Subslab Depressurization Systems and Miscellaneous Construction
Bright Outdoors Site – NYSDEC Site No. 7-04-023
Johnson City, New York
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SUBSLAB DEPRESSURIZATION SYSTEMS
and MISCELLANEOUS CONSTRUCTION

1. General

1.1 Introduction

This scope of work (SOW) is a part of the ongoing remediation work at the Bright Outdoors Site (BOS) on behalf of the New York State Department of Environmental Conservation (NYSDEC), Division of Environmental Remediation (DER).

The Scope of Work and Technical Specifications was prepared to describe the work required to install operational subslab depressurization system units and supportive miscellaneous construction at the former Bright Outdoors Site, 631 Field Street, Town of Johnson City, New York, NYSDEC (Site No. 7-04-023). A general site location map is provided as **Figure 1** and construction drawings of the remedial improvements to be installed and constructed are provided as **Drawings 1 and 2**.

Based on analytical information obtained on past groundwater well sampling efforts and subslab air testing in the facility's warehouse and office building, it has been determined that 1,1,1-trichloroethane (TCA) and tricloroethene (TCE) are contaminants of concern in the rear warehouse facility. It has been determined that the remedial action in the rear warehouse of the facility is the installation of subslab depressurization systems (SSDS) under the concrete floor.

The analytical results of the subslab vapor testing program performed in August 2009 are presented in **Attachment A**. The results of a soil vapor extraction (SVE) vacuum pressure test performed in December 2008 are presented in **Attachment B**. The drilling logs for the monitoring wells and soil boring are provided in **Attachment C**.

This SOW is not all-inclusive and is intended to describe only the general requirements of the SSDS unit's installation and the miscellaneous construction requirements. The Contractor shall thoroughly inspect the site prior to submitting costs to be fully acquainted with the Bright Outdoor site's existing conditions. The Contractor shall be responsible for performing all work to make the systems operational whether or not described herein.

If additional work or other equipment and materials that are not listed herein are determined to be required to complete any part of the work, the Contractor will establish the requirements of the additional scope, equipment, time and materials to obtain fully functional and operating systems and discuss with the NYSDEC project manager for final determination and installation.

1.2 Description of the Site

The site location map is shown in **Figure 1**. The former Bright Outdoors site is bordered by Field Street and the New York State (NYS) Route 17 to the south, Innovation Associates and a commercial facility (the Storage Mall) to the east , another commercial facility (Wegman's grocery store) to the north, and residential properties (six) along Marie Street to the west.

The facilities on the property include a former office and general equipment assembly building on the south side of the property facing Field Street and a pre-fabricated metal warehouse building on the north side of the property near the Wegman's parking lot. A roof covered open storage area is located west of the warehouse and north of the assembly / office building.

As indicated in prior studies, the warehouse steel-framed concrete block walled structure approximately 60 feet wide by 160 feet long. The warehouse building is attached to an office/showroom and general equipment assembly building to the south. The warehouse walls are constructed of concrete block with steel columns and trusses on a prepared concrete foundation wall with piers to support the column point loads and uniform wall loads. Access to the warehouse building is from the west side of the property behind the former office and general equipment assembly building. The access into the warehouse building is through mandoors or two rollup garage doors on the west side of the structure. A loading dock is located at the northwest corner of the warehouse also with two roll-up doors. A concrete floor throughout the warehouse is generally six to seven inches thick. A trench drain approximately twelve inches wide, by 12 to 15 inches deep by 60 feet long is located in the middle of the warehouse building. The trench drain is sloped to flow north into a 6 inch discharge pipe to handle the removal of water that would accumulate from dripping from vehicle traffic or building cleanup. The approximate thickness of the concrete floor around the trench drain is 15 inches and six inches throughout the overall warehouse floor area.

1.3 General Scope of Work

1.3.1 The SOW is divided into the following categories:

A. General Project Requirements;

B. Subslab Depressurization System (SSDS) Units;

C. Excavation and Removal - Interior Trench Drain, Selected Flooring for Subsurface Piping, and New Concrete Flooring; and

D. Final Report.

1.3.2 Limited Site Data Information

The Limited Site Data is for informational purposes only and are not part of the Contract work, but are furnished for the Contractor's use. These are located at the end of the Scope of Work document.

The Limited Site Data consists of:

- Subslab Vapor Testing Results **(Attachment A)**
- Soil Vapor Extraction Vacuum Pressure Testing Results **(Attachment B)**
- Interior Building Borehole Logs **(Attachment C)**

1.3.3 Site Specific Scope of Work

The information below provides the specific scope of work and details in performance of the remedial work to be performed.

A. General Project Requirements

The Contractor shall be responsible for coordinating, scheduling, and sequencing all work required as part of this SOW with NYSDEC and current property owner.

1. Work Plan:

    - The Contractor shall prepare and submit a construction installation Work Plan within 10 calendar days after selection and receipt of work order to Contractor by NYSDEC. The Work Plan will be reviewed by the NYSDEC and will either approve the Work Plan, with or without comments, or reject it and require revisions. The work elements in the Work Plan shall include the following:

        – Coordination in performance of the work with the property owner's and/or tenants current on-site activities.

        – A schedule of the work showing the required sequencing, individual work item durations and work item completion dates;

        – An outline of all work elements and activities required to install and operate the SSDS units, including installation of lateral subsurface piping, fan unit mounting and above and below grade piping, electrical connection and unit(s) energizing;

- Installation of new vapor sampling points;
- Excavation of selected concrete floor areas and subsurface soils including around the trench drain, subsurface vapor piping, and outlet trench drain to the lines, grades, and dimensions shown on the drawings;
- Plugging and sealing of north pipe drain inside the warehouse;
- Installation of subslab depressurization system unit(s) including all horizontal and vertical piping and miscellaneous ancillary equipment such as valves, manometers, pipe supports, vent caps, protective shrouds, freeze protection, and electrical connections to obtain fully functional and operational systems;
- Backfill and compact with clean approved granular materials from the bottom of all excavations to within six inches of the existing concrete floor surface;
- Placement of steel load transfer dowels at each location into the existing floor. Dowels placed every five feet around the inside perimeter of the existing concrete floor;
- Installation of pre-molded concrete expansion joint around the inside perimeter of the former trench drain;
- Placement of six inches concrete with 6 inch by 6 inch welded wire fabric. Finish floor to the existing grade of the surrounding floor;
- Seal all new expansion joints with self-leveling expansion joint sealant;
- Repair any floor cracks and control joints in the warehouse to reduce any short-circuiting of air to improve the effectiveness of the subslab depressurization system units;
- Perform the transport and disposal of all site-derived wastes generated including required analysis from the remedial activities including analysis for waste characterization and waste profile approval; and

– Complete post-communication testing and confirmation that the system is operating per the guidance requirements of the NYSDOH. This includes depressurization under the entire warehouse floor slab area to a minimum of 0.004 inches of water column.

2. Other pre- and post-remedial construction submittals including:

- Program work plan outlining the process for warehouse trench floor drain removal, concrete floor repair and sealing, SSDS unit and piping (inlet and outlet) installation, unit(s) energizing, post-communication verification, and project records;
- Health and Safety and Contingency Plan including all staff certifications in performance of the work;
- Product submittals for review and conformance with the technical specifications;
- Location onsite of material storage and waste stockpile staging area;
- All generated waste streams waste profiles;
- Analytical Testing of granular backfill materials;
- Project schedule;
- Materials to be used along with material safety data sheets (MSDS);
- Daily contractor reports and photo-documentation during the decommissioning program; and
- Final report including results of all post construction communication tests, photo-documentation, manifests, bills of lading, record drawings, and disposal certifications of all waste streams from the disposal facilities.

3. Health and Safety Plan (HASP):

- Submit a comprehensive, signed Health and Safety Plan (HASP) and Contingency Plan to the NYSDEC 10 days prior to initiating field activities. If modifications or clarifications to the Plan are required to comply with 29 CFR 1910.120, these must be made before the start of field activities.

- Designate a responsible person or site safety officer (SSO) for compliance of their HASP while performing the on-site work;

- Perform all site activities using a minimum of Level D PPE (including at a minimum hard hat, safety glasses, neoprene gloves, and steel-toed boots and may also include Tyvek® and/or Saranex® if conditions warrant);

- Performance of work activities in cold and warm weather conditions;

- Provide PPE upgrades (Level C or higher) which shall be available on Site; and

- Submit evidence that all field personnel are HAZWOPER trained including medical fitness and that all certificates of training are current with the last 12 months.

4. Permits:

- The Contractor shall obtain all necessary permits, insurance (property owner as additionally insured), and licenses required to complete all work, and pay all fees necessary to obtain these permits.

5. Daily Reporting by the Contractor:

- Project Supervisor shall prepare and submit daily reports describing;

    - Name, address and telephone number of contractor;
    - Date;
    - Time of arrival at and time of departure from the site of all staff;
    - Weather conditions AM and PM including temperature, wind direction and approximate speed; cloud cover
    - The activities performed each day;
    - Names of employees;

- Minutes of safety meeting;
- Equipment used;
- Materials expended;
- Samples taken and disposition;
- Description of materials, equipment or wastes disposal and disposal firm name, address and telephone number;
- Photographs taken with a description;
- List of site visitors and their company affiliation; and
- Signature, title and printed name of site supervisor.

6. Photographs:

- Use a digital camera of the type acceptable to the NYSDEC to obtain 10 to 15 photographs of representative items of work. Describe the photograph in specific terms.

7. Utility Clearance:

- The Contractor shall verify all utility locations around and inside the building prior to initiating any intrusive subsurface activities.

8. Mobilization - Demobilization:

- The Contractor shall mobilize all necessary equipment, materials, and supplies to the site at the beginning of the project; and

- The costs associated with mobilization to and demobilization from the Site, including travel, per diem, etc., if any, are to be included in this task.

9. Other Contractor responsibilities:

- Implementing any noise control measures according to the property owner or local codes and regulations and as directed by NYSDEC;

- Storing contaminated materials and debris generated by the Contractor in a secure storage location or rolloff onsite. No equipment or contaminated materials shall be left in an unsecured area overnight or on weekends. There will be no locked equipment staging areas provided by NYSDEC. The NYSDEC does not accept any responsibility for any equipment left on site;

- Performing all miscellaneous site restoration activities and demobilizing from the site;

- Obtaining approval from the NYSDEC for the general sequence of Work activities;

- Performing all work during 8-hour workdays on a 5-day per week work schedule or per the schedule requirements of the property owner;

- Work shall not be conducted on weekends or scheduled holidays; and

- Disposing of all debris and materials removed from the trench drain removal and SSDS unit(s) subgrade piping installation.

10. Construction Schedule

- Submit a construction schedule in a Gantt chart or Microsoft Project format for review and acceptance by the NYSDEC PM; and

- Where significant schedule changes occur, revise and resubmit as requested.

- Coordinate construction activities, utility shutdowns, and daily work schedules with the current operations of the property owner and/or tenants.

B. Subslab Depressurization System (SSDS) Units

The site-specific Scope of Work is as follows:

1.0 - General

1.1 – New Vapor Points Installation

- Installation of two new vapor testing points at the approximate locations on the construction drawings **(Drawings 1 and 2)** and accordance with the technical specifications.

- Provide a location map with all vapor sampling point locations and a report on the differential pressure results of each after the post-construction communication testing is performed.

- Provide information based on visual inspection and observation on areas within the facility where differential pressure short circuiting along with any floor cracks or control joints, or subsurface utility piping that need to be repaired or sealed to improve differential pressure communication throughout the warehouse floor.

- Evaluate the heating and ventilation systems of the warehouse buildings along with the facility garage and mandoor openings. Evaluate how the operations of these building systems and openings may affect the differential pressure effectiveness of the operating SSDS units.

- Indicate where possible active electrical connections will be made in the building to energize the SSDS units.

1.2 – Subslab Depressurization System Units

- Coordinate the SSDS unit installations with the concrete floor, trench drain removal and horizontal vapor piping installation.

- Install complete SSDS units and ancillary equipment that will maintain a minimum negative pressure of 0.004 inches of water column throughout the entire floor of the warehouse.

- Construct and install subsurface horizontal vapor collection piping, SSDS units and vertical piping as indicated on the drawings.

- Coordinate electrical activation of the SSDS units with property owner and any tenants as not to disrupt electrical service from daily onsite work activities.

1.3 Submittals

- Product submittals for review and conformance with the Scope of Work.

- Subslab depressurization system installation plan.

- Map of subslab post-construction communication testing results.

- Provide information on areas of short circuiting of negative pressure or other improvements needed.

- Location of possible electrical connections.

2.0. Products

2.1 Vapor Points

- Vapor testing point materials or equal and installation per approximate locations and details on **Drawing 1.**

A) Vapor point piping and fittings
   1. Swagelok Company, Solon, OH
   2. McMaster – Carr, Inc., New Brunswick, NJ
   3. Or – equal.

B) Hydraulic Cement
   1. UGL DryLok – Fast Plug, UGL Industries, Scranton, PA
   2. Or – equal.

C) Bentonite
   1. Ben-Seal Hydrated Bentonite, Baroid Industrial Drilling Products, Houston, TX
   2. Or – equal.

2.2 SSDS Units, Piping and Fittings and Ancillary Equipment

A) Pipe - Schedule 40 PVC, 6 inch ID, color - white, service temperature 33-140 degrees F, ASTM D-1784 – Type 1, and NSF listed and Schedule 80 CPVC, 6 inch ID, color - gray, service temperature 200 degrees F., ASTM D1784 – Type 1 and NSF listed.
   1. Solid PVC pipe – (Schedule 40 PVC and 80 CPVC at selected locations)
      a. Harvel Plastics, Inc., Easton, PA
      b. Or - equal.
   2. Well screen pipe - 0.010 slot – plain joint – 6 inch ID, Schedule 40 PVC
      a. Buffalo Well Products, Clarence, NY
      b. Or – equal

B) Fittings (tees, elbows, couplings, end caps – Schedule 40 PVC or Schedule 80 CPVC, white or gray, 6 inch ID, Service temperature to 200 degrees F., ASTM D-1784 – Type 1, and NSF listed.
   1. Lasco Fittings, Inc., Brownsville, TN
   2. Or-equal.

C) Flexible Couplers or Connectors, 6 inch ID, Service temperature to 140 degrees F., and UPC Approved.
   1. Fernco, Inc, Davison, MI - Series 1056
   2. Or-equal.

D) Pipe Supports and Stand-offs 6 inch ID
   1. RadonAway, Ward Hill, MA
   2. Or-equal.

