiratory system	Yellow crystals BP: 480 C
Benzo(g,h,i)perylene	191-24-2	None established	None established	California permissible exposure limits for chemical contaminants (Title 8, Article 107) PEL 0.2 mg/m ³	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, respiratory tract, very toxic to aquatic life with long lasting effects	Eyes, skin, respiratory system	Pale Yellow -Green Crystals BP: 550°C
Beryllium	7440-41-7 (metal)	TWA 0.00005 mg/m ³	Ca C 0.0005 mg/m ³	TWA 0.002 mg/m ³ C 0.005 mg/m ³ (30 minutes) with a maximum peak of 0.025 mg/m ³	Ca [4 mg/m ³ (as Be)]	inhalation, skin and/or eye contact	Berylliosis (chronic exposure): anorexia, weight loss, lassitude (weakness, exhaustion), chest pain, cough, clubbing of fingers, cyanosis, pulmonary insufficiency; irritation eyes; dermatitis; [potential occupational carcinogen]	Eyes, skin, respiratory system	Metal: A hard, brittle, gray-white solid. BP: 4532°F
Cadmium	7440-43-9 (metal)	TWA 0.01 mg/m ³	Ca	TWA 0.005 mg/m ³	Ca [9 mg/m ³ (as Cd)]	inhalation, ingestion	Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen]	respiratory system, kidneys, prostate, blood	Metal: Silver-white, blue-tinged lustrous, odorless solid. BP: 1409°F
Carbon Tetrachloride	56-23-5	TWA 5 ppm STEL 10 ppm	Ca ST 2 ppm (12.6 mg/m ³) [60 minute]	TWA 10 ppm C 25 ppm 200 ppm (5-minute maximum peak in any 4 hours)	Ca [200 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation eyes, skin; central nervous system depression; nausea, vomiting; liver, kidney injury; drowsiness, dizziness, incoordination; [potential occupational carcinogen]	central nervous system, eyes, lungs, liver, kidneys, skin	Colorless liquid with a characteristic ether-like odor. BP: 170°F
Carbon Monoxide	630-08-0	TWA 25 ppm	TWA 35 ppm C 200 ppm	TWA 50 ppm	1,200 ppm	inhalation	Carboxyhemogloemia	Blood	Colorless, odorless gas

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 109 East 42nd Street, New York, New York 10017

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Chromium	7440-47-3	TWA 0.5 mg/m ³ (metal and Cr III compounds) TWA 0.05 mg/m ³ (water-soluble Cr VI compounds) TWA 0.01 mg/m ³ (insoluble Cr IV compounds)	TWA 0.5 mg/m ³	TWA 1 mg/m ³	250 mg/m ³ (as Cr)	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin; lung fibrosis (histologic)	Eyes, skin, respiratory system	Blue-white to steel-gray, lustrous, brittle, hard, odorless solid. BP: 4788°F
Chrysene; Phenanthrene; Pyrene; Coal tar pitch volatiles	65996-93-2	TWA 0.2 mg/m ³	Ca TWA 0.1 mg/m ³ (cyclohexane-extractable fraction)	TWA 0.2 mg/m ³ (benzene-soluble fraction)	Ca [80 mg/m ³]	Inhalation, skin and/or eye contact	Dermatitis, bronchitis, [potential occupational carcinogen]	Respiratory system, skin, bladder, kidneys	Black or dark-brown amorphous residue. Combustible Solids
Coal Tar Pitch Volatiles; Chrysene; Phenanthrene; Pyrene	65996-93-2	TWA 0.2 mg/m ³	Ca TWA 0.1 mg/m ³ (cyclohexane-extractable fraction)	TWA 0.2 mg/m ³ (benzene-soluble fraction)	Ca [80 mg/m ³]	Inhalation, skin and/or eye contact	Dermatitis, bronchitis, [potential occupational carcinogen]	respiratory system, skin, bladder, kidneys	Black or dark-brown amorphous residue. Combustible Solids
1,1-Dichloroethane	75-34-3	TWA 100 ppm	TWA 100 ppm (400 mg/m ³)	TWA 100 ppm (400 mg/m ³)	3000 ppm	inhalation, ingestion, skin and/or eye contact	Irritation skin; central nervous system depression; liver, kidney, lung damage	Skin, liver, kidneys, lungs, central nervous system	Colorless, oily liquid with a chloroform-like odor. BP: 135°F F.I.P: 2°F UEL: 11.4% LEL: 5.4%
1,2-Dichloroethane (Ethylene Dichloride)	107-06-2	TWA 10 ppm	Ca TWA 1 ppm (4 mg/m ³) STEL 2 ppm (8 mg/m ³)	TWA 50 ppm C 100 ppm 200 ppm [5-minute maximum peak in any 3 hours]	Ca [50 ppm]	inhalation, ingestion, skin absorption, skin and/or eye contact	Irritation eyes, corneal opacity; central nervous system depression; nausea, vomiting; dermatitis; liver, kidney, cardiovascular system damage; [potential occupational carcinogen]	Eyes, skin, kidneys, liver, central nervous system, cardiovascular system	Colorless liquid with a pleasant, chloroform-like odor. [Note: Decomposes slowly, becomes acidic & darkens in color.] BP: 182°F F.I.P: 56°F UEL: 16% LEL: 6.2% Class IB Flammable Liquid
1,2-Dichloroethene (total)	540-59-0	TWA 200 ppm	TWA 200 ppm (790 mg/m ³)	TWA 200 ppm (790 mg/m ³)	1000 ppm	inhalation, ingestion, skin and/or eye contact	Irritation eyes, respiratory system; central nervous system depression	Eyes, respiratory system, central nervous system	Colorless liquid (usually a mixture of the cis & trans isomers) with a slightly acrid, chloroform-like odor BP: 118-140°F F.I.P: 36-39°F UEL: 12.8% LEL: 5.6% Class IB Flammable Liquid
cis-1,2-Dichloroethene	156-59-2	TWA 200 ppm	TWA 200 ppm	TWA 200 ppm	None established	inhalation, skin absorption, ingestion	Harmful if swallowed, inhaled, or absorbed through skin. Irritant. Narcotic. Suspected carcinogen	Skin	Colorless liquid BP: 60 C F.I.P: 4 C UEL: 12.8% LEL: 9.7 %
trans-1,2-Dichloroethene	156-60-5	TWA 200 ppm	None established	TWA 200 ppm STEL 250 ppm (skin)	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Narcotic. Irritation eyes, skin, respiratory tract, mucous membrane; CNS depression.	Respiratory tract, mucous membrane, eyes, skin, CNS	Colorless liquid with a fruity pleasant odor BP: 48°C F.I.P 6C UEL: 12.8% LEL: 9.7%
Dibenzo[a,h]anthracene	53-70-3	None established	None established	None established	None established	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin	Eyes, skin; skin photosensitization.	Colorless crystalline powder BP: 524°C
Dibenzofuran	132-64-9								
Diesel Fuel #2	68476-34-6	TWA 100 mg/m ³ ; Skin notation	None established	Designated as an OSHA Select Carcinogen	None established	ingestion, skin and/or eye contact	Kidney damage; potential lung damage; suspected carcinogen; irritation of eyes, skin, respiratory tract; dizziness, headache, nausea; chemical pneumonitis (from aspiration of liquid); dry, red skin; irritant contact dermatitis; eye redness, pain.	Eyes, skin, kidneys	Clear yellow brown combustible liquid; floats on water; distinct diesel petroleum hydrocarbon odor. BP: 356-716°F F.I.P: 154.4-165.2°F LEL: 0.6% UEL: 7.0%
Ethylbenzene	100-41-4	TWA 20 ppm	TWA 100 ppm (435 mg/m ³) STEL 125 ppm (545 mg/m ³)	TWA 100 ppm (435 mg/m ³)	800 ppm [10%LEL]	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma	Eyes, skin, respiratory system, central nervous system	Colorless liquid with an aromatic odor. BP: 277°F F.I.P: 55°F UEL: 6.7% LEL: 0.8% Class IB Flammable Liquid
Fluoranthene	206-44-0	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; possible burns; heart and liver injury, pulmonary edema, respiratory arrest, gastrointestinal disturbances.	Heart, liver, lungs.	Yellow needles.

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Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Fuel Oil #2	68476-30-2	TWA 100 mg/m ³ ; Skin notation	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; CNS effects; nausea, vomiting, headache, cramping, dizziness, weakness, loss of coordination,, drowsiness; kidney, liver damage	Eyes, skin, CNS	Clear or yellow to red oily liquid, kerosene-like odor BP: 347 - 689 °F UEL:5-6% LEL: 0.7-1.0%
Gasoline	8006-61-9	TWA 300 ppm STEL 500 ppm	Carcinogen	None established	Ca [IDLH value has not been determined]	Skin absorption; inhalation; ingestion; skin and/or eye contact	Eyes and skin irritation, mucous membrane; dermatitis; headache; listlessness, blurred vision, dizziness, slurred speech, confusion, convulsions; chemical pneumonitis; possible liver, kidney damage [Potential occupational carcinogen]	Eyes, skin, respiratory system, CNS, Liver, Kidneys	Clear liquid with a characteristic odor, aromatic Fl.Pt. = -45°F LEL = 1.4% UEL = 7.6% Class 1B Flammable Liquid
Hydrogen Sulfide	7783-06-4	TWA 1 ppm STEL 5 ppm	C 10 ppm (15 mg/m ³) [10-minute]	C 20 ppm 50 ppm [10-minute maximum peak]	100 ppm	inhalation, skin and/or eye contact	Irritation eyes, respiratory system; apnea, coma, convulsions; conjunctivitis, eye pain, lacrimation (discharge of tears), photophobia (abnormal visual intolerance to light), corneal vesiculation; dizziness, headache, lassitude (weakness, exhaustion), irritability, insomnia; gastrointestinal disturbance; liquid: frostbite	Eyes, respiratory system, central nervous system	Colorless gas with a strong odor of rotten eggs. BP: -77°F UEL: 44.0% LEL: 4.0% Flammable Gas
Indeno[1,2,3-cd]pyrene	193-39-5	None established	None established	None established	None established	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; possible human carcinogen (skin); weakness; affect liver, lung tissue, renal tissue; impairment of blood forming tissue	Skin	Fluorescent green-yellow crystalline solid BP: 536 C
Lead (inorganic)	7439-92-1	TWA 0.05 mg/m ³	TWA (8-hour) 0.050 mg/m ³	TWA 0.050 mg/m ³	100 mg/m ³ (as Pb)	inhalation, ingestion, skin and/or eye contact	Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension	Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue	A heavy, ductile, soft, gray solid. BP: 3164°F Noncombustible Solid in bulk form
Mercury (organo) alkyl compounds (as Hg)	7439-97-6	TWA 0.01 mg/m ³ STEL 0.03 mg/m ³ [skin]	TWA 0.01 mg/m ³ STEL 0.03 mg/m ³ [skin]	TWA 0.01 mg/m ³ C 0.04 mg/m ³	2 mg/m ³ (as Hg)	inhalation, skin absorption, ingestion, skin and/or eye contact	Paresthesia; ataxia, dysarthria; vision, hearing disturbance; spasticity, jerking limbs; dizziness; salivation; lacrimation (discharge of tears); nausea, vomiting, diarrhea, constipation; skin burns; emotional disturbance; kidney injury; possible teratogenic effects	Eyes, skin, central nervous system, peripheral nervous system, kidneys	Appearance and odor vary depending upon the specific (organo) alkyl mercury compound
Mercury compounds [except (organo) alkyls] (as Hg) Mercury	7439-97-6	TWA 0.025 mg/m ³ (elemental and inorganic forms)	Hg Vapor: TWA 0.05 mg/m ³ [skin] Other: C 0.1 mg/m ³ [skin]	TWA 0.1 mg/m ³	10 mg/m ³ (as Hg)	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria	Eyes, skin, respiratory system, central nervous system, kidneys	Metal: Silver-white, heavy, odorless liquid. [Note: "Other" Hg compounds include all inorganic & aryl Hg compounds except (organo) alkyls.] BP: 674°F
Methylene Chloride (Dichloromethane)	75-09-2	TWA 50 ppm, A3 - suspected human carcinogen	Ca	TWA 25 ppm STEL 125 ppm	Ca [2300 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; lassitude (weakness, exhaustion), drowsiness, dizziness; numbness, tingle limbs; nausea; [potential occupational carcinogen]	Eyes, skin, cardiovascular system, central nervous system	Colorless liquid with a chloroform-like odor BP: 104°F UEL: 23% LEL: 13%
Naphtha (Rubber Solvent)	8030-30-6	None established	TWA 100 ppm (400 mg/m ³)	TWA 100 ppm (400 mg/m ³)	1000 ppm [10%LEL]	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose; dizziness, drowsiness; dermatitis; in animals: liver, kidney damage	Eyes, skin, respiratory system, central nervous system, liver, kidneys	Reddish-brown, mobile liquid with an aromatic odor BP: 320-428°F Fl.P: 100-109°F Class II Combustible Liquid
Naphthalene	91-20-3	TWA 10 ppm [skin]	TWA 10 ppm (50 mg/m ³) STEL 15 ppm (75 mg/m ³)	TWA 10 ppm (50 mg/m ³)	250 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes; headache, confusion, excitement, malaise (vague feeling of discomfort); nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; jaundice; hematuria (blood in the urine), renal shutdown; dermatitis, optical neuritis, corneal damage	Eyes, skin, blood, liver, kidneys, central nervous system	Colorless to brown solid with an odor of mothballs. BP: 424°F Fl.P: 174°F UEL: 5.9% LEL: 0.9%
Petroleum hydrocarbons(Petroleum distillates)	8002-05-9	None established	TWA 350 mg/m ³ C 1800 mg/m ³ [15 min]	TWA 500 ppm (2000 mg/m ³)	1,100 [10% LEL]	Inhalation; ingestion; skin and/or eye contact	Irritation eyes, skin, nose, throat; dizziness, drowsiness, headache, nausea; dried/cracked skin; chemical pneumonitis	CNS, eyes, respiratory system, skin	Colorless liquid with a gasoline or kerosene-like odor BP: 86-460°F Fl. Pt = -40 to -86°F UEL: 5.9% LEL: 1.1% Flammable liquid
Polychlorinated Biphenyls (PCBs) (Chlorodiphenyl (42% Chlorine))	53469-21-9	TWA 1 mg/m ³	Ca TWA 0.001 mg/m ³	0.5 mg/m ³	5 ppm	Dermal; inhalation; ingestion; skin and/or eye contact	Irritation eyes; chloracne; liver damage; reproductive effects; [potential occupational carcinogen]	Eyes, skin, liver, respiratory system	Colorless to light-colored, viscous liquid, hydrocarbon odor, BP: 617 - 734°F, non-flammable, LEL: NA, UEL: NA
Selenium	7782-49-2	TWA 0.2 mg/m ³	TWA 0.2 mg/m ³	TWA 0.2 mg/m ³	1 mg/m ³ (as Se)	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; visual disturbance; headache; chills, fever; dyspnea (breathing difficulty), bronchitis; metallic taste, garlic breath, gastrointestinal disturbance; dermatitis; eye, skin burns; in animals: anemia; liver necrosis, cirrhosis; kidney, spleen damage	Eyes, skin, respiratory system, liver, kidneys, blood, spleen	Amorphous or crystalline, red to gray solid. [Note: Occurs as an impurity in most sulfide ores.] BP: 1265°F

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at 109 East 42nd Street, New York, New York 10017

Compound	CAS #	ACGIH TLV	NIOSH REL	OSHA PEL	IDLH	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Silver	7440-22-4 (metal)	TWA 0.1 mg/m ³ (metal, dust, fume) TWA 0.01 mg/m ³ (Soluble compounds, as Ag)	TWA 0.01 mg/m ³	TWA 0.01 mg/m ³	10 mg/m ³ (as Ag)	inhalation, ingestion, skin and/or eye contact	Blue-gray eyes, nasal septum, throat, skin; irritation, ulceration skin; gastrointestinal disturbance	Nasal septum, skin, eyes	Metal: White, lustrous solid BP: 3632°F
Tetrachloroethene	127-18-4	TWA 25 ppm STEL 100 ppm listed as A3, animal carcinogen	Ca Minimize workplace exposure concentrations	TWA 100 ppm C 200 ppm (for 5 minutes in any 3-hour period), with a maximum peak of 300 ppm	Ca [150 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]	Eyes, skin, respiratory system, liver, kidneys, central nervous system	Colorless liquid with a mild, chloroform-like odor. BP: 250°F Noncombustible Liquid
Toluene	108-88-3	TWA 20 ppm	TWA 100 ppm (375 mg/m ³) STEL 150 ppm (560 mg/m ³)	TWA 200 ppm C 300 ppm 500 ppm (10-minute maximum peak)	500 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, nose; lassitude (weakness, exhaustion), confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage	Eyes, skin, respiratory system, central nervous system, liver, kidneys	Colorless liquid with a sweet, pungent, benzene-like odor. BP: 232°F Fl.P: 40°F UEL: 7.1% LEL: 1.1% Class IB Flammable Liquid
1,1,1-Trichloroethane (Methyl Chloroform)	71-55-6	TWA 350 ppm STEL 450 ppm	C 350 ppm (1900 mg/m ³) [15-minute]	TWA 350 ppm (1900 mg/m ³)	700 ppm	inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin; headache, lassitude (weakness, exhaustion), central nervous system depression, poor equilibrium; dermatitis; cardiac arrhythmias; liver damage	Eyes, skin, central nervous system, cardiovascular system, liver	Colorless liquid with a mild, chloroform-like odor. BP: 165°F UEL: 12.5% LEL: 7.5%
Trichloroethene	79-01-6	TWA 10 ppm STEL 25 ppm	Ca	TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)	Ca [1000 ppm]	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]	Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system	Colorless liquid (unless dyed blue) with a chloroform-like odor. BP: 189°F UEL(77°F): 10.5% LEL(77°F): 8%
Vinyl Chloride	75-01-4	TWA 1 ppm	Carcinogen	TWA 1 ppm C 5 ppm [15-minute]	Ca [IDLH value has not been determined]	inhalation, skin, and/or eye contact (liquid)	Lassitude (weakness, exhaustion); abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities; liquid: frostbite; [potential occupational carcinogen]	Liver, central nervous system, blood, respiratory system, lymphatic system	Colorless gas or liquid (below 7°F) with a pleasant odor at high concentrations. BP: 7°F UEL: 33.0% LEL: 3.6% Flammable Gas
Xylene (m, o & p isomers)	108-38-3, 95-47-6, 106-42-3	TWA 100 ppm STEL 150 ppm	TWA 100 ppm (435 mg/m ³)	TWA 100 ppm (435 mg/m ³)	900 ppm	Skin absorption, inhalation, ingestion, skin, and/or eye contact	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis	Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys	Colorless liquid with an aromatic odor BP: 282°F, 292°F, 281°F Fl. Pt. 82°F, 90°F, 81°F UEL: 1.1%, 0.9%, 1.1% LEL: 7.0%, 6.7%, 7.0% Class C Flammable Liquid
Zinc Oxide	1314-13-2	TWA 2 mg/m ³ STEL 10 mg/m ³	None established	TWA 10 mg/m ³ (for zinc oxide fume)	None established	skin and/or eye contact, inhalation, ingestion	Irritation eyes, skin, respiratory tract; gastrointestinal disturbances	Eyes, skin, respiratory system,	Bluish gray solid BP: 1664.6°F Flammable