E) Fans (including moisture bypass freeze protection)
   1. RadonAway, Ward Hill, MA – Series RP Model 265
   2. Or-equal

F) Valves
   1. Slide or Knife gate valves – full flow design with unrestricted flow
      a. Valterra Products, Inc., Mission Hills, CA
      b. Praher Valves, Barrie, Ontario, Canada
      c. Or-equal

G) Ancillary SSDS Equipment – U-tube manometers (if needed)
   1. Vacuum or suction Indicators or Differential Pressure Manometers – gauge oil is non-hazardous
      a. Vacumeter by Vacu-ray
      b. Dynameter by RadonAway, Ward Hill, MA
      c. Or-equal

H) Outdoor Fan Covers and Base plate – durable and paintable ABS plastic – black or white (as needed)
   1. RadonAway, Ward Hill, MA
   2. Or-equal

I) Condensation / Freeze Protection By-pass
   1. RadonAway, Ward Hill, MA
   1. Or-equal

J) Roof Caps – Tee with varmint guard – 6 inch
   1. RadonAway, Ward Hill, MA
   2. Or-equal

K) Cements and Sealants – odorless, nontoxic, non-flammable, environmentally safe
   1. Gorilla PVC cement, Hollywood, FL
   2. Or-equal

2.3 Geo – Fabric Materials

A) Geo-fabric Trench Liner
   1. Hancor Inc., Findley, OH
   2. Or – equal

B) Polypropylene Drainage Board
1. SonoShield DBS 9000, BASF Building Systems, Shakopee, MN.
2. Or-equal

2.4 Floor Drains (if needed)

A) Floor drains
a. Dranjer D-F-J series
b. Or-equal

2.5 Floor Patches

A) Concrete - Strength – 4000 psi at 28 days
a. Local ready mix from an approved NYSDOT batch plant

2.6 Urethane Crack Sealers

A) Sealtight Safe-seal 3405, W.R. Meadows, Hampshire, IL
B) Pecora Dynatrol Sealant, Pecora Corp., Harleyville, PA
C) Or-equal

3.0 Execution

3.1 Vapor Point Installation

- Install the two new vapor test points at the approximate locations and details as shown on **Drawing 1**.

- Review and report all areas where excess air could short circuit into the system that could reduce unit efficiency.

3.2 General SSDS Requirements and Initial Inspections

- Perform a pre-inspection of each location where a SSDS is to be installed to review the current building constraints, conditions, utility requirements, stored materials, and relocation of moveable objects to properly install each SSDS unit.

- Coordinate with the property owner and/or tenants the shutdown, shutoff, testing, and return to services of all utilities to be affected by the installation of the SSDS units.

- Where portions of the exterior block wall must be removed to accommodate vent piping, the block wall removed shall be no greater than that permitted for plumbing installations by applicable New York State (NYS) and National building or plumbing codes.

- Where installation of the SSDS unit requires pipes or ducts to penetrate a firewall or other fire resistance rated wall or floor, penetrations shall be protected in accordance with applicable New York State (NYS) and National building, mechanical, fire, and electrical codes.

- Where combustible materials exist in the specific area of the building where vapor mitigation work is to be conducted, and the Contractor is creating temperatures high enough to induce a flame, the Contractor shall ensure that fire extinguishers suitable for type A, B, and C fires are available in the immediate work area.

3.3 Warehouse Floor Removal and Granular Fill for Subsurface Vapor Piping

- Requirements for flooring removal for trench drain and subsurface SSDS piping are located in Section C of the SOW.

3.4 SSDS Venting and Exhaust Pipe Installation Requirements

3.4.1 Above and Below Grade Installation

- Install all piping and fittings per the manufacturer's recommended instructions.

- Core drill all holes for carrier piping through the concrete block exterior wall.

- All interior vertical piping above the floor grade and before exiting through the block wall shall be installed with schedule 80 CPVC pipe and fittings. All other system piping will consist of schedule 40 PVC piping and or fittings.

- All joints and connections in subslab depressurization units using plastic vent pipes shall be permanently sealed with adhesives as specified by the manufacturer of the pipe material used. Joints or connections in other vent pipe materials shall be made airtight.

- Vent piping (vertical) shall be fastened to the structure of the building with pipe hangers, or other supports that will adequately secure the vent material according to the manufacturer's installation instructions. Existing plumbing pipes, ducts, or mechanical equipment shall not be used to support or secure a vent pipe.

- Supports for vent pipes shall be installed at least every six feet on above grade horizontal runs or as recommended by the manufacturer. Vertical runs shall be secured either above or below the points of penetration through floors, ceilings, and roofs, or at least every eight feet on runs that do not penetrate floors, ceilings, or roofs as recommended by the manufacturer.

- Where units are located in covered areas and runs through a second roof (adjacent covered storage area west of the warehouse), all roofing penetrated shall be watertight after completion of the exhaust venting of the SSDS unit to the required height above the roof line.

- Vent pipes shall be installed in a configuration that ensures that any rain water or condensation within the pipes drains downward into the ground beneath the slab.

- Install geo-fabric in the bottom, sides and top of the vapor collection area to receive the well screen and clean granular stone.

- After pipe and well screen installation, backfill with required clean graded stone (no fines) to the required depth and compact and cover the top with the geo-fabric.

- Install polypropylene drainage board (SonoShield) on top of the geo-fabric screened vapor collection point prior to placement of the concrete. Cut the material to fit the dimensions required.

- Vent pipes shall not block access to any areas requiring maintenance and inspection and general ingress and egress from each installation location. Vents shall not be installed in front of or interfere with any light, opening, door, window or equipment access area required by code. If vent pipes are installed in sump pits, the system shall be designed with removable or flexible couplings to facilitate removal of the sump pit cover for sump pump maintenance.

- To prevent re-entrainment of vapors, the point of discharge from vents of fan-powered soil depressurization and block wall depressurization systems shall meet all of the following requirements: (1) be 18 -24 inches above the eave of the roof, (2) be ten feet or more above ground level, (3) be ten feet or more from any window, door, or other opening into conditioned spaces of the structure that is less than two feet below the exhaust point, and (4) be ten feet or more from any opening into an adjacent building. The total required distance (ten feet) from the point of discharge to openings in the structure may be measured either directly between the two points or be the sum of measurements made around intervening obstacles. Whenever possible, the exhaust point should be positioned above the highest eave of the building and as close to the roof ridge line as possible.

- The vent pipe and pickup points shall be sized to maximize the efficiency of pickup of vapor below the slab and velocity of flow throughout the entire system or per the manufacturer installation instructions.

- Install the inline slide or knife-gate valves per the manufacturer's installation instructions.

- Inline slide or knife -gate valves shall be installed for each suction point to modulate air flows and maximize efficiency and to balance the depressurization throughout the floor area.

- Install slide-gate valves at point locations to isolate system problems without shutting down the entire system. Slide-gate valves shall be set after energizing the system(s) to maximize the depressurization or to equalize the depressurization throughout the system. The system should not operate as to cause back-draft conditions with other utility systems throughout the area of system installation.

- Upon setting the vacuum based on the final and acceptable post-construction commissioning testing, the slide or knife- gate valves shall be set or locked based on the readings on the individual vacuum manometers.

- Cleaning solvents and adhesives used to join plastic pipes and fittings shall be as recommended by manufacturers for use with the type of pipe material used with the assembly of the SSDS.

- The exterior exhaust vent above the roof line for the system shall have a tee or rodent/bird prevention cap installed with vent.

3.5 Vent Piping - Ancillary Equipment installation.

- Install vacuum tube ("U-tube" manometers) or suction indicators at the main suction points inside the building and before the fan to visually observe if the differential pressure is being reached to the minimum limits required by the NYSDOH regulations.

- Install system labeling regarding general system operations and emergency phone contacts in case system shutdown occurs. These labels will be provided to the Contractor from NYSDEC PM.

3.6 Vent Fan Installation Requirements

- Install the SSDS fan units per the manufacturer's recommended instructions.

- Vent fans used in the SSDS shall be designed or otherwise sealed to reduce the potential for leakage of soil gas from the fan housing.

- Vent fans shall be sized to provide the pressure difference and air flow characteristics necessary to achieve a net flux of air from above the warehouse slab to beneath the warehouse slab. This is the basis of the initial sub-slab vacuum test.

- Vent fans shall be installed and mounted on the exterior of the building. Where possible the piping for the venting system shall exit through the warehouse's concrete block wall. The holes through the buildings block wall shall be cored.

- Vent fans shall be installed in a configuration that avoids condensation buildup in the fan housing. Fans should be installed in vertical runs of the vent pipe. A by-pass freeze protection and condensate drain shall be a part of the fan installation.

- Vent fans mounted on the exterior of buildings shall be rated for outdoor use or installed in a water tight protective housing or shroud.

- Vent fans shall be mounted and secured in a manner that dampers and minimizes transfer of vibration to the structural framing of the building.

- The fan units should be mounted at a height for ease and accessibility for future maintenance from ground level without the use of ladders or scaffolds.

- To facilitate maintenance and future replacement, vent fans shall be installed in the vent pipe using removable couplings or flexible connections that can be tightly secured to both the fan and the vent pipe.

- Install the fan cover or shroud (as needed) to maximize the protection of the vent fan from outdoor weather effects. Install around the fan housing and attach to the building per the manufacturer's installation instructions.

3.7 Supplemental Requirements for Subslab Depressurization Systems

- Sump or utility pits that permit entry of soil-gas or that would allow conditioned air to be drawn into a sub-slab depressurization system shall be covered and sealed. The covers on sumps that previously provided protection or relief from surface water collection shall be fitted with water or mechanically trapped drain.

- Openings around vent pipe penetrations of the slab and the foundation walls, shall be cleaned, prepared, and sealed in a permanent, air-tight manner using compatible caulks or other sealant materials. Openings around other utility penetrations of the slab, walls, or soil-gas retarder shall also be sealed.

- Openings, perimeter channel drains, or cracks that exist where the slab meets the foundation wall (floor-wall joint), shall be sealed with urethane caulk or equivalent material. When the opening or channel is greater than 1/2 inch in width, a foam backer rod or other comparable filler material shall be inserted in the channel before application of the sealant. This sealing technique shall be done in a manner that retains the channel feature as a water control system. Other openings or cracks in slabs or at expansion or control joints should also be sealed. Openings or cracks that are determined to be inaccessible or beyond the ability of the Contractor to seal shall be disclosed to the NYSDEC PM and included in the final documentation report.

3.8 Electrical Requirements

- Wiring for the SSDS units and other ancillary equipment shall conform to provisions of the National Electrical Code and any additional NYS and local regulations or permits.

- An electrical disconnect switch or circuit breaker shall be installed for each SSDS fan unit to permit deactivation of the fan(s) for maintenance or repair by the building owner or servicing Subcontractor.

- Coordinate all electrical and mechanical equipment shutdowns and tests with the current property owner or tenant.

- Install the electrical system so as to be able to isolate each system without interruption to other utilities or tenants on the property.

- Upon completion of commercial property installations, an independent UL inspection shall be performed to document the acceptance of the new electrical installation(s).

3.9 Patching and Sealing of Floor Cracks and Control Joints

- Install all patching materials and sealants per the manufacturer's installation instructions.

- When sealing holes for plumbing rough-in or other large openings in slabs that are below the ground surface, non-shrink mortar, grouts, or similar materials designed for such application shall be used.

- When concrete is to be used, the area shall be reviewed first for elevation differential issues. Ideally, where undesirable subbase materials can be excavated to maintain consistent floor elevations, that option would be accepted first. Excavated materials shall be disposed of as non-hazardous solid wastes.

- When sealing cracks in slabs, control joints, and other small openings around penetrations of the slab and foundation walls, caulks and sealants designed for such application shall be used. Urethane sealants are recommended because of their durability.

- For consistent elevation situations where only concrete patching is required, a minimum of 1 inch of subbase stone should be installed under a minimum of 4 inches of concrete on flooring patching applications.

- For alternate situations, where new flooring installation cannot maintain consistent elevations these will be discussed and evaluated prior to installation.

3.10 Movement of Equipment and Materials and Temporary Storage

- Coordinate all movement of equipment and materials at each location with the property owners and/or tenants to properly install each system.
- Photo-documentation shall be provided where it is necessary to justify current conditions of the materials and equipment that is required to be moved and upon return.

- Minimize the amount of equipment and materials to be moved and stored by further inspection of the layout and route of the system.

- Provide safe and dry protection of all equipment and materials during the SSDS unit installation and upon return.

3.11 Vapor Control Floor Drains (if needed)

- Vapor control floor drains shall be made of durable metal or other rigid material and designed to permit air-tight sealing. To permit easy removal for sump pump servicing, the cover shall be sealed using silicone or other non-permanent type caulking materials or an air-tight gasket.

- Install vapor control floor drain in accordance with the manufacturer's instructions.

- Seal all connections to the vapor retardant floor drain unit and the surrounding concrete flooring.

- Install the floor drainage unit to provide positive drainage into the drain from all areas. No build-up of drainage from installation of the new unit shall be allowed.

- For consistent floor elevation on holes to be filled, install bedding stone to within four inches of the existing surface and compact. Place four inches of concrete and trowel finish.

- For alternate situations, where new flooring installation cannot maintain consistent elevations these will be discussed and evaluated prior to installation.

3.12 Project Cleanup and Operations

- Provide daily cleanup of all work areas due to continuous activities in those functional spaces by the property owners and/or tenants.

- In areas of commercial property activities, the Contractor shall be concerned with protection of sensitive (such as food, computers, etc.) items in the facility from dust and debris resulting from installations.

- Coordinate all project related work activities and protection of these sensitive items with the property owners and tenants at each location prior to installation and on an on-going basis.

- In case of potential claims, the Contractor shall perform photo documentation prior to installation and upon completion of the system installation.

3.13 Transport and Disposal of Wastes and Project Debris

- A certificate of proper disposal shall be provided from the landfill facility to document final disposal of the waste stream.

- Only excavated wastes and debris associated with the installation of each SSDS unit, subsurface piping, and ancillary improvements shall be transported and disposed.

3.14 System Post-construction Commissioning Testing and Back-draft Checks

- After installation, re-examine and verify the integrity of the fan mounting seals and all joints in the interior vent piping.

- After installation, measure suctions or flows in system piping or ducting to assure that the system is operating as designed. A test of pressure field extension shall be performed. Upon completion of installation, operate the systems for a minimum of 4 hours. After this period, use the vapor points to test the vacuum achieved at this test hole by attaching, using tubing sealed air-tight at the slab and a vacuum meter or micro-manometer. A minimum of one Pascal (0.004 inches of water column) will be achieved at these of these vapor monitoring points. If insufficient vacuum is observed, the Contractor may exercise its option to install additional suction point(s) and plumb into the depressurization system. The system commissioning testing shall then be performed a second time or until the required vacuum level is achieved.

- Immediately after installation in buildings containing natural draft combustion appliances, the building shall be tested for back-drafting of those appliances. Any back-drafting condition that results from installation of the subslab depressurization unit shall be corrected before the system is placed in final operation.

3.15 Installation Record Drawings and Equipment Warrantees

- Upon completion and acceptance of the work, the Contractor will provide one complete record drawing of the schematics of the system installation including all mechanical piping, mechanical equipment, electrical connections, and any significant installation changes for each separate individual location provided under the scope of work.