References

U.S. Department of Labor. 1990. OSHA Regulated Hazardous Substances, industrial Exposure and Control Technologies Government Institutes, Inc.
 Hawley's Condensed Chemical Dictionary, Sax, N. Van Nostrand and Reinhold Company, 11th Edition, 1987.
 Proctor, N.H., J.P. Hughes and M.L. Fischman, 1989. Chemical Hazards of the Workplace. Van Nostrand Reinhold. New York.
 Sax, N.I. and R.J. Lewis. 1989. Dangerous Properties of Industrial Materials. 7th Edition. Van Nostrand Reinhold. New York.
 2017 TLVs® and BEIs®, American Conference of Industrial Hygienists

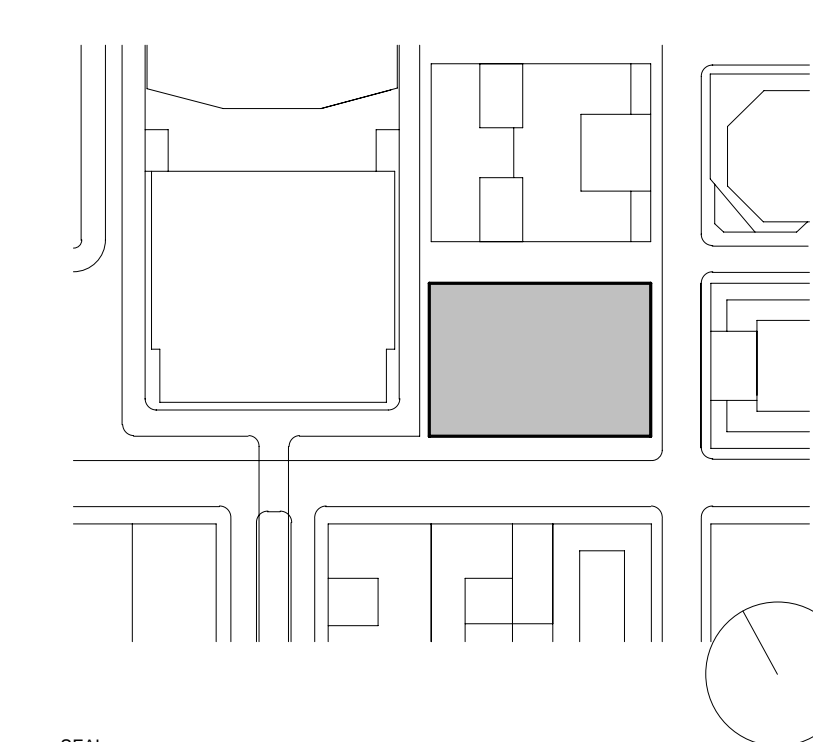
Abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienists.
 BP – boiling point at 1 atmosphere, °F
 C – Ceiling, is a concentration that should not be exceeded during and part of the working exposure.
 CAS# - Chemical Abstracts Service registry number which is unique for each chemical.
 Ft Pt. – Flash point
 IDLH - Immediately Dangerous to Life and Health concentrations represent the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.
 LEL – Lower explosive (flammable) limit in air, % by volume (at room temperature)
 mg/m³ – Milligrams of substance per cubic meter of air
 NIOSH - National Institute for Occupational Safety and Health.
 OSHA – Occupational Safety and Health Administration
 PEL - OSHA Permissible Exposure Limit (usually) a time weighted average concentration that must not be exceeded during any 8 hour work shift of a 40 hr work week.
 ppm – parts per million
 REL – NIOSH Recommended Limit indicated a time weighted average concentration that must not be exceeded during any 10 hour work shift of a 40 hr work week
 SG - Specific Gravity
 STEL – Short-term exposure limit (ST)
 TLV - ACGIH Threshold Limit Values (usually 8 hour time weighted average concentrations).
 TWA – 8-hour, time-weighted average
 UEL – Upper explosive (flammable) limit in air, % by volume (at room temperature)
 VP - Vapor Pressure