- Record drawings for each location shall be submitted two (2) weeks after substantial completion acceptance of the system to the Contractor.

- Record information shall include all individual equipment warranty information and operating and maintenance instructions provided by the equipment manufacturer.

- Provide individual record information regarding all final post-construction communication and backdraft test results for each location.

- The Contractor shall also provide individual daily reports of the work performed at each installation location. These shall include names of the staff performing the work, work performed, equipment used, and issues encountered during the installation.

3.16 Correction Period

- If, within (12) twelve months after final completion of the work and acceptance by the NYSDEC's site representative, any installed item of equipment or designated part of the work that is found to be defective, the Contractor shall promptly, without an adjustment in price, either correct such defective work or replace the item with work that conforms to the scope of work.

- Installation of subslab depressurization units based results of post-construction communication testing.

C. Excavation and Removal - Interior Trench Drain, Selected Flooring for Subsurface Piping, and New Concrete Flooring

The contractor shall excavate and remove the interior concrete trench drain, soils and selected concrete floor in the warehouse to allow installation of the SDSS units piping and ancillary equipment. This section includes decommissioning and plugging all ancillary piping associated with the trench drain discharge pipe, and installation of new concrete flooring

1.0 General

1.1 Excavation Work to be Performed

- Perform a pre-inspection of each location where excavation work is to be installed to review the current building constraints, conditions, utility requirements, stored materials, and relocation of moveable objects to perform excavation work.

- Saw cut the concrete floor full depth around the trench drain and perform excavation for the new SSDS subgrade piping to the dimensions and grades shown on the construction drawings (**Drawings 1 and 2**). It is unknown if welded-wire fabric or wire reinforcing was installed is in the existing concrete floor.

- Remove the trench drain discharge piping three feet beyond the former trench drain and plug the effluent discharge with a pipe plug and seal with concrete.

1.2 New Flooring Installation

- Prepare the subgrade after excavation to receive the SSDS subgrade piping or selected granular materials for the excavated trench drain, vapor collection areas, and subsurface horizontal SSDS piping.

- Compact granular materials around new piping and up to the underside of the depth of the new six inch concrete flooring.

- Provide steel dowels at the locations and dimensions (**Drawings 1 and 2**) into existing concrete flooring to provide load transfer from the old floor to the new.

- Provide concrete expansion joint materials to adjoin all new and existing concrete floors as a part of the construction.

- Install new welded wire fabric in all floor areas where new concrete will be placed.

- Place concrete to the depths, dimensions, and locations excavated as shown on the drawings.

- Install self-leveling expansion joint sealant per the manufacturer's instructions.

- Install joint sealant at all new concrete joints to reduce any vapors from entering into the warehouse or short circuiting of ambient air into the vapor collection system.

1.3 Excavated Waste Removals

- Stockpile excavated concrete and subgrade spoil materials away from the work area or place in rolloff containers so as not to conflict with any other ongoing work of the Contractor or the Owner/tenants.

- Sample the excavated soils and debris according to the requirements of TAGM 4046.

- Prepare waste profile for acceptance by the accepted transport and disposal firms and obtain disposer acceptance.

- Transport and dispose soils and construction and demolition debris.

- Provide completed manifest or bill of lading and or certificate of disposal in the final project report.

1.4 Submittals

- Analytical results from testing of soils and construction demolition debris.

- Analytical results of new granular backfill.

- Products as listed for approval of use.

- Concrete testing results.

- Disposal location for acceptance.

- Completed manifests and certificate of final disposal.

2.0 Products

2.1 Floor concrete

A) Concrete - Strength – 4000 psi at 28 days
   a. Local ready mix from an approved NYSDOT batch plant

2.2 Load Transfer Stainless Steel Doweling

A) Low-carbon ¾ inch smooth (plain) stainless steel dowels – epoxy-coated – ASTM Standard A955-09 – Standard Specification for Deformed and Stainless Steel Bars for Concrete Reinforcement, Class A, Type 1 or 2

B. Dowel Lubricant – Paraffin based lubricants
   1) Dayton Superior DSC BB-Coat, Dayton Superior Corp., Dayton, OH.
   2) Valvoline Tectyl 506
   3) Or - equal

2.3 Welded Wire Fabric

A) 6 inch by 6 inch pattern welded wire fabric for concrete reinforcing, ASTM standard – A884-02 – Standard Specification for Epoxy–coated Steel Wire and Welded Wire Fabric for Reinforcement.

2.4 Concrete Expansion Joint Materials

A) ½ inch, ASTM Standard – D994 – Standard Specification for Preformed Expansion Joint filler for Concrete (Bituminous type)

2.5 Expansion Joint Sealant

A) Novalink SL, Self-leveling Expansion Joint Sealant, Chem Link Inc., Schoolcraft, MI

B) Or- equal

2.6 Geo – fabric

A) Geo-fabric Trench Liner
   1. Hancor Inc., Findley, OH
   2. Or – equal

B) Polypropylene Drainage Board
   1. SonoShield DBS 9000, BASF building Systems, Shakopee, MN.
   2. Or-equal

2.7 Granular Stone Fill

A) Granular fill – Trench Drain and Horizontal Vapor Piping (0'-28')
1. NYSDOT 703-02 Coarse Aggregate – Table 703-4 – Sizes of Stone, Gravel and Slag – Screen size 1½" with fines.

B) Granular fill – Horizontal Vapor Piping (28' – 31.5')
1. NYSDOT 703-02 Coarse Aggregate – Table 703-4 – Sizes of Stone, Gravel and Slag – Screen size 2½" with minimal fines.

3.0 Execution

3.1 Excavation – Concrete Floor and Subgrade Materials

- Full depth saw cut of concrete floor where the trench drain is to be removed and the subsurface horizontal vapor collection piping is to be installed.

- Excavate the concrete floor and subgrade materials from the trench drain and horizontal vapor piping to the lines and grades as shown on the drawing.

- Perform all excavation work at the established lines and grades so as not to create disturbed or uncompacted subgrade areas where existing or concrete flooring is not supportive for placement of new concrete flooring.

- Prepare the subgrade per the lines and grades on the drawing to received the new granular fill and/or vapor piping.

- Store the excavated concrete flooring materials and subgrade soils in an acceptable and approved location on site or in roll-offs for future off-site disposal.

- Install geo-fabric in the select vapor extraction locations prior to installing the vapor extraction piping and select clean granular materials.

- Install per the manufacturer's instructions, the polypropylene drainage board on top of the geo-fabric screened vapor collection point prior to placement of the concrete. Cut the materials to fit the opening.

3.2 Granular Fill and Compaction

- Once geo-fabric and vapor piping installation is complete, backfill with the required select clean select granular materials and compact around the sides of the piping and to the under side of the new concrete flooring.

- Compact all areas of granular materials with a minimum of 95% compaction using ASTM Method D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort.

3.3 Concrete Flooring Replacement (Trench Drain and Subsurface Horizontal Vapor Piping)

- Review prepared compacted subgrade to receive concrete.

- Install the new load transfer dowels into the sawcut face of the existing concrete floor to the lines and grade shown on the drawing.

- Install the ¾ inch stainless steel dowels into the existing concrete floor of the former trench drain every five feet around the perimeter of the concrete floor of the former trench drain per the construction drawings.

- Install by ¾ inch stainless steel dowels into the existing concrete floor where the vapor piping was installed every five feet around the perimeter of the concrete floor for the horizontal piping trench except at the vapor point collection location. Installation is every 2 feet.

- Lubricate the end of the dowel inserted into the existing concrete floor.

- Install concrete expansion joint materials onto the sawcut face of the existing concrete flooring for the former trench drain and the horizontal vapor piping trench.

- Place and secure 6 inch by 6 inch welded wire fabric in the floor areas that new concrete is to be placed.

- All concrete to be placed shall be protected that the temperature at the surface will not fall below 50 degrees F for three days after placement.

- Place concrete in the prepared subgrade floor areas protecting the space above the expansion joint.

- The new concrete shall match the existing flooring grades throughout the warehouse facility.

- All new flooring shall be finished to a hard smooth surface with a steel trowel then finish to match the existing surface.

- After curing of the concrete install the self-leveling expansion joint sealant per the manufacturer's installations requirements.

- Concrete physical testing – Take four cylinders for testing per placement of every 50 cubic yards or every day of concrete placement. Perform testing of one cylinder at 14 days and cylinders 2 and 3 at 28 days. The fourth cylinder to be held and tested in case compression strength issues are encountered. Use ASTM Standard C31-09 for curing the test specimens in the field.

- Provide physical testing information to the NYSDEC upon receipt of the report and include in the final report.

D. Final Report

1.0 General

1.1 Final Report

- The final report shall be prepared and delivered two weeks after completion of all work.

- The report shall be issued draft to the NYSDEC PM for review and comments before finalization.

- The report should include the following:
  1. Results of post-construction communication tests and floor repairs;
  2. Photo-documentation prior to construction;
  3. Record drawings of the final installation including equipment installed;
  4. Any product or equipment warrantees received from the manufacturers;
  5. Physical testing results of all concrete;
  6. Manifests, bills of lading, and disposal certifications of all waste streams delivered for off-site disposal;
  7. Contractor Daily reports;
  8. Copies of any permits obtained; and
  9. Inspection and certification from the Underwriters Laboratory (UL) regarding any new electrical equipment and connections made to the facility.

- Submit two electronic copies of the final report once the comments to the report are finalized.

2.0 Products

None

3.0 Execution

None

End of the SOW

Subslab Depressurization Systems and Miscellaneous Construction
Bright Outdoors Site – NYSDEC Site No. 7-04-023
Johnson City, New York
January 2010
(002700.DC21.02)

Limited Site Data Information

Attachment A

August 2009
Subslab Vapor Testing Results

Table 3-3
Summary of Positive Analytical Results for Sub-slab Soil Vapor Samples, Former Bright Outdoors Site

Analyte / Sample ID: / Date:	FBO-SS-101 8/27/09	FB0-SS-102 8/27/09	FBO-SS-103 8/27/09	FBO-SS-104 8/27/09
VOCs in Air (µg/m³)				
1,1,1-Trichloroethane	4700	23000	3500	4100
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.77 U	7.7 U	2.4	6.7
1,1-Dichloroethane	0.4 U	75	43	6.8
1,1-Dichloroethylene	0.56	4 U	0.54	0.4 U
1,2,4-Trimethylbenzene	0.51	4.9 U	1.5	1.7
1,3,5-Trimethylbenzene	0.49 U	4.9 U	0.51	0.58
1,4-Dichlorobenzene	0.6 U	6 U	0.6 U	0.6 U
2-Butanone (MEK)	3.4	5.9 U	5.7	13
2-Hexanone (MBK)	0.82	4.1 U	1.5	1.8
4-Ethyltoluene	0.49 U	4.9 U	0.49 U	0.49 U
4-Methyl-2-pentanone (MIBK)	0.93	4.1 U	48	6.1
Acetone	20	9.5 U	24	46
Benzene	0.61	3.2 U	1.9	1.4
Bromodichloromethane	0.67 U	6.7 U	0.91	1
Bromoform	1 U	10 U	1 U	1 U
Carbon Disulfide	1.5	3.1 U	6.7	8.2
Carbon Tetrachloride	0.63 U	6.3 U	0.63 U	0.63 U
Chloroform	0.64	4.9 U	1.5	8.8
Chloromethane	0.21 U	2.1 U	0.24	0.21 U
Cyclohexane	0.34 U	3.4 U	0.87	0.76
Dibromochloromethane	0.85 U	8.5 U	0.85 U	0.85 U
Dichlorodifluoromethane (Freon 12)	2.9	4.9 U	2.3	3.3
Ethanol	2.7	7.5 U	3.3	4.8
Ethyl Acetate	0.36 U	3.6 U	0.76	0.36 U
Ethylbenzene	0.43 U	4.3 U	0.74	0.57
Heptane	0.41 U	4.1 U	1.7	0.85
Hexane	0.58	3.5 U	1.8	1
Isopropanol	1.6	4.9 U	1.5	2.5
m&p-Xylene	0.87 U	8.7 U	2.8	1.9
o-Xylene	0.43 U	4.3 U	1.1	0.93
Styrene	0.43 U	4.3 U	0.43 U	0.43 U
Tetrachloroethylene	2.3	6.8 U	7.4	1.1
Tetrahydrofuran	0.29 U	2.9 U	0.29 U	0.29 U
Toluene	0.84	3.8 U	4	2.7
Trichloroethylene	96	5.4 U	1.5	5.8
Trichlorofluoromethane (Freon 11)	30	7.3	12	19

Key:

J = Estimated value.

U = Non detected,

mg/L = Milligrams per liter.

µg/L = Micrograms per liter.

Table 3-3
Summary of Positive Analytical Results for Sub-slab Soil Vapor Samples, Former Bright Outdoors Site

Analyte / Sample ID: / Date:	FBO-SS-105 8/27/09	FBO-SS-106 8/27/09
VOCs in Air (µg/m³)		
1,1,1-Trichloroethane	11000	3.4
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	7.7 U	0.77 U
1,1-Dichloroethane	28	0.4 U
1,1-Dichloroethylene	27	0.4 U
1,2,4-Trimethylbenzene	4.9 U	1.1
1,3,5-Trimethylbenzene	4.9 U	0.59
1,4-Dichlorobenzene	6 U	0.6 U
2-Butanone (MEK)	11	7.4
2-Hexanone (MBK)	4.1 U	1.8
4-Ethyltoluene	4.9 U	0.49 U
4-Methyl-2-pentanone (MIBK)	4.1 U	1.2
Acetone	29	23
Benzene	3.2 U	1.5
Bromodichloromethane	6.7 U	0.67 U
Bromoform	10 U	1 U
Carbon Disulfide	6.7	4.1
Carbon Tetrachloride	6.3 U	0.63 U
Chloroform	5.6	0.49 U
Chloromethane	2.1 U	0.22
Cyclohexane	3.4 U	0.98
Dibromochloromethane	8.5 U	0.85 U
Dichlorodifluoromethane (Freon 12)	4.9 U	2.1
Ethanol	7.5 U	2.4
Ethyl Acetate	3.6 U	0.36 U
Ethylbenzene	4.3 U	0.65
Heptane	4.1 U	2.7
Hexane	3.5 U	2.3
Isopropanol	4.9 U	0.93
m&p-Xylene	8.7 U	2.6
o-Xylene	4.3 U	0.85
Styrene	4.3 U	0.43 U
Tetrachloroethylene	260	0.68 U
Tetrahydrofuran	2.9 U	0.29 U
Toluene	3.8 U	3.1
Trichloroethylene	15	110
Trichlorofluoromethane (Freon 11)	5.6 U	1.1

Key:

J = Estimated value.

U = Non detected.

mg/L = Milligrams per liter.

µg/L = Micrograms per liter.

Table 3-3
Summary of Positive Analytical Results for Sub-slab Soil Vapor Samples, Former Bright Outdoors Site

Analyte / Sample ID: / Date:	FBO-SS-107 8/27/09	FBO-SS-108 8/27/09	FBO-SS-109 8/27/09	FBO-SS-109/Q 8/27/09
VOCs in Air (µg/m³)				
1,1,1-Trichloroethane	860	35	9.5 J	3.4 J
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.61	0.58	0.56 J	0.52 J
1,1-Dichloroethane	4.7	2.8	0.18 U	0.18 U
1,1-Dichloroethylene	0.4	0.18 U	0.18 U	0.18 U
1,2,4-Trimethylbenzene	5.5	2.3	1.7	2.4
1,3,5-Trimethylbenzene	2.7	0.94	0.65 J	0.74 J
1,4-Dichlorobenzene	0.27 U	0.27 U	0.27 U	1.5
2-Butanone (MEK)	22	8.7	7.5 J	7.7 J
2-Hexanone (MBK)	6.8	1.2	1.7 J	0.88 J
4-Ethyltoluene	1.1	0.53	0.27 J	0.48 J
4-Methyl-2-pentanone (MIBK)	20	38	29 J	11 J
Acetone	89 J	49	23	47
Benzene	4.6	3.3	0.74 J	0.98 J
Bromodichloromethane	0.6	0.65	0.49	0.3 U
Bromoform	0.65	0.46 U	0.8	0.46 U
Carbon Disulfide	13	8.6	1.4	0.61
Carbon Tetrachloride	0.28 U	0.28 U	0.28 U	0.33
Chloroform	1.8	1.3	0.41 J	0.3 J
Chloromethane	0.18	0.12	0.19 J	0.75 J
Cyclohexane	2.2	1.9	0.51 J	0.96 J
Dibromochloromethane	0.61	0.59	0.84	0.38 U
Dichlorodifluoromethane (Freon 12)	3	2.4	13 J	14 J
Ethanol	5.5	2.4	4.1 J	9.5 J
Ethyl Acetate	0.16 U	0.16 U	0.42	1.4
Ethylbenzene	2	1.3	0.37	1.2
Heptane	8.3	3.1	1.5 J	1.2 J
Hexane	6	4.7	1.5 J	1.9 J
Isopropanol	2.3	2	1.8 J	3.4 J
m&p-Xylene	12	4.2	2.2 J	4.9 J
o-Xylene	3.7	1.9	0.77	1.7
Styrene	0.4	0.36	0.19 U	0.42
Tetrachloroethylene	1.7	0.49	1.7 J	0.58 J
Tetrahydrofuran	2.9	0.57	0.45	0.46
Toluene	12	6.4	2.6 J	6.1 J
Trichloroethylene	3.8	3.6	0.36 J	1.2 J
Trichlorofluoromethane (Freon 11)	2.9	7.9	1.5 J	1.5 J

Key:

J = Estimated value.

U = Non detected.

mg/L = Milligrams per liter.

µg/L = Micrograms per liter.

Table 3-3
Summary of Positive Analytical Results for Sub-slab Soil Vapor Samples, Former Bright Outdoors Site

Analyte	Sample ID: / Date:	FBO-SS-110 / 8/27/09
VOCs in Air (µg/m³)		
1,1,1-Trichloroethane		11
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)		0.58
1,1-Dichloroethane		0.18 U
1,1-Dichloroethylene		0.18 U
1,2,4-Trimethylbenzene		0.97
1,3,5-Trimethylbenzene		0.26
1,4-Dichlorobenzene		0.27 U
2-Butanone (MEK)		6.2
2-Hexanone (MBK)		1.3
4-Ethyltoluene		0.22 U
4-Methyl-2-pentanone (MIBK)		32
Acetone		22
Benzene		0.31
Bromodichloromethane		0.3 U
Bromoform		0.46 U
Carbon Disulfide		1.4
Carbon Tetrachloride		0.28 U
Chloroform		0.22 U
Chloromethane		0.093 U
Cyclohexane		0.15 U
Dibromochloromethane		0.38 U
Dichlorodifluoromethane (Freon 12)		100
Ethanol		1.5 J
Ethyl Acetate		0.16 U
Ethylbenzene		0.34
Heptane		0.38
Hexane		0.47
Isopropanol		1.1
m&p-Xylene		1.4
o-Xylene		0.5
Styrene		0.19 U
Tetrachloroethylene		3.7
Tetrahydrofuran		0.69 J
Toluene		1.1
Trichloroethylene		0.5
Trichlorofluoromethane (Freon 11)		1.9

Key:

J = Estimated value.

U = Non detected.

mg/L = Milligrams per liter.

µg/L = Micrograms per liter.

Subslab Depressurization Systems and Miscellaneous Construction
Bright Outdoors Site – NYSDEC Site No. 7-04-023
Johnson City, New York
January 2010
(002700.DC21.02)

Limited Site Data Information

Attachment B

Soil Vapor Extraction (SVE)
Vacuum Pressure Testing Results

Aztech
Technologies, Inc.

EXPERTISE YOU CAN COUNT ON

5 McCrea Hill Road
Ballston Spa
New York 12020

Phone: 518-885-5383
Fax: 518-885-5385
www.aztechtech.com

February 4, 2009

Mr. Rick Watt
Ecology & Environment, Inc.
368 Pleasant View Drive
Lancaster, NY 14086

Re: Soil Vapor Extraction Pilot Test Data
Former Bright Outdoors Site
Johnson City, NY 13790

Dear Mr. Watt:

Aztech Technologies, Inc., (Aztech), on behalf of Ecology & Environment, Inc. (E&E), performed soil vapor extraction (SVE) pilot testing at the former Bright Outdoors Site, Johnson City, Broome County, New York. The SVE Pilot testing was conducted on December 15, and 16, 2008.

INTRODUCTION

The purpose of the pilot testing was to determine the feasibility of installing an SVE system to assist in remediating soil vapor concentrations of 1,1,1-trichloroethane and trichloroethene previously identified in the vapor underneath the building at the site. The testing was conducted on one (1) pilot test well (well SVE-1) by applying a wellhead vacuum to the tested well and monitoring the induced vacuum within the vadose zone.

Site Description

The property is a light industrial facility that included (but may have not been limited to) tenants such as a manufacturer of outdoor furniture and equipment that uses PVC pipe and vinyl polyester, a soft drink bottling company, and a wire screen manufacturer. The site is primarily level and the majority of it is paved.

Site Geology and Current Conditions

According to documentation provided by E&E, Inc., the site is underlain by shale bedrock which in turn is overlain by relatively impermeable glacial till. Above the till are relatively permeable glacial kame and outwash deposits. The uppermost deposits consist mainly of a poorly sorted mixture of disturbed, highly compacted sand and silt with beds of silt and clay. These overburden deposits are estimated to extend to depths between 60 and 100 feet below ground surface (bgs), with groundwater present at depths of approximately 10 to 15 feet bgs.

SVE PILOT TESTING

SVE pilot testing was performed in order to evaluate the response of unsaturated soil to the extraction of soil vapor via the tested well. The data obtained from the pilot testing can be used to develop a design and layout for an SVE remedial system at the site.

Methodology

Pilot testing was conducted utilizing a SVE blower to facilitate soil vapor extraction. The pilot testing involved the withdrawal of soil vapors from the vadose zone, and monitoring the vacuum induced into the subsurface via nearby monitoring wells and/or monitoring points.

Pilot testing was conducted on December 15 and 16, 2008. The SVE pilot test was initiated first by connecting the blower to a two (2)-inch inside diameter (ID) test well, and connecting magnehelic gauges to selected monitoring wells/observation points. The maximum vacuum achieved at the tested well was determined (60-inches H_2O), and the test conducted in four (4) steps by adjusting the wellhead vacuum applied to the well. This was accomplished by the introduction of bleed air into the intake side of the SVE blower. During the first step of the test (10 inches H_2O), the vacuum induced into the subsurface was monitored at selected observation points until stabilization had occurred. Subsequent to stabilization, the vacuum at the test well was increased to 20 inches (H_2O), and the second step of the test conducted until stabilization had occurred. Subsequent to stabilization, the vacuum at the test well was increased to 35 inches (H_2O), and the third step of the test conducted until stabilization had occurred. Lastly, after stabilization, the vacuum at the test well was increased to 60 inches (H_2O), and the final step was conducted until stabilization had occurred.

Pilot Test Results

Upon completing the pilot testing, the data for the SVE test were reduced and graphically represented by plotting the vacuum recorded in the monitoring wells and/or monitoring points versus their distance from the test well. These Vacuum Distribution Plots are prepared for each step of the test. A best-fit line is drawn through the data in order to determine the effective radius of influence (ROI) at that wellhead vacuum. The effective ROI is considered to be that distance where 0.1-inches of vacuum (H_2O) can be induced into the subsurface at a particular wellhead vacuum.

The data collected from the first step of the test (**Figure 1**; wellhead vacuum of 10 inches H_2O) a indicated that an induced vacuum of 0.1 inches H_2O was not recorded at any of the monitoring points (i.e., ROI less than five [5] feet).

The vacuum distribution plot presented as **Figure 2** (attached) represents data collected from the second step of the pilot test (wellhead vacuum of 20 inches H_2O). The vacuum distribution plot presented in Figure 2 indicates that a measurable induced vacuum in excess of 0.1 inches H_2O in well VM-04, located 30 feet from the tested well. This suggests an observed ROI of approximately 38 feet under this test configuration.

The vacuum distribution plot presented as **Figure 3** (attached) represents data collected from the third step (wellhead vacuum of 35 inches H_2O) of the pilot test. The data collected from this test configuration is similar to the distribution of vacuum observed in the second step of the SVE test. The vacuum distribution plot presented in Figure 3 indicates that a measurable induced vacuum of 0.07 inches H_2O at a distance of 80 feet from the tested well in VM-05 and 0.36 inches H_2O in well VM-04, 30 feet from the tested well. As such, the ROI is estimated at approximately 45 feet under this test configuration.

The vacuum distribution plot presented as **Figure 4** (attached) represents data collected from the fourth step (wellhead vacuum of 60 inches H_2O) of the test. The vacuum distribution plot presented in Figure 4 indicates that a measurable induced vacuum of 0.1 inches H_2O was recorded as far as 80 feet from the tested well in VM-05. However, the observed vacuum recorded in well VM-04 (0.065 inches H_2O), approximately 30 feet from the tested well, suggests a heterogeneous response at this wellhead vacuum. As such, the ROI is estimated at approximately 54 feet.

The field notes collected during the pilot testing are attached. Additionally, the field data has been compiled and reduced into the attached vacuum distribution plots.

If you have any questions or comments regarding the enclosed information, please feel free to contact the undersigned at (518) 885-5383.

Sincerely,
AZTECH TECHNOLOGIES, INC.

Randy Hoose for

Paul M. Shannon
Senior Geologist

Reviewed By:

Randy Hoose

Randolph Hoose
Senior Hydrogeologist

Attachments:
FIGURES
PILOT TEST FIELD DATA SHEETS

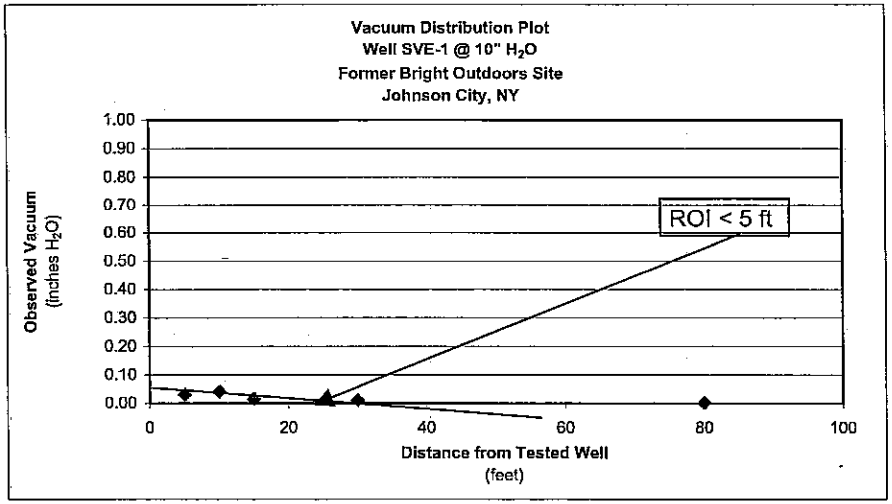
FIGURES

Data Collected During SVE Pilot Test
Former Bright Outdoors Site
Johnson City, NY

Step 1:
Tested Well: SVE-1
Vacuum @ Wellhead: 10 " H_2O
Flow Rate from well (2"): 501 fpm @ 44.5°F
Bleed Air (2"): 3,892 fpm
Humidity: 87.1%

Observation Point	Distance	Observed Vacuum
VM-01	5.0	0.030
VM-02	10	0.040
VM-03	15	0.015
VM-04	30	0.010
VM-05	80	0.000

FIGURE 1

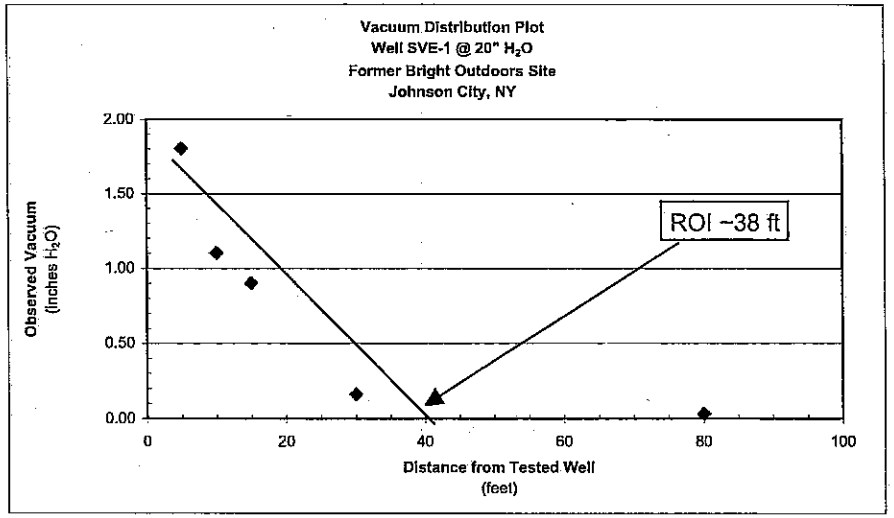


Test Date: December 15, 2008

Step 2:
Tested Well: SVE-1
Vacuum @ Wellhead: 20 " H_2O
Flow Rate from well (2"): 1,061 fpm @ 39.5°F
Bleed Air (2"): 3,750 fpm
Humidity: 47.4%

Observation Point	Distance	Observed Vacuum
VM-01	5.0	1.800
VM-02	10	1.100
VM-03	15	0.900
VM-04	30	0.160
VM-05	80	0.030