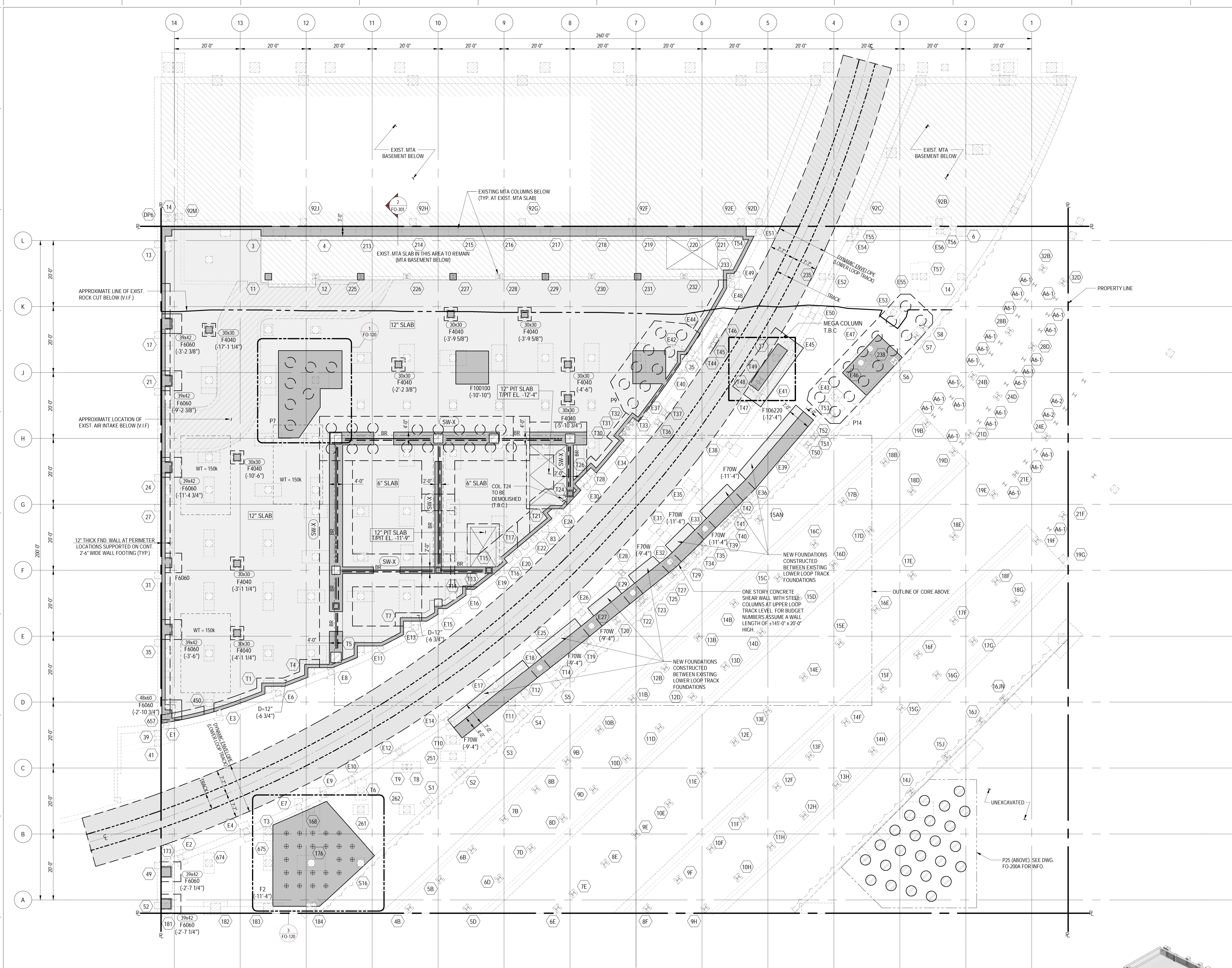
FIGURES

1. Emergency Route to Hospital and Urgent Care

Hybrid Foundation Plan Progress Prints



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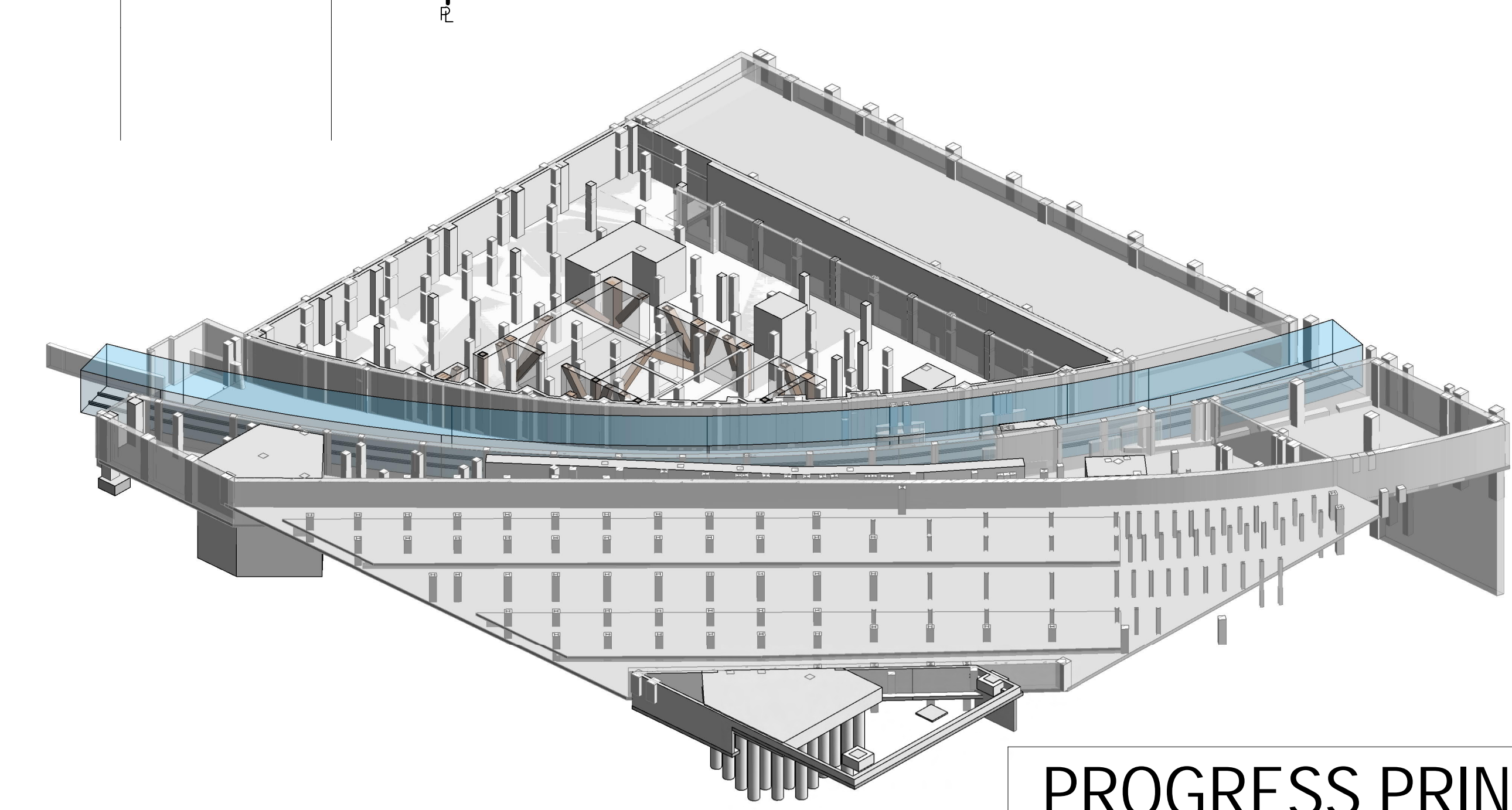
1 FOUNDATION (SUB-CELLAR 2) OVERALL FRAMING PLAN (HYBRID OPTION)
SCALE: 3/32" = 1'-0"

FOOTING SCHEDULE (Fc = 14,000 PSI) (HYBRID FOUNDATION)				
ALLOWABLE BEARING PRESSURE = 120 TONS/SF U.O.N.				
MARK	SIZE	SOCKET DEPTH	REINFORCING	REMARKS
F70W	8'-4" WIDE	10'-0"	331 LBS/CUBIC YD.	SOCKETED INTO ROCK & SIDE FRICTION
F40A0	4'-0" x 4'-0"	3'-0"	150 LBS/CUBIC YD.	SOCKETED INTO ROCK (60 TSF)
F6060	6'-0" x 6'-0"	3'-0"	331 LBS/CUBIC YD.	SOCKETED INTO ROCK (60 TSF)
F100100	10'-0" x 10'-0"	10'-0"	331 LBS/CUBIC YD.	SOCKETED INTO ROCK
F106220	10'-6" x 22'-0"	10'-0"	331 LBS/CUBIC YD.	SOCKETED INTO ROCK

MEGA COLUMN FOOTING SCHEDULE (Fc = 14,000 PSI) (HYBRID FOUNDATION)				
ALLOWABLE BEARING PRESSURE = 120 TONS/SF U.O.N.				
MARK	SIZE	SOCKET DEPTH	REINFORCING	REMARKS
F2	SEE DRAWING FO-120	10'-0"	331 LBS/CUBIC YD.	SOCKETED INTO ROCK. SEE DWG. FO-120

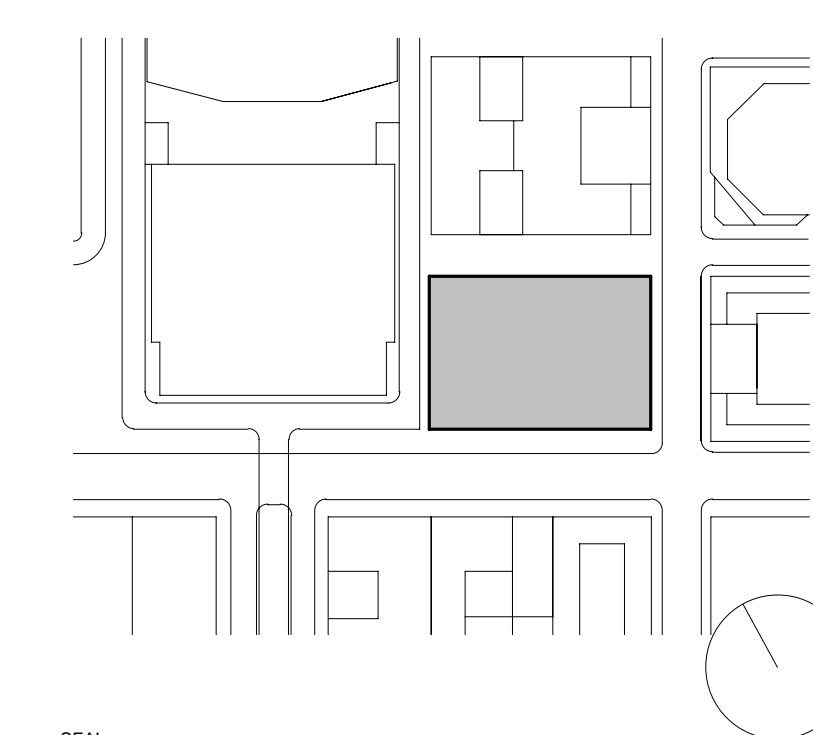
NOTES:
1. AT MEGA COLUMN LOCATIONS WHEN FOOTING SIZE MATCHES MEGA COLUMN SIZE, CONTRACTOR CAN MAKE ALLOWANCE FOR SOCKETING COLUMN INTO ROCK BY MINIMUM THICKNESS SHOWN IN TABLE ABOVE AS THE EQUIVALENT FOUNDATION.
2. SOCKET DEPTH TO BE MEASURED FROM TOP OF 60 TSF ROCK.

- NOTES:
1. TOP OF SLAB ELEVATION TO BE 5'-2" (NAVD 88) U.O.N. ON PLAN THUS [] ALL ELEVATIONS REFER TO NAVD88
2. SLAB TO BE 6" THICK U.O.N. ON PLAN THUS []
3. SLAB REINFORCEMENT TO BE: #8@12 E.W., T&B FOR 12" SLAB; #8@12 E.W., T&B FOR 14" SLAB
4. FOOTINGS TO BE CENTERED ON COLUMNS OR WALLS U.O.N.
5. TOP OF FOOTING TO BE 1'-0" BELOW TOP OF SLAB U.O.N. ON PLAN
6. BOTTOM OF COLUMN AND MEGA COLUMN ELEVATIONS ARE BASED OFF OF EXPECTED ROCK DEPTH AS PER LANGAN SKETCH DATED 09/18/2020
7. ROCK AT NEW FOUNDATION WALLS SHALL BE STABILIZED PER RECOMMENDATION OF GEOTECHNICAL ENGINEER
8. PROVIDE DOWELS IN FOOTING TO MATCH VERT WALL REINFC. COLUMN REINFC. (TYP.)
9. FOR UNDERGROUND PIPING SEE ARCH. MECH. DRAWINGS
10. FOR GENERAL NOTES, ABBREVIATIONS AND LEGEND SEE DWG. FO-001
11. FOR FOUNDATION TYPICAL DETAILS SEE FO-200 SERIES DRAWINGS
12. FOR FOUNDATION SECTIONS SEE FO-300 SERIES DRAWINGS
13. FOR SHEARWALL DETAILS SEE S-XXX SERIES DRAWINGS
14. FOR COLUMN AND BUTTRESS SIZES, REINFORCEMENT AND DETAILS SEE FO-120 AND S-XXX SERIES DRAWINGS
15. FOR STAIR LOCATIONS SEE ARCHITECTS DRAWINGS
16. FOR MASS CONCRETE CONSTRUCTION, CONTRACTOR SHALL COMPLY WITH ACI-301.207 & NYC BUILDING CODE. CONCRETE TEMP. (FOR MASS CONCRETE) AT THE TIME OF PLACEMENT TO BE MAINTAINED AT 55-60° F. CONTRACTOR TO PROVIDE DESIGN MIX & THERMAL CONTROL PLAN TO ENGINEER OF RECORD FOR APPROVAL. EOR FINAL APPROVAL SUBJECT TO REVIEW OF SATISFACTORY MOCKUP RESULTS.

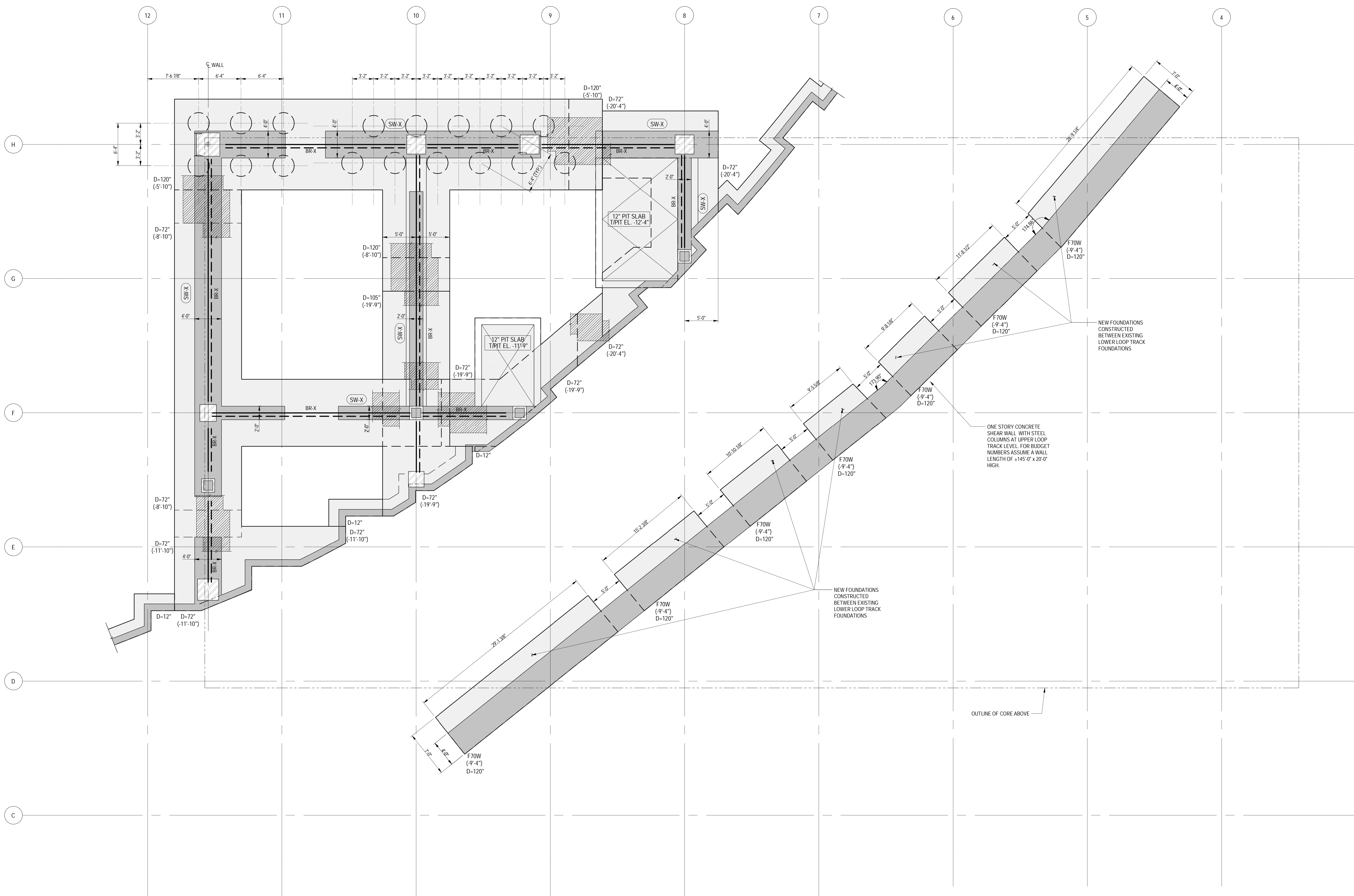


3D VIEW

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1 CORE FOUNDATION PLAN (HYBRID OPTION)

SCALE: 3/8" = 1'-0"