FIGURE 2



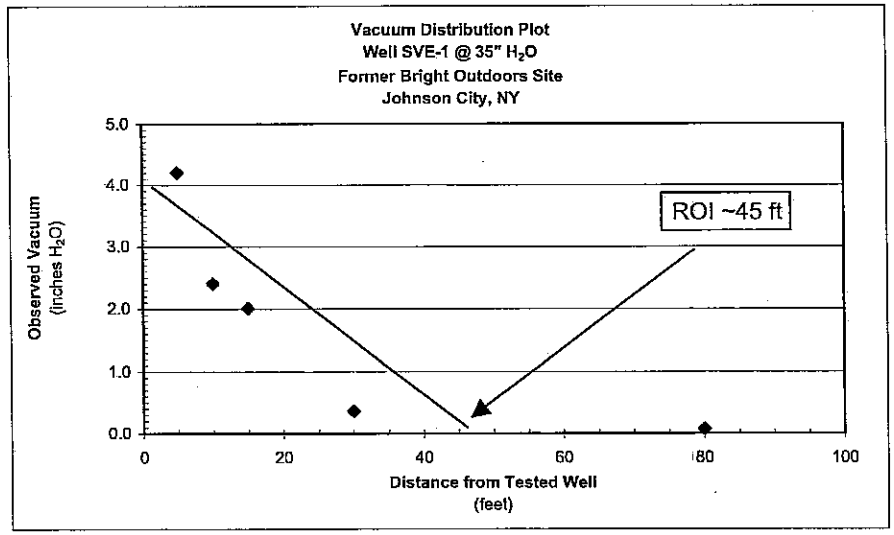
Test Date: December 16, 2008

Data Collected During SVE Pilot Test
Former Bright Outdoors Site
Johnson City, NY

Step 3:
Tested Well: SVE-1
Vacuum @ Wellhead: 35 " H_2O
Flow Rate from well (2"): 1,657 fpm @ 39.5°F
Bleed Air (2"): 3,046 fpm
Humidity: 45.1%

Observation Point	Distance	Observed Vacuum
VM-01	5.0	4.20
VM-02	10	2.40
VM-03	15	2.00
VM-04	30	0.36
VM-05	80	0.07

FIGURE 3

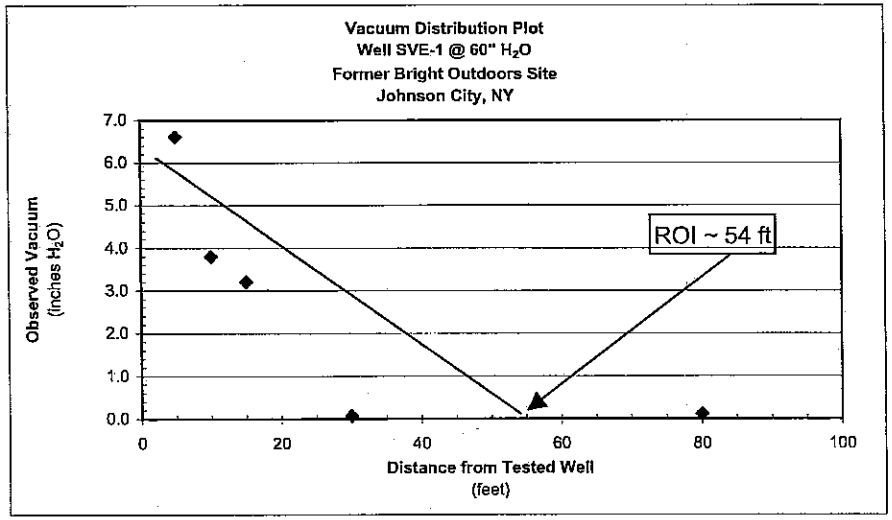


Test Date: December 16, 2008

Step 4:
Tested Well: SVE-1
Vacuum @ Wellhead: 60 " H_2O
Flow Rate from well (2"): 5,732 fpm @ 43.1°F
Bleed Air (2"): 2,172 fpm
Humidity: 41.6%

Observation Point	Distance	Observed Vacuum
VM-01	5.0	6.60
VM-02	10	3.80
VM-03	15	3.20
VM-04	30	0.065
VM-05	80	0.105

FIGURE 4



Test Date: December 16, 2008

PILOT TEST FIELD DATA SHEETS

Pilot Test Data
Vapor Extraction

Site: E Bright Outdoors | Blower Make/Model: A.R.T. RB1300-50 | Pipe Diameter - Manifold: 2"

Date: 12/15/08 | Max Vacuum @ Wellhead: ~~"~~ H_2O | Pipe Diameter – Bleed Air: 2"

Tested Well: | Well Diameter: 2" | Pipe Diameter – Effluent: 2"

Distance From Tested Well / Well ID		5' / VM 01	10' / VM 02	15' / VM 03	30' / VM 04	~~80~~ / VM 05	
Step 1:	**Start**	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum
Vac @ Wellhead:	5" H_2O	3:52 -.021	0	0	0	0	
Airspeed Manifold:	1007fm 501	4:10 .04	0	0	0	0	
~~Air Speed:~~ Bleed Air:	44.5°F 3892	4:30 .04	.025	~~.015~~ .013	0	0	
Air Speed: Effluent:		4:56 .03	~~.015~~ .04	.015	.01	0	
~~PID~~ Humidity	87.1%	5:10 .02	0	0	0	0	
Step 1:	**End**	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum
Vac @ Wellhead:	10" H_2O						
Airspeed Manifold:	656						
~~Air Speed:~~ Bleed Air:	Temp 46.2°F 3432						
Air Speed: Effluent:							
~~PID~~ Humidity	87.5%						
Step 2:	**Start** 8:15	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum
Vac @ Wellhead:	20" H_2O	8:10 .85	.58	.43	.09	.02	
Airspeed Manifold:	921	8:25 1.40	.90	.70	.11	.02	
Air Speed: Bleed Air:	Temp 37.2°F 3435	8:40 2.0	1.25	1.0	.17	.035	
Air Speed: Effluent:		8:55 2.0	1.24	.95	.17	.04	
~~PID~~ Humidity	47.9%	9:10 ~~1.80~~ 1.80	1.10	.90	.16	.03	
Step 2:	**End**	9:55 1.80	1.10	.90	.16	.03	
Vac @ Wellhead:	20" H_2O						
Airspeed Manifold:	1061						
Air Speed: Bleed Air:	TEMP 39.5°F 3750						
Air Speed: Effluent:							
~~PID~~ Humidity	47.4%						

Start 3:36 / 3:46 / 10"

END 5:20

12/16/08

Time START 8:01

Time END 9:55

Pilot Test Data
Vapor Extraction

Site: EBRIGHT OUTDOORS Blower Make/Model: ART R61300-50 Pipe Diameter - Manifold: 2"

Date: 12/16/08 Max Vacuum @ Wellhead: Pipe Diameter – Bleed Air: 2"

Tested Well: Well Diameter: 2" Pipe Diameter – Effluent: 2"

Distance From Tested Well / Well ID		5' VM 01	10' VM 02	15' VM 03	30' VM 04	50' VM 05	
Step 3:	**Start** 10:10	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum
Vac @ Wellhead:	35" H_2O	4:50 4.40	2.60	2.20	.37	.05	
Airspeed Manifold:	1365	10:05 4.20	2.60	2.20	.37	.05	
Air Speed: Bleed Air:	Temp 40.2°F 2565	10:20 4.20	2.60	2.00	.36	.075	
Air Speed: Effluent:		10:35 4.20	2.60	~~2.00~~ 2.00	.36	.05	
~~PID~~ Humidity	46.5%	10:50 4.20	2.40	2.00	.36	.070	
Step 3:	**End** 11:00	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum
Vac @ Wellhead:	35" H_2O	11:05 4.20	2.40	2.00	.36	.070	
Airspeed Manifold:	1657						
Air Speed: Bleed Air:	Temp 39.5°F 30%						
Air Speed: Effluent:							
~~PID~~ Humidity	45.1%						
Step 4:	**Start** 11:25	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum
Vac @ Wellhead:	10.00 H_2O	11:40 7.40	4.20	3.50	.75	.13	
Airspeed Manifold:		11:55					
Air Speed: Bleed Air:	Temp	12:10					
Air Speed: Effluent:		12:25					
~~PID~~ Humidity		12:40					
Step 4:	**End**	12:55					
Vac @ Wellhead:							
Airspeed Manifold:							
Air Speed: Bleed Air:	Temp						
Air Speed: Effluent:							
PID Humidity							

Time Start 9:35

End Time 11:13

Time Start 11:25

End Time

Pilot Test Data
Vapor Extraction

ART

Site: EBRIGHT OUTDOORS | Blower Make/Model: RG1300-50 | Pipe Diameter - Manifold: 2"

Date: 12/12/04 | Max Vacuum @ Wellhead: 60"H_2O | Pipe Diameter – Bleed Air: 2"

Tested Well: | Well Diameter: 2" | Pipe Diameter – Effluent: 2"

Distance From Tested Well / Well ID		5' / VM01	10' / VM02	15' / VM03	30' / VM04	80' / VM05	
Step #4 Start (1:35)		Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum
Vac @ Wellhead:	60"H_2O	1:35 8.80	5.20	4.40	.90	.14	
Airspeed Manifold:	5922	1:40 8.20	4.80	4.00	.85	.13	
Air Speed: Bleed Air:	TEMP 39.1°F 1746	1:55 7.80	4.40	3.80	.80	.13	
Air Speed: Effluent:		2:10 7.40	4.20	3.60	.75	.115	
~~PID~~ Humidity	44.2%	2:25 6.80	4.00	3.40	.70	.115	
Step #4 End (2:35)		Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum
Vac @ Wellhead:	60"H_2O	2:10 6.60	3.80	3.20	.65	.105	
Airspeed Manifold:	5732						
Air Speed: Bleed Air:	TEMP 43.1°F 2172						
Air Speed: Effluent:							
~~PID~~ Humidity	41.6%						
Step 2:	**Start**	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum	Observed Vacuum
Vac @ Wellhead:							
Airspeed Manifold:							
Air Speed: Bleed Air:							
Air Speed: Effluent:							
PID							
Step 2:	**End**						
Vac @ Wellhead:							
Airspeed Manifold:							
Air Speed: Bleed Air:							
Air Speed: Effluent:							
PID							

Time Start 1:10

Time End 2:42

Subslab Depressurization Systems and Miscellaneous Construction
Bright Outdoors Site – NYSDEC Site No. 7-04-023
Johnson City, New York
January 2010
(002700.DC21.02)

Limited Site Data Information

Attachment C

Interior Building Borehole Logs

Borehole Record for SVE-01

- Drilling Log
- Narrative Lithologic Description
- Well Development Record
- Well Development -- Parameter Measurements
- Investigation - Derived Waste Inventory Sheet

DRILLING LOG FOR SVE-01

Project Name FORMER BRIGHT OUTDOORS

Site Location JOHNSON CITY, NY

Date Started/Finished 12/3/08

Drilling Company AZTECH TECHNOLOGY

Driller's Name MARTY HARRINGTON

Geologist's Name MEGAN FRONCKOWIAK

Geologist's Signature [signature]

Rig Type (s) MOBILE B3500

Drilling Method (s) HSA & MACRO CORE

Bit Size (s) 9" Auger Size (s) 4 1/4" ID

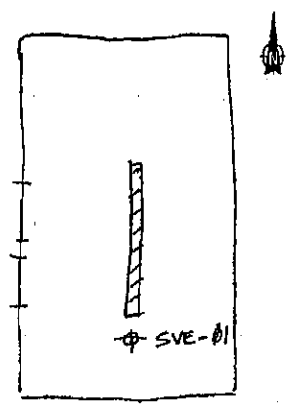
Auger/Split Spoon Refusal NA

Total Depth of Borehole is 9

Total Depth of Corehole is NA

Water Level (TOIC)		
Date	Time	Level (Feet)

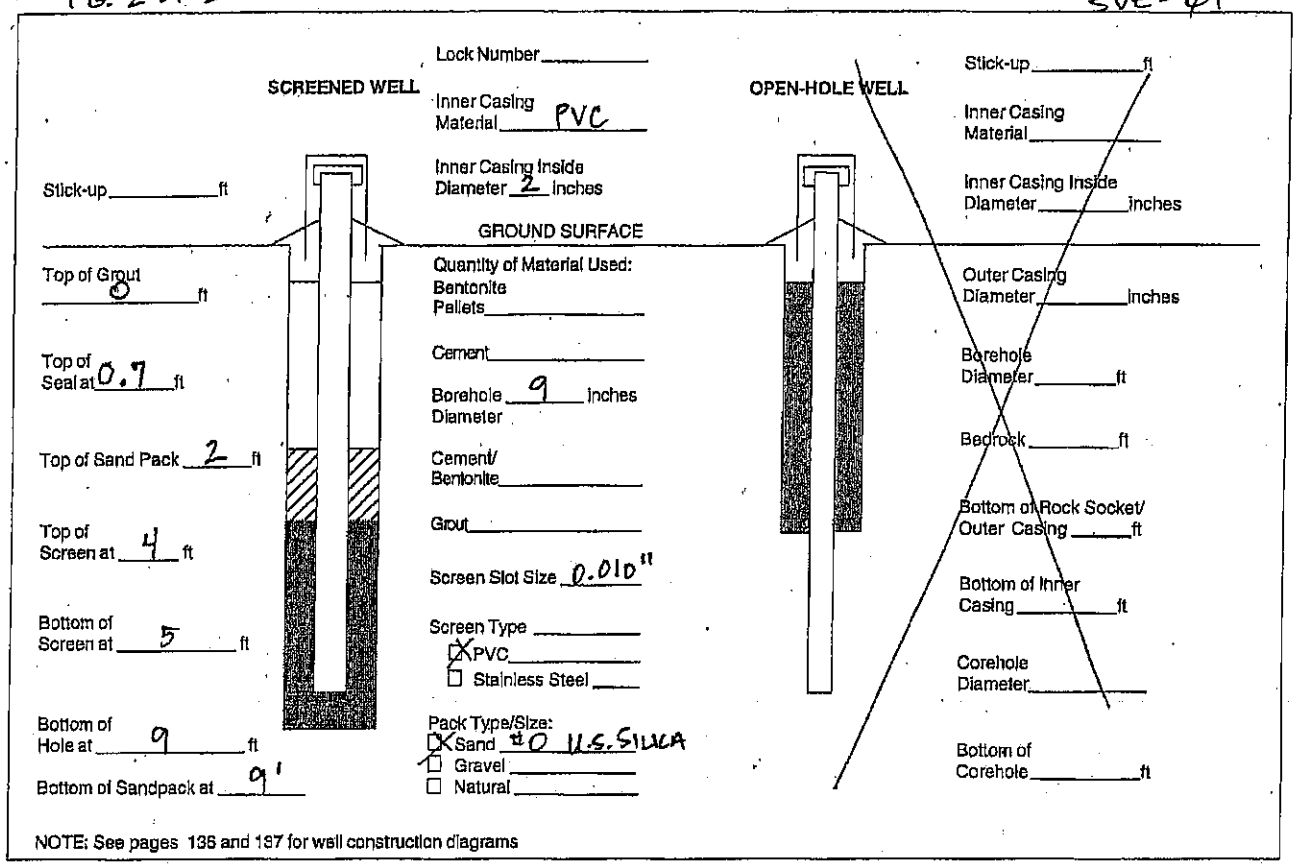
Well Location Sketch



NTS

Depth (Feet)	Sample Number	Blows on Sampler	Soil Components Rock Profile CL SL S GR	Penetration Times	Run Number	Core Recovery	RQD	Fracture Sketch	PID HNu/OVA (ppm)	Comments
1			CL/SL	13:50	1	3.6'	-	-	0	Collect sample SVE-01-Z1 @ depth of 1.5' @ 14:10
2										
3										
4										
5										
6			SL/S	14:00	2	4.5'	-	-	0	sample SVE-01-Z2 depth= 2.5' @ 14:15
7										
8										
9										
10										sample SVE-01-Z3 depth=4' @ 14:18
11										
12										
13										sample SVE-01-Z4 depth=8' @ 14:35 MS/MSD
14										
15										

SVE-01



NOTE: See pages 136 and 137 for well construction diagrams

Depth-ft.	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content: Dry	Moist	Wet
1	.7-1.2' sandy gravel	⊗	⊗	○
2	1.2-1.9' gray to brown silty clay	⊗	⊗	○
3	1.9-5' yellowish brown to light brown silt	⊗	⊗	○
4		⊗	⊗	○
5		⊗	⊗	○
6	5-6.8' yellowish brown to light brown silt	⊗	⊗	○
7	6.8-10' brown, very fine sand grading down	⊗	⊗	○
8	to a med. brown & fine sand, well	⊗	⊗	○
9	sorted, ~~fossy~~	⊗	⊗	○
10		○	○	○
11		○	○	○
12		○	○	○
13				
14		○	○	○
15		○	○	○

Borehole Record for VM-01

- Drilling Log
- Narrative Lithologic Description
- Well Development Record
- Well Development -- Parameter Measurements
- Investigation - Derived Waste Inventory Sheet

DRILLING LOG FOR VM-01

Project Name FORMER BRIGHT OUTDOORS

Site Location JOHNSON CITY, NY

Date Started/Finished 12/3/08

Drilling Company AZTECH TECHNOLOGY

Driller's Name MARTY HARRINGTON

Geologist's Name MEGAN ERONCKOWIAK

Geologist's Signature [signature]

Rig Type (s) MOBILE B350D

Drilling Method (s) ~~HSA~~ MACROCORE

Bit Size (s) 2.25" Auger Size (s) NA

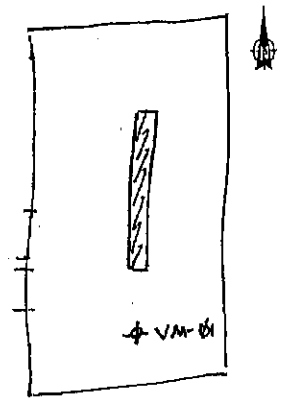
Auger/Split Spoon Refusal NA

Total Depth of Borehole is 10'

Total Depth of Corehole is NA

Water Level (TOIC)		
Date	Time	Level(Feet)

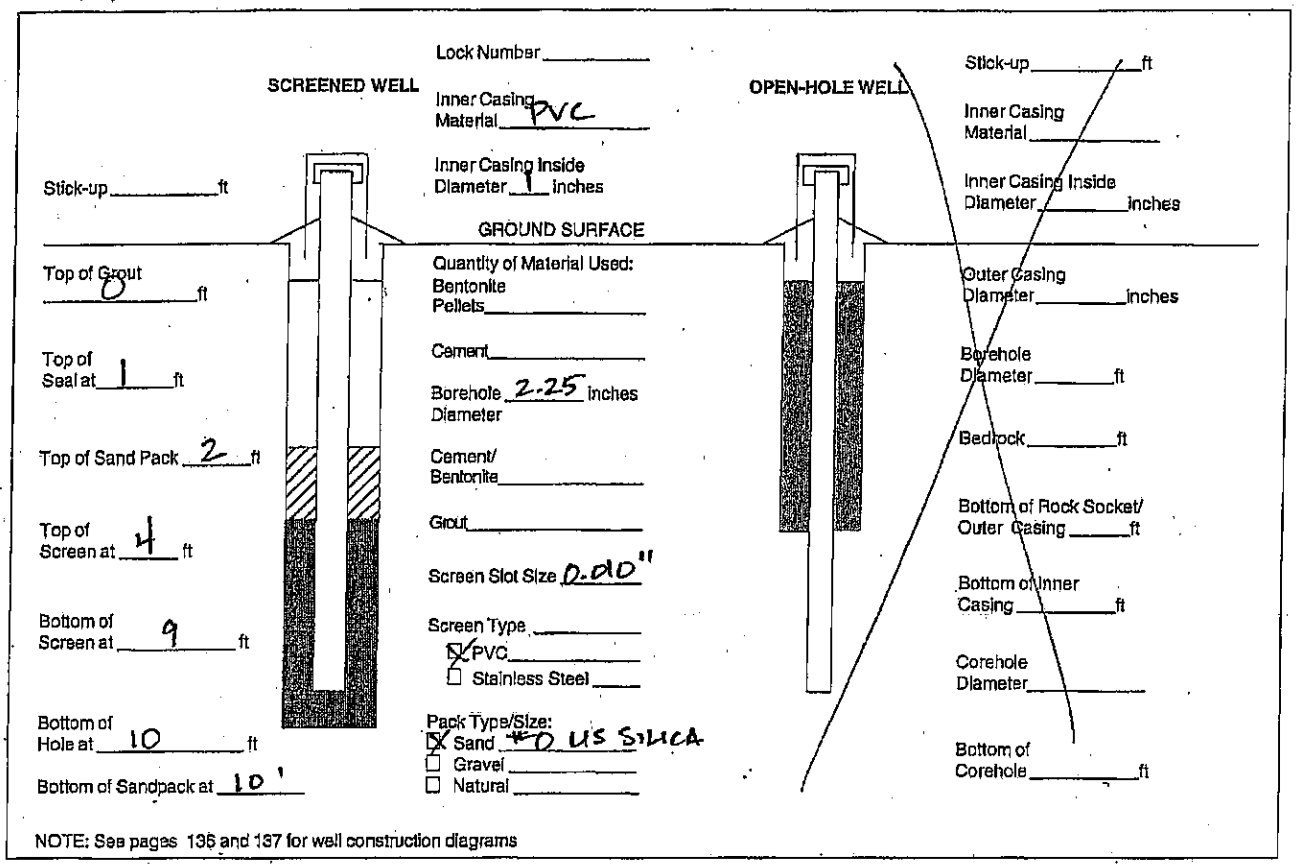
Well Location Sketch



NTS

Depth(Feet)	Sample Number	Blows on Sampler	Soil Components Rock Profile CL SL S GR	Penetration Times	Run Number	Core Recovery	RQD	Fracture Sketch	PID ~~HNu/OVA~~ (ppm)	Comments
1			SL	15:20	1	4.0'	-	-	0	sample VM-01-Z1 depth=1.5' @ 15:25
2										
3										sample VM-01-Z1/Q depth=1.5' @ 15:25
4										
5			SL/S	15:35	2	4.8'	-	-	0	
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

VM-01



NOTE: See pages 136 and 137 for well construction diagrams

Depth-ft.	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content: Dry	Moist	Wet
1	0-.6' concrete floor	○	○	○
2	0.6-1' sandy gravel	⊗	⊗	○
3	1-5' mottled silt gray from 1.5-1.7'	⊗	⊗	○
4	yellowish brown to brown silt, gets	⊗	⊗	○
5	somewhat darker as more down	⊗	⊗	○
6		⊗	⊗	○
7	5-7.5' brown silt	⊗	⊗	○
8	7.5-10' very fine sand grading down to fine sand	⊗	⊗	○
9	med. brown	⊗	⊗	○
10		⊗	⊗	○
11		○	○	○
12		○	○	○
13				
14		○	○	○
15		○	○	○

Borehole Record for VM-02

- Drilling Log
- Narrative Lithologic Description
- Well Development Record
- Well Development -- Parameter Measurements
- Investigation - Derived Waste Inventory Sheet

DRILLING LOG FOR VM-Ø2

Project Name FORMER BRIGHT OUTDOORS

Site Location JOHNSON CITY, NY

Date Started/Finished 12/3/08

Drilling Company AZTECH TECHNOLOGY

Driller's Name MARTY HARRINGTON

Geologist's Name MEGAN DRONZKOWIAK

Geologist's Signature [signature]

Rig Type (s) MOBILE B3500

Drilling Method (s) ~~HSA~~ MACROCORE

Bit Size (s) 2.25" Auger Size (s) N/A

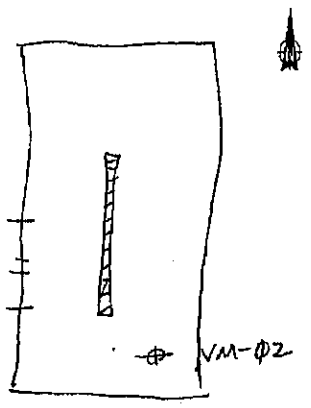
Auger/Split Spoon Refusal N/A

Total Depth of Borehole is 10'

Total Depth of Corehole is N/A

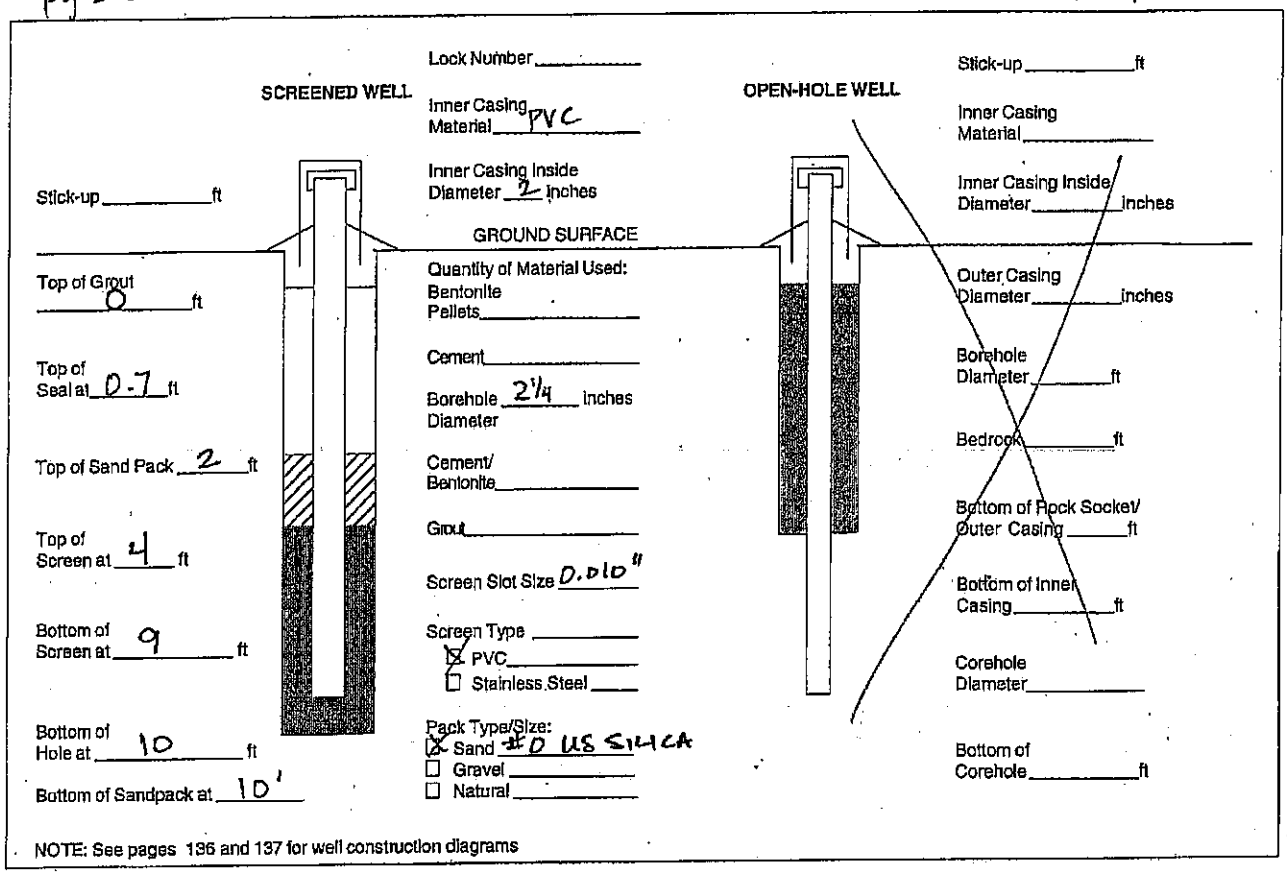
Water Level (TOIC)		
Date	Time	Level(Feet)

Well Location Sketch



Depth(Feet)	Sample Number	Blows on Sampler	Soil Components Rock Profile CL SL S GR	Penetration Times	Run Number	Core Recovery	RQD	Fracture Sketch	PID HNu/OVA (ppm)	Comments
1			SL	16:30	1	4.1'	-	-	0	sample VM-Ø2-Z1 depth = 2.5' @ 16:35
2										
3										
4										
5			SL/S	16:35	2	3.7'	-	-	0	
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

VM-02



NOTE: See pages 136 and 137 for well construction diagrams

Depth-ft.	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content: Dry	Moist	Wet
1	0-0.6' concrete floor	⊘	⊘	○
2	0.6-1.2' sandy gravel subbase	⊘	⊘	○
3	1.2-2.6' gray clayey silt	⊘	⊘	○
4	2.6-5' mottled gray to light brown silt	⊘	⊘	○
5		⊘	⊘	○
6		⊘	⊘	○
7	5-6.7' ~~mottled~~ brown silt, slightly mottled at top	⊘	⊘	○
8	6.7-10' med. brown very fine sand grading down	⊘	⊘	○
9	to dk. brown fine sand	⊘	⊘	○
10		○	○	○
11		○	○	○
12		○	○	○
13		○	○	○
14		○	○	○
15		○	○	○

Borehole Record for VM-03

- Drilling Log
- Narrative Lithologic Description
- Well Development Record
- Well Development -- Parameter Measurements
- Investigation - Derived Waste Inventory Sheet

DRILLING LOG FOR VM-Φ3

Project Name FORMER BRIGHT OUTDOORS

Site Location JOHNSON CITY, NY

Date Started/Finished 12/3/08

Drilling Company AZTECH TECHNOLOGY

Driller's Name MARTY HARRINGTON

Geologist's Name MEGAN FRONCKOWIAK

Geologist's Signature [signature]