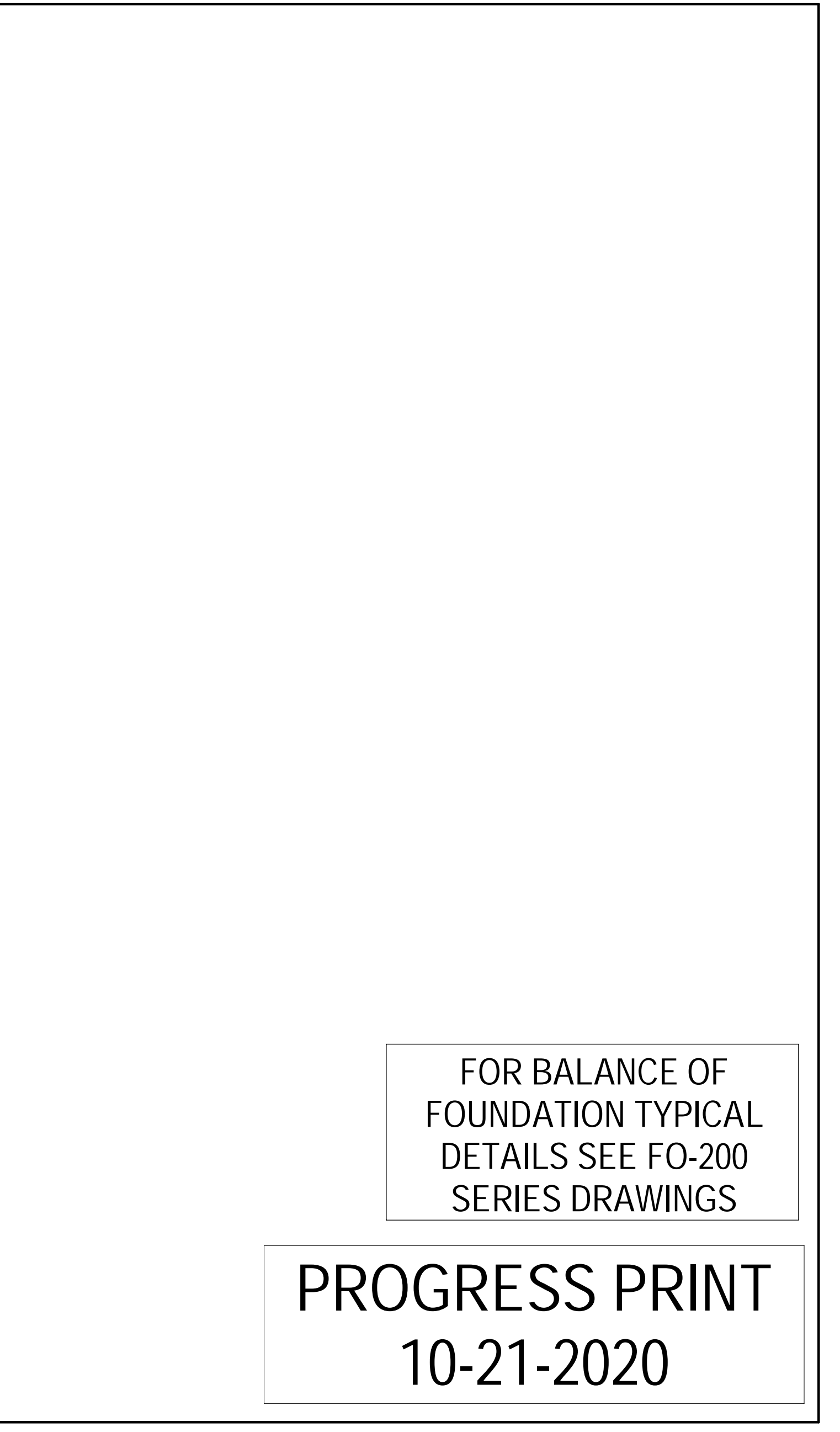
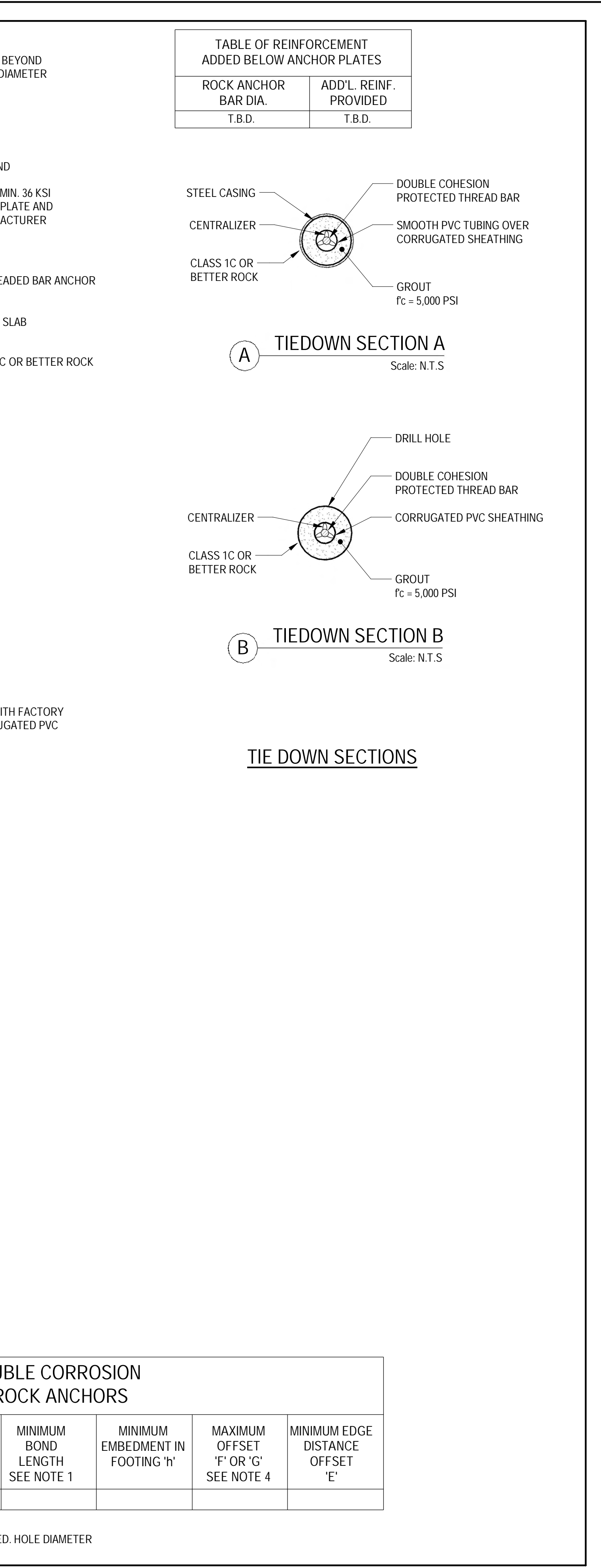
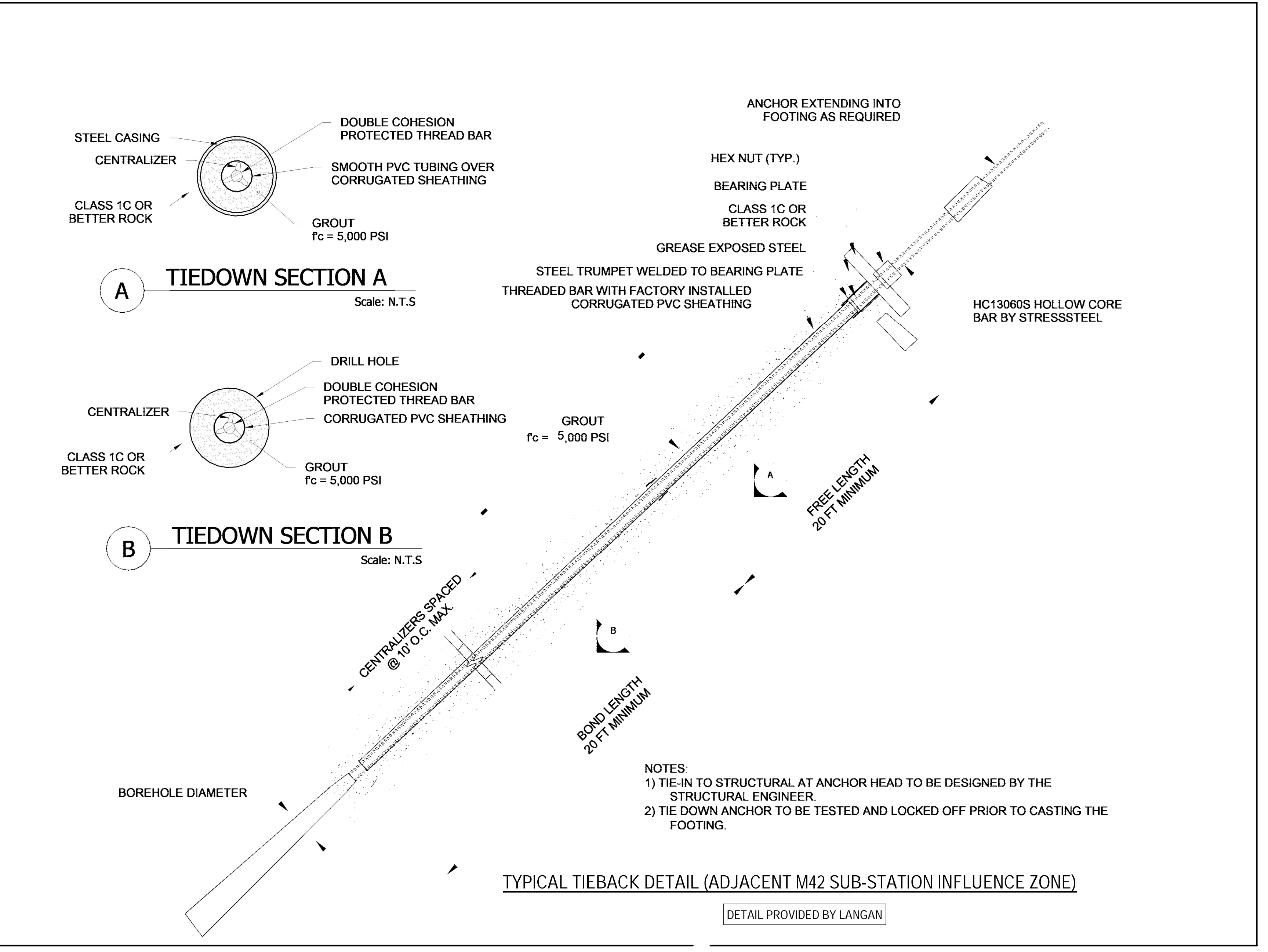
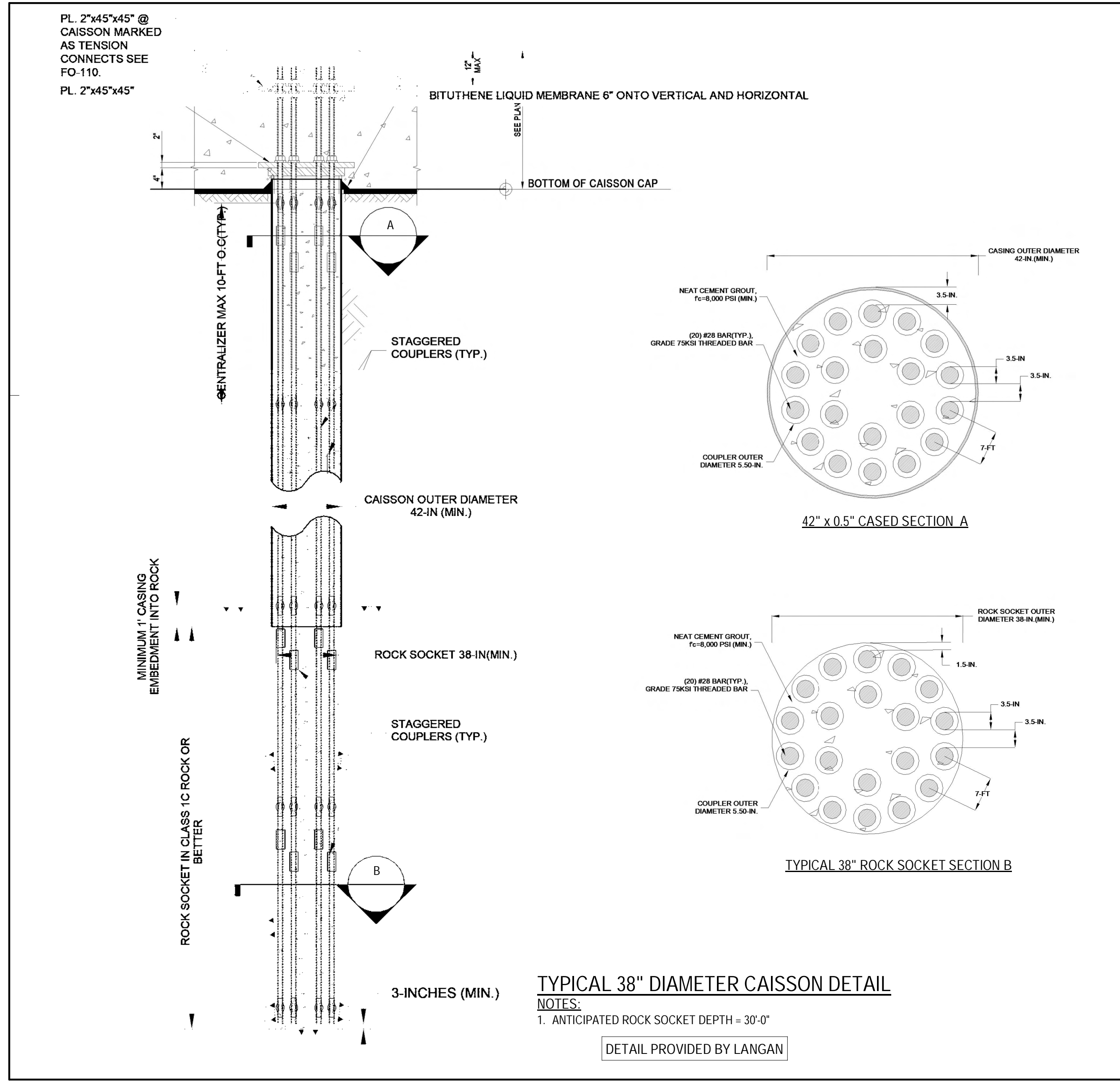
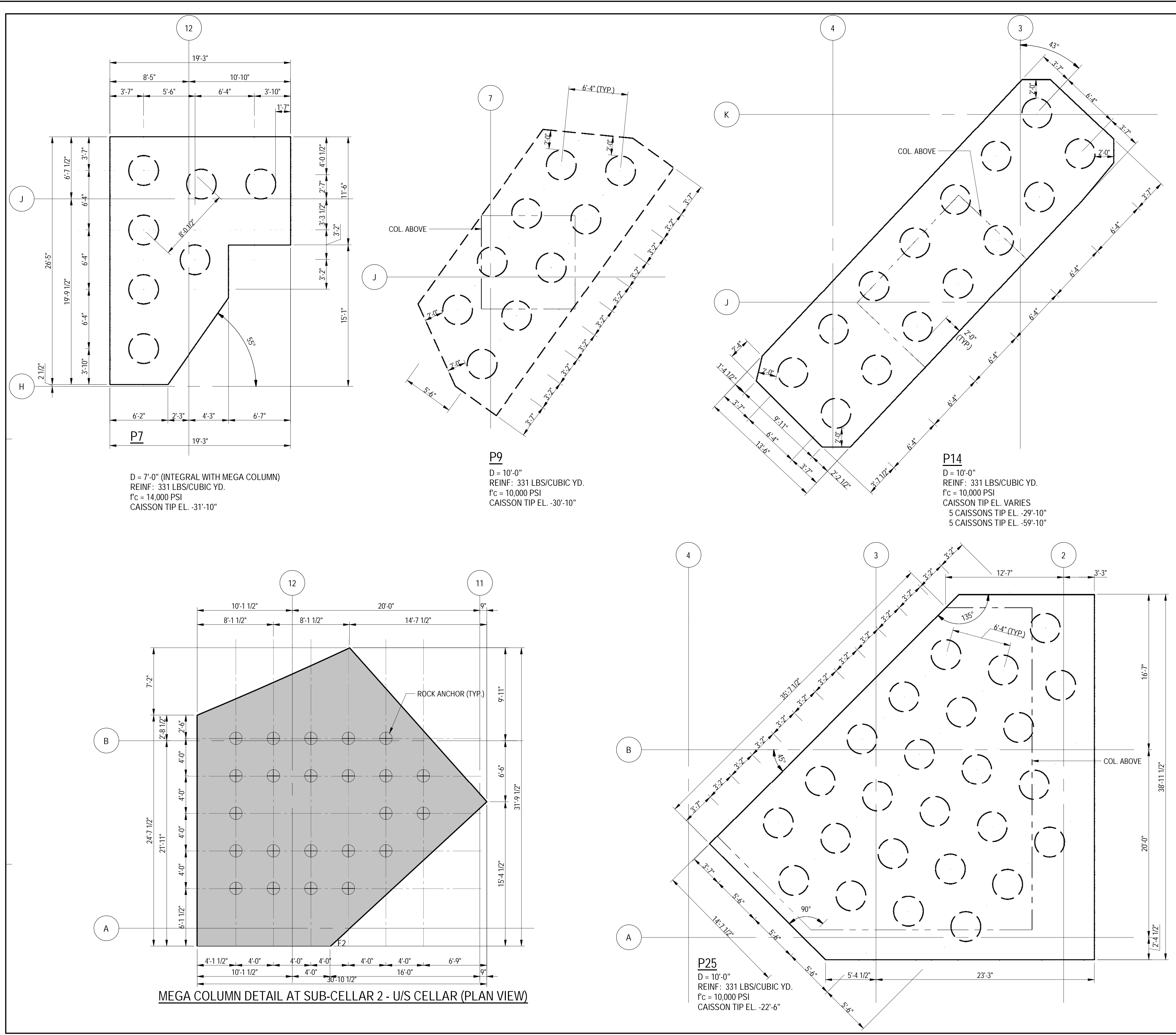
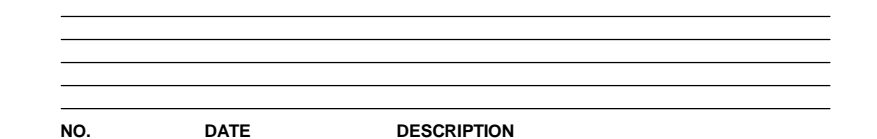
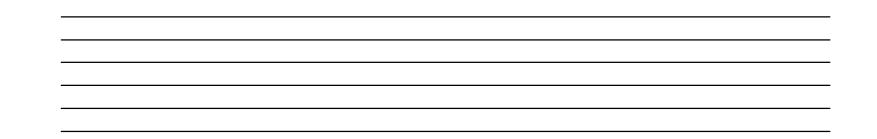
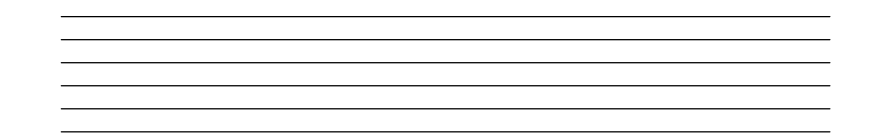
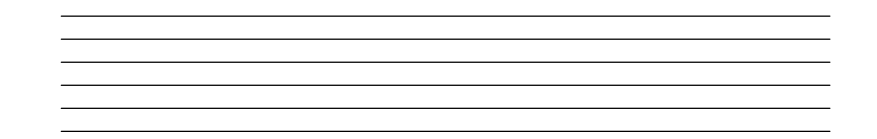
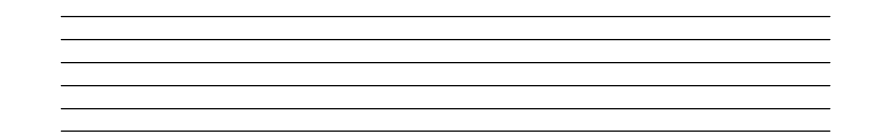
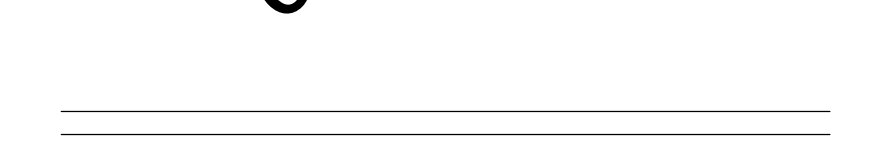
NOTES:

1. ALL #11 REINFORCEMENT SHALL BE ASTM A615 GR. 75 (fy=75 ksi).
2. OUTER-MOST REINFORCEMENT TO BE PLACED IN NORTH-SOUTH DIRECTION.
3. SEE TYPICAL ROCK ANCHORAGE DETAIL ON DRAWING FO-200.
4. FOR BALANCE OF NOTES, SEE OVERALL FOUNDATION PLAN DRAWING FO-100.
5. MAT FOUNDATION TO BE SOCKETTED INTO ROCK TO ACHIEVE 90 TSF BEARING CAPACITY U.O.N. ON PLAN.
6. ALL MAT DIMENSIONS SHOWN ARE FROM THE CENTER LINE OF SHEAR WALL U.O.N.
7. A CLEAR SPACING OF 1'-5" TO BE MAINTAINED BETWEEN EACH VERTICAL LAYER OF REBAR.
8. TOP AND BOTTOM BARS TO BE PLACED CONTINUOUS THROUGHOUT THE LENGTH OF THE MAT IN THE DIRECTION INDICATED.

LEGEND:

- INDICATES CONTINUOUS MAT BOTTOM BAR.
- INDICATES CONTINUOUS MAT TOP BAR.
- ▨ INDICATES AREA OF MAT TO BE SUPPORTED ON ROCK WITH 120 TSF BEARING CAPACITY

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FOR BALANCE OF FOUNDATION TYPICAL DETAILS SEE FO-200 SERIES DRAWINGS

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TYPICAL FOUNDATION DETAILS (HYBRID OPTION)

FO-200 - HYBRID

Vapor Barrier Specifications

SECTION 072616

Integrally-bonded underslab vapor retarder

Florprufe® 120 membrane

PART 1 — GENERAL

1.01 SUMMARY

- A. The Work of this Section includes, but is not limited to, underslab vapor retarder/barrier membrane that forms an integral bond to poured concrete for use below slabs on grade.
- B. Related sections include, but are not limited to, the following:
 - 1. Section 031000 – Concrete Formwork
 - 2. Section 033000 – Cast-In-Place Concrete

1.02 SUBMITTALS

- A. Submit manufacturer's product data, installation instructions and membrane samples for approval.