Rig Type (s) MOBILE B3500

Drilling Method (s) ~~HSA~~ new MACROCORE

Bit Size (s) 2.25" Auger Size (s) NA

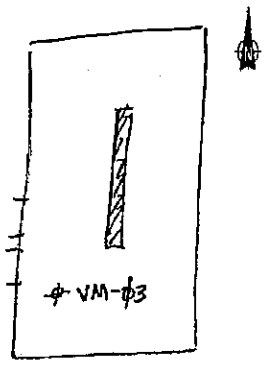
Auger/Split Spoon Refusal N/A

Total Depth of Borehole is 10'

Total Depth of Corehole is N/A

Water Level (TOIC)		
Date	Time	Level(Feet)

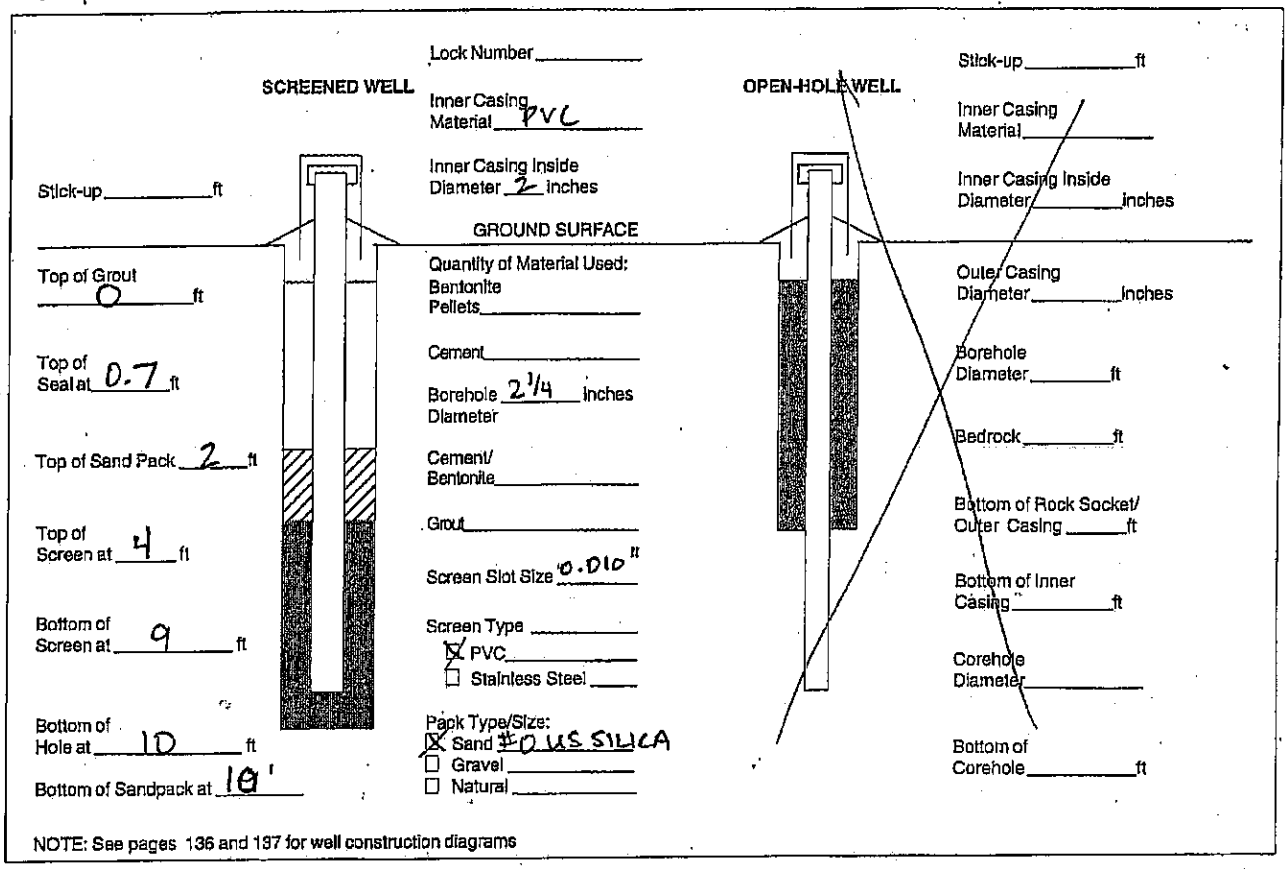
Well Location Sketch



NTS

Depth(Feet)	Sample Number	Blows on Sampler	Soil Components Rock Profile CL SL S GR	Penetration Times	Run Number	Core Recovery	RQD	Fracture Sketch	PID ~~HNu/OVA~~ (ppm)	Comments
1			S/SL	15:50	1	4.2'	-	-	0	sample VM-1Φ3-Z1 depth = 0.7' @ 15:55
2										
3										
4										
5			SL/S	15:55	2	~~4.2'~~ 4.1' MF	-	-	0	
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

VM-03



NOTE: See pages 136 and 137 for well construction diagrams

Depth-ft.	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content: Dry	Moist	Wet
1	0-0.6' concrete floor	⊗	⊗	○
2	0.6-0.8' black sandy gravel	⊗	⊗	○
3	0.8-1' brown sandy silt	⊗	⊗	○
4	1-1.4' gray silty clay	⊗	⊗	○
5	1.4-5' mottled gray to light brown silt	⊗	⊗	○
6		⊗	⊗	○
7	5-6.6' brown silt	⊗	⊗	○
8	6.6-10' very fine sand grading down to fine sand	⊗	⊗	○
9	med. brown	⊗	⊗	○
10		○	○	○
11		○	○	○
12		○	○	○
13		○	○	○
14		○	○	○
15		○	○	○

Borehole Record for VM-04

- Drilling Log
- Narrative Lithologic Description
- Well Development Record
- Well Development -- Parameter Measurements
- Investigation - Derived Waste Inventory Sheet

DRILLING LOG FOR VM-04

Project Name FORMER BRIGHT OUTDOORS

Site Location JOHNSON CITY, NY

Date Started/Finished 12/3/08

Drilling Company AZTECH TECHNOLOGY

Driller's Name MARTY HARRINGTON

Geologist's Name MEGAN FRONCKOWIAK

Geologist's Signature [signature]

Rig Type (s) MOBILE B3500

Drilling Method (s) MF ~~HSA~~ MACROCORE

Bit Size (s) MF ~~2.25~~ 2.25" Auger Size (s) ~~HSA~~ NA MF

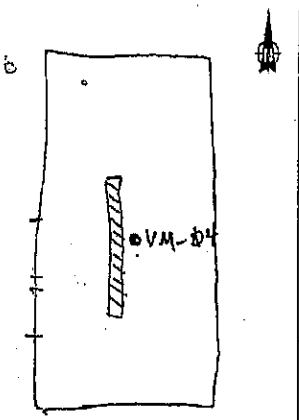
Auger/Split Spoon Refusal N/A

Total Depth of Borehole is 9.7'

Total Depth of Corehole is N/A

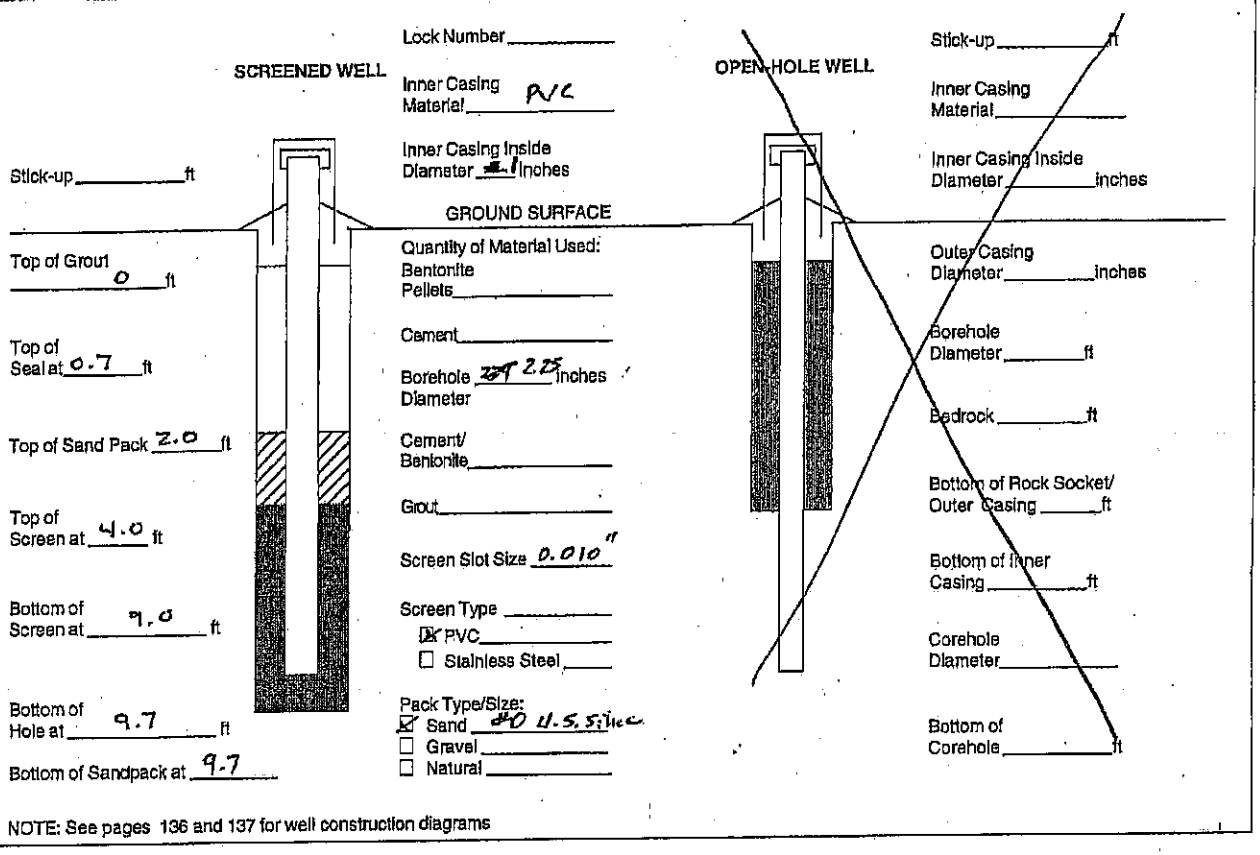
Water Level (TOIC)		
Date	Time	Level (Feet)
12/3/08	09:30	—

Well Location Sketch



Depth (Feet)	Sample Number	Blows on Sampler	Soil Components Rock Profile CL SL S GR	Penetration Times	Run Number	Core Recovery	RQD	Fracture Sketch	PID ~~HNu/OVA~~ (ppm)	Comments
0			CL/SL	09:15	1	3.6'	—	—	0	Collect VM-04-2' soil sample from 2' @ 09:20
5			SL/S	09:30	2	4.9'	—	—	0	

VM-04



NOTE: See pages 136 and 137 for well construction diagrams

Depth-ft.	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content: Dry	Moist	Wet
1	0-1.1' concrete floor	⊗	⊗	○
2	1.1-1.5' gravel	⊗	⊗	○
3	1.5'-2.5' gray clay w/ silt	⊗	⊗	○
4	2.5-5' mottled silt, very hard, light brown	⊗	⊗	○
5		⊗	⊗	○
6		⊗	⊗	○
7	5.8-6.2' silty gravel ✱ zone, light brown	⊗	⊗	○
8	6.2-8' same silt w/ some sand and trace clay	⊗	⊗	○
9	8-10' darker brown, fine sand	⊗	⊗	○
10		○	○	○
11		○	○	○
12		○	○	○
13		○	○	○
14		○	○	○
15		○	○	○

Borehole Record for VM-05

- Drilling Log
- Narrative Lithologic Description
- Well Development Record
- Well Development -- Parameter Measurements
- Investigation - Derived Waste Inventory Sheet

DRILLING LOG FOR VM-05

Project Name FORMER BRIGHT OUTDOORS

Site Location JOHNSON CITY, NY

Date Started/Finished 12/3/08

Drilling Company AZTECH TECHNOLOGY

Driller's Name MARTY HARRINGTON

Geologist's Name MEGAN KONCKOWIAK

Geologist's Signature [signature]

Rig Type (s) MOBILE B3500

Drilling Method (s) ~~HSA~~ MACROCORE

Bit Size (s) 2.25" Auger Size (s) NA

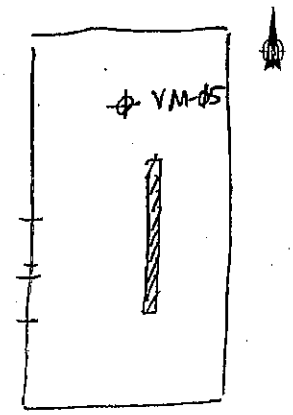
Auger/Split Spoon Refusal NA

Total Depth of Borehole Is 10'

Total Depth of Corehole Is NA

Water Level (TOIC)		
Date	Time	Level (Feet)

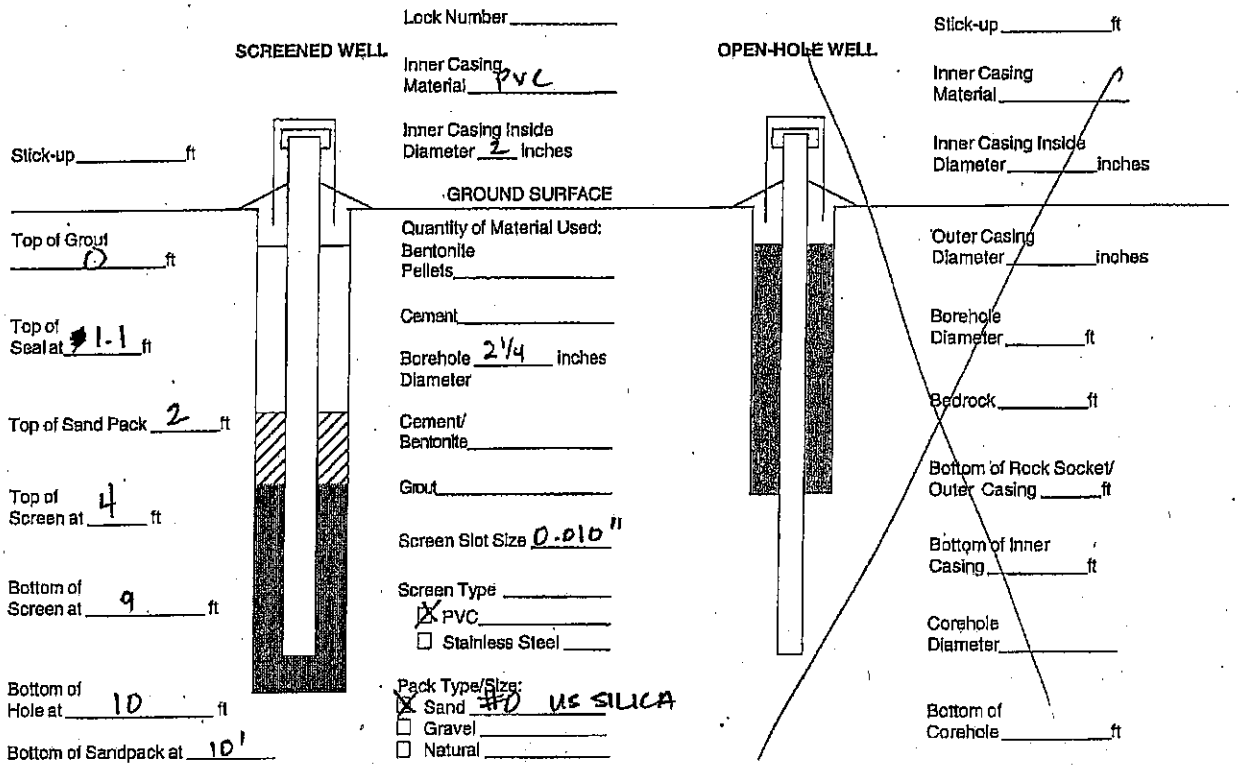
Well Location Sketch



NTS

Depth (Feet)	Sample Number	Blows on Sampler	Soil Components Rock Profile CL SL S GR	Penetration Times	Run Number	Core Recovery	RQD	Fracture Sketch	PID ~~HNu/OVA~~ (ppm)	Comments
1			SL	16:45	1	3.4'	-	-	0	sample VM-05-Z1 depth = 1.5' @ 16:47
2										
3										
4										
5			SL/S	16:50	2	4.1'	-	-	0	
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