1.03 REFERENCE STANDARDS

- A. The following standards and publications are applicable to the extent referenced in the text.
- B. American Society for Testing and Materials (ASTM):
 - D 412 Standard Test Methods for Rubber Properties in Tension
 - D 903 Standard Test Method for Peel or Stripping Strength of Adhesive Bonds
 - D 3767 Standard Practice for Rubber - Measurements of Dimensions
 - E 96 Standard Test Methods for Water Vapor Transmission of Materials
 - E 154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover
 - E 1643 Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs
 - E 1745 Plastic Vapor Retarders Used in Contact with Soil or Granular fill under Concrete Slabs
- C. American Concrete Institute (ACI)
 - ACI 302.1R-96 Addendum Vapor Retarder Location: For slabs with vapor-sensitive floor coverings, locate retarder in direct contact with the slab (not beneath a layer of granular fill).

1.04 QUALITY ASSURANCE

- A. Materials: For each type of material required for the work of this section, provide primary materials that are the products of one manufacturer.
- B. Schedule Coordination: Schedule work such that membrane will not be left exposed to weather for longer than that recommended by the manufacturer.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in labeled packages. Store and handle in strict compliance with manufacturer's instructions. Protect from damage from weather, excessive temperature and construction operations. Remove and dispose of damaged material in accordance with applicable regulations.

PART 2 — PRODUCTS

2.01 MATERIALS

- A. Integrally Bonded Vapor Protection: Florprufe® 120 Membrane by GCP Advanced Technologies Construction Products, a 0.5mm (0.021 in) nominal thickness composite sheet membrane comprising 0.4 mm (0.016 in.) of polyolefin film, and layers of specially formulated synthetic adhesive layers. The membrane shall form an integral and permanent bond to poured concrete to prevent vapor migration at the interface of the membrane and structural concrete. Provide membrane with the following physical properties:

PHYSICAL PROPERTIES FOR FLORPRUFE® 120 MEMBRANE:

Florprufe 120 is a Class A vapor barrier and exceeds the requirements as defined by ASTM E 1745

Property	Typical Value	Test Method
Thickness (nominal)	0.5mm (0.021 in)	ASTM D3767 Method A
Water Vapor Permeance	0.03 perms	ASTM E96 Method B *
Tensile Strength	65 lb./in	ASTM E154 *
Elongation	300%	ASTM D412
Puncture Resistance	3300 grams	ASTM D1709 *
Peel Adhesion to Concrete	>4 lb./in	ASTM D903

* ASTM E 1745 Requirements.

PART 3 — EXECUTION

3.01 EXECUTION

- A. The installer shall examine conditions of substrates and other conditions under which this work is to be performed and notify the Contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected.

3.02 INSTALLATION

- A. Earth and stone substrates shall be well compacted to produce an even, solid substrate. Remove loose aggregate or sharp protrusions. Concrete substrates shall be smooth or broom finished and monolithic. Remove standing water prior to membrane applications.
- B. Installation shall be in accordance with manufacturer's instructions and ASTM E 1643–98, including but not limited to, the following:
1. Apply membrane with the HDPE film facing the prepared substrate. Remove the release liner during application.
 2. Apply succeeding sheets by overlapping the previous sheet 50-mm (2 in.) along the marked lap line. End Laps should be staggered to avoid a build up of layers.

Mechanical Fastening Method - To prevent the membrane from moving and gaps opening, the laps should be fastened together at 1.0m (39 in) maximum centers. Fix through the center of the lap area using 12mm (0.5 in) long washer-head self-tapping galvanized screws or similar allowing the head of the screw to bed into the adhesive compound to self-seal. Ensure the membrane lays flat and no openings occur. Additional fastening may be required at corners, details etc.

OR

Taped Lap Method - For additional security use Preprufe® Tape to secure and seal the overlaps. Overband the lap with the 100mm (4in) wide Preprufe® Tape using the lap line for alignment. Remove plastic release liner to ensure bond to concrete.

3. Mix and apply GCP Advanced Technologies liquid detailing compound to seal around penetrations such as drainage pipes, etc.

3.04 CONCRETE PLACEMENT

- A. Place concrete within 30 days. Inspect membrane and repair any damage with patches of Preprufe Tape. Ensure all liner is removed from membrane and tape before concrete placement.

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GCP0083 xxx-xxx-xx16



UNDER-SLAB VAPOR BARRIER

PART 1 – GENERAL

1.1 SUMMARY

- A. Products supplied under this section:
 - 1. Vapor barrier and installation accessories for installation under concrete slabs.
- B. Related sections:
 - 1. Section 03 30 00 Cast-in-Place Concrete
 - 2. Section 07 26 00 Vapor Retarders

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM E1745-17 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
 - 2. ASTM E1643-18a Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
- B. Technical Reference - American Concrete Institute (ACI):
 - 1. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.
 - 2. ACI 302.1R-15 Guide to Concrete Floor and Slab Construction.

1.3 SUBMITTALS

- A. Quality control/assurance:
 - 1. Summary of test results per paragraph 9.3 of ASTM E1745.
 - 2. Manufacturer's samples and literature.
 - 3. Manufacturer's installation instructions for placement, seaming, penetration prevention and repair, and perimeter seal per ASTM E1643.
 - 4. All mandatory ASTM E1745 testing must be performed on a single production roll per ASTM E1745 Section 8.1.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Vapor barrier shall have all of the following qualities:
 - 1. Maintain permeance of less than 0.01 Perms [grains/(ft² · hr · inHg)] as tested in accordance with mandatory conditioning tests per ASTM E1745 Section 7.1 (7.1.1-7.1.5).
 - 2. Other performance criteria:
 - a. Strength: ASTM E1745 Class A.
 - b. Thickness: 20 mils minimum
 - 3. Provide third party documentation that all testing was performed on a single production roll per ASTM E1745 Section 8.1
- B. Vapor barrier products:
 - 1. Basis of Design: Stego Wrap 20-Mil Vapor Barrier by Stego Industries LLC., (877) 464-7834 www.stegoindustries.com.
 - 2. No substitutions.

2.2 ACCESSORIES

- A. Seams:
 - 1. Stego Tape by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
- B. Sealing Penetrations of Vapor barrier:
 - 1. Stego Mastic by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
 - 2. Stego Tape by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
- C. Perimeter/edge seal:
 - 1. Stego Crete Claw by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
 - 2. Stego Term Bar by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
 - 3. StegoTack Tape (double-sided sealant tape) by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
- D. Penetration Prevention:
 - 1. Beast Foot by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
 - 2. Beast Form Stake by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com
- E. Vapor Barrier-Safe Screed System
 - 1. Beast Screed by Stego Industries, LLC, (877) 464-7834 www.stegoindustries.com.
 - 2. Beast Hook by Stego Industries, LLC, (877) 464-7834 www.stegoindustries.com.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Ensure that subsoil is approved by Architect or Geotechnical Engineer.
 - 1. Level and compact base material.

3.2 INSTALLATION

- A. Install vapor barrier in accordance ASTM E1643.
 - 1. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement and face laps away from the expected direction of the placement whenever possible.
 - 2. Extend vapor barrier to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise (a) at a point acceptable to the structural engineer or (b) where obstructed by impediments, such as dowels, waterstops, or any other site condition requiring early termination of the vapor barrier. At the point of termination, seal vapor barrier to the foundation wall, grade beam or slab itself.

[Specifier note: The perimeter seal can be handled several ways. When sealing to the slab, Crete Claw is the best option. When sealing to a stem wall or wall, the best option is to use StegoTack Tape or both StegoTack Tape and Stego Term Bar.]

 - a. Seal vapor barrier to the entire slab perimeter using Stego Crete Claw, per manufacturer's instructions.
 - OR
 - b. Seal vapor barrier to the entire perimeter wall or footing/grade beam with double sided StegoTack Tape, or both Stego Term Bar and StegoTack Tape, per manufacturer's instructions. Ensure the concrete is clean and dry prior to adhering tape.
 - 3. Overlap joints 6 inches and seal with manufacturer's seam tape.
 - 4. Apply seam tape/Crete Claw to a clean and dry vapor barrier.
 - 5. Seal all penetrations (including pipes) per manufacturer's instructions.

6. For interior forming applications, avoid the use of non-permanent stakes driven through vapor barrier. Use Beast Form Stake and Beast Foot as a vapor barrier-safe forming system. Ensure Beast Foot's peel-and-stick adhesive base is fully adhered to the vapor barrier.
7. If non-permanent stakes must be driven through vapor retarder, repair as recommended by vapor retarder manufacturer.
8. Use reinforcing bar supports with base sections that eliminate or minimize the potential for puncture of the vapor barrier.
9. Repair damaged areas with vapor barrier material of similar (or better) permeance, puncture and tensile.
10. For vapor barrier-safe concrete screeding applications, install Beast Screed (vapor barrier-safe screed system) per manufacturer's instructions prior to placing concrete.

END OF SECTION