VM-05



NOTE: See pages 136 and 137 for well construction diagrams

Depth-ft.	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content: Dry	Moist	Wet
1	0-1' concrete floor	X	X	○
2	1-1.5' grayish brown silt	X	X	○
3	1.5-5' mottled tan-brown silt	X	X	○
4		X	X	○
5		X	X	○
6	5-7' light brown silt	X	X	○
7	7-7.8' sand-fine to coarse	X	X	○
8	7.8-8.2' med. brown fine sand	X	X	○
9	8.2-10' med. brown sandy gravel	X	X	○
10		○	○	○
11		○	○	○
12		○	○	○
13				
14		○	○	○
15		○	○	○

Borehole Record for MW-07

- Drilling Log
- Narrative Lithologic Description
- Well Development Record
- Well Development -- Parameter Measurements
- Investigation - Derived Waste Inventory Sheet

DRILLING LOG FOR MW-07

Project Name FORMER BRIGHT OUTDOORS

Site Location JOHNSON CITY, NY

Date Started/Finished 12/3/08

Drilling Company AZTECH TECHNOLOGY

Driller's Name MARTY HARRINGTON

Geologist's Name MEGAN FRONCKOWIAK

Geologist's Signature [signature]

Rig Type (s) MOBILE B3500

Drilling Method (s) HSA & MACROCORE

Bit Size (s) 9" Auger Size (s) 4 1/4" ID

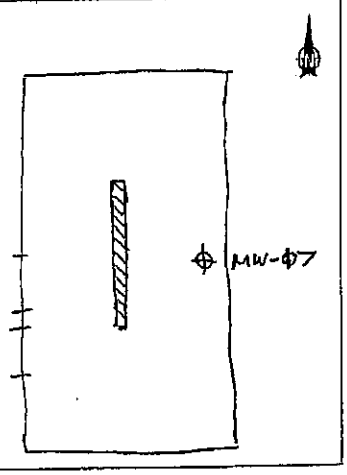
Auger/Split Spoon Refusal N/A

Total Depth of Borehole is 22'

Total Depth of Corehole is N/A

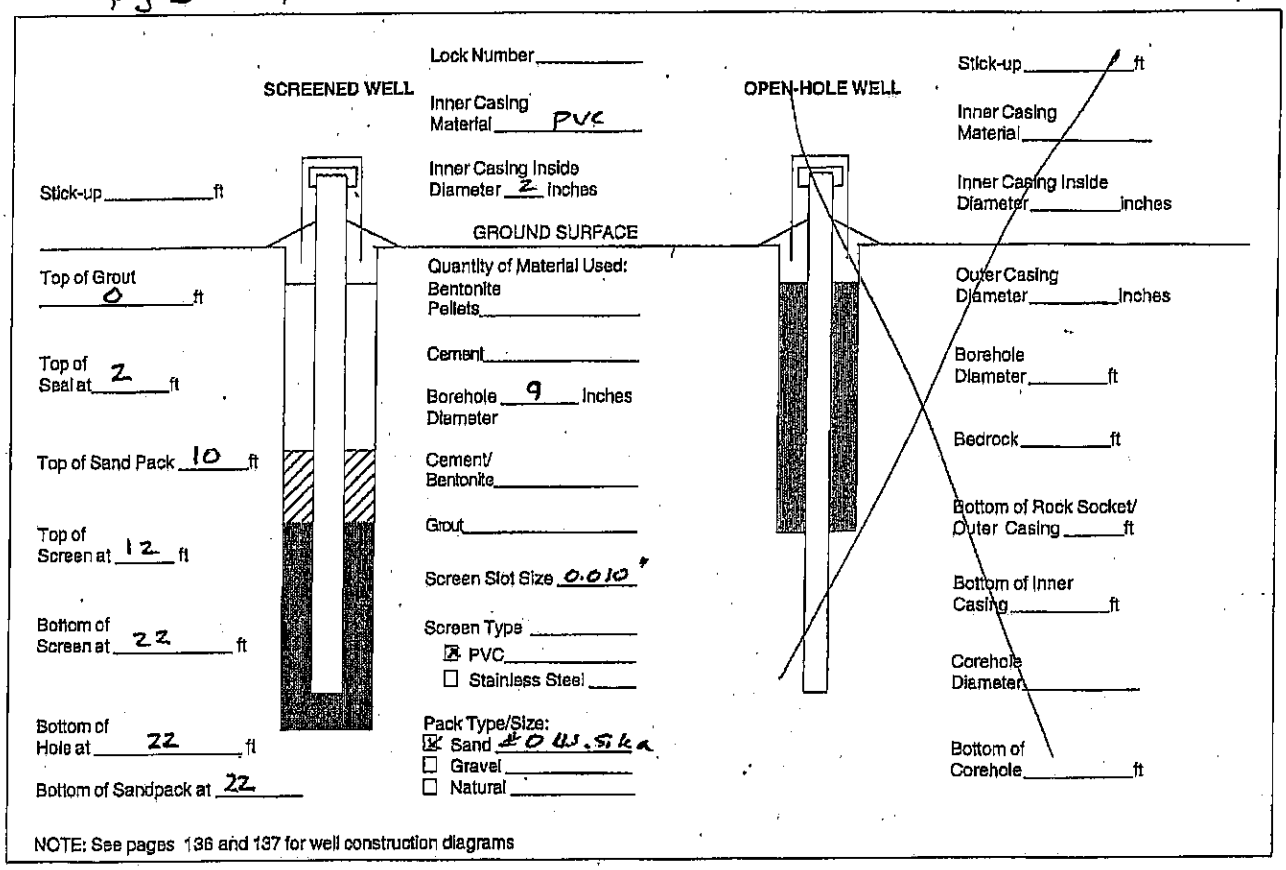
Water Level (TOIC)		
Date	Time	Level(Feet)
12/3/08	08:40	10.5' (open hole)

Well Location Sketch



Depth(Feet)	Sample Number	Blows on Sampler	Soil Components Rock Profile CL SL S GR	Penetration Times	Run Number	Core Recovery	RQD	Fracture Sketch	PID ~~HNu/OVA~~ (ppm)	Comments
0-5			SL	08:05	1	1'	-	-	0	Collect MW-07-21 soil sample from 1' @ 08:10
5-10			SL/S	08:15	2	3.3'	-	-	0	
10-15			S	08:25	3	4'	-	-	0	

MW-07



NOTE: See pages 136 and 137 for well construction diagrams

Depth-ft.	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content: Dry	Moist	Wet
1	0-0.5' concrete	○	⊗	○
2	0.5-0.8' gravel subbase	○	⊗	○
3	0.8-1.7' mottled little gray to light brown silt	○	⊗	○
4		○	⊗	○
5		○	⊗	○
6	5-5.7' silt with little clay, brown to med. brown throughout	○	⊗	○
7	5.7-6.8', sandy silt w/ trace clay, sand fine-coarse	○	⊗	○
8	6.8-7.4' sandy silt, wet	○	○	⊗
9	7.4-8.3' very fine sand	○	⊗	○
10		○	⊗	○
11	10-15' very fine to fine sand, med. brown to brown	○	○	⊗
12		○	○	⊗
13		○	○	⊗
14		○	○	⊗
15		○	○	⊗

MW-07

Depth(feet)	Sample Number	Blows on Sampler	Soil Components CL SL S GR	Rock Profile	Penetration Times	Run Number	Core Recovery	RQD	Fracture Sketch	PID ~~HNu/OVA~~ (ppm)	Comments
16			S		08:40	4	.6'	-	-	0	little recovery gravel stuck in shoe
17											
18											
19											
20						5	0				no recovery likely due to gravel
21											
22											
23											
24											
25			end of hole								
26											
27											
28											
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
41											
42											
43											
44											
45											

MW-17

Depth(feet).	NARRATIVE LITHOLOGIC DESCRIPTION	Moisture Content: Dry	Moist	Wet
16	15-15.6' wet, sandy gravel	○	○	⊗
17		○	○	⊗
18		○	○	⊗
19		○	○	⊗
20		○	○	⊗
21	20-25' no recovery	○	○	○
22		○	○	○
23		○	○	○
24		○	○	○
25		○	○	○
26		○	○	○
27		○	○	○
28		○	○	○
29		○	○	○
30		○	○	○
31		○	○	○
32		○	○	○
33		○	○	○
34		○	○	○
35		○	○	○
36		○	○	○
37		○	○	○
38		○	○	○
39		○	○	○
40		○	○	○
41		○	○	○
42		○	○	○
43		○	○	○
44		○	○	○
45				

WELL DEVELOPMENT RECORD

SITE FORMER BRIGHT OUTDOORS DATE 12/4/08

LOCATION JOHNSON CITY, NY WELL NO. MW-07

MEASUREMENT OF WATER LEVEL AND WELL VOLUME

- Prior to sampling, the static water level and total depth of the well will be measured with a calibrated weighted line. Care will be taken to decontaminate equipment between each use to avoid cross contamination of wells.
- The number of linear feet of static water (difference between static water level and total depth of well) will be calculated.
- The static volume will be calculated using the formula:

$$V = Tr^2 (0.163)$$

Where:
V = Static volume of well in gallons;
T = Depth of water in the well, measured in feet;
r = Inside radius of well casing in inches;
and 0.163 = A constant conversion factor which compensates for r^2h factor for the conversion of the casing radius from inches to feet, the conversion of cubic feet to gallons, and (pi).
1 well volume (v) = 1.9 gallons.

Volume of Water in Casing or Hole

Diameter of Casing or Hole (In)	Gallons per Foot of Depth	Cubic Feet per Foot of Depth	Liter per Meter of Depth	Cubic Meters per Meter of Depth
1	0.041	0.0055	0.509	0.509×10^{-3}
1 1/2	0.092	0.0123	1.142	1.142×10^{-3}
2	0.163	0.0218	2.024	2.024×10^{-3}
2 1/2	0.255	0.0341	3.167	3.167×10^{-3}
3	0.367	0.0491	4.558	4.558×10^{-3}
3 1/2	0.500	0.0668	6.209	6.209×10^{-3}
4	0.653	0.0873	8.110	8.110×10^{-3}
4 1/2	0.826	0.1104	10.260	10.260×10^{-3}
5	1.020	0.1364	12.670	12.670×10^{-3}
5 1/2	1.234	0.1650	15.330	15.330×10^{-3}
6	1.469	0.1963	18.240	18.240×10^{-3}
7	2.000	0.2673	24.840	24.840×10^{-3}
8	2.611	0.3491	32.430	32.430×10^{-3}
9	3.305	0.4418	41.040	41.040×10^{-3}
10	4.080	0.5454	50.670	50.670×10^{-3}
11	4.937	0.6600	61.310	61.310×10^{-3}
12	5.875	0.7854	72.960	72.960×10^{-3}
14	8.000	1.0690	99.350	99.350×10^{-3}
16	10.440	1.3960	129.550	129.550×10^{-3}
18	13.220	1.7670	164.180	164.180×10^{-3}
20	16.320	2.1820	202.680	202.680×10^{-3}
22	19.750	2.6400	245.280	245.280×10^{-3}
24	23.500	3.1420	291.850	291.850×10^{-3}
26	27.580	3.6870	342.520	342.520×10^{-3}
28	32.000	4.2760	397.410	397.410×10^{-3}
30	36.720	4.9090	456.020	456.020×10^{-3}
32	41.780	5.5850	518.870	518.870×10^{-3}
34	47.160	6.3050	585.680	585.680×10^{-3}
36	52.880	7.0690	656.720	656.720×10^{-3}

1 Gallon = 3.785 liters
1 Meter = 3.281 feet
1 Gallon water weighs 8.33 lbs. = 3.779 kilograms
1 Liter water weighs 1 kilogram = 2.205 pounds
1 Gallon per foot of depth = 12.419 liters per foot of depth
1 Gallon per meter of depth = 12.419×10^{-3} cubic meters per meter of depth

INITIAL DEVELOPMENT WATER

WATER LEVEL (TOIC) 9.92'
WELL DEPTH (TD) 21.93' firm bottom
COLOR brown
ODOR none
CLARITY poor

FINAL DEVELOPMENT WATER

WATER LEVEL (TOIC) 10.02' @1242
WELL DEPTH (TD) 21.93'
COLOR clear
ODOR none
CLARITY good

DESCRIPTION OF DEVELOPMENT TECHNIQUE surge and purge with 12V pump.

WELL DEVELOPMENT - PARAMETER MEASUREMENTS

MW-07

TIME	TOTAL VOL. WITHDRAWN		pH	COND. (µmhos/cm)	TEMP. (°C/°F)	TURB. (NTU)	COMMENTS
	GALS.	BORE VOL.					
1130	0	0	6.74	1510	12.0	>1000	flow rate = .77 gpm
1137	5	2.5	6.61	1586	12.9	>1000	water level dropping slowly
1144	10	5	6.59	~~1441~~	13.1	>1000	
1149	15	7.5	6.54	1567	13.2	>1000	clarity is improving
1155	20	10	6.55	1582	13.3	>1000	
1202	25	12.5	6.56	1536	13.5	>1000	
1207	30	15	6.54	1549	13.4	>1000	continuing to clear and more
1213	35	17.5	6.58	1482	13.2	153	quickly
1219	40	20	6.53	1472	13.3	15.1	increased flow rate to max.
1228	50	25	6.51	1592	13.1	387	development complete

DEVELOPED BY: Megan Frondoniak/Rick Watt

DATE 12/4/08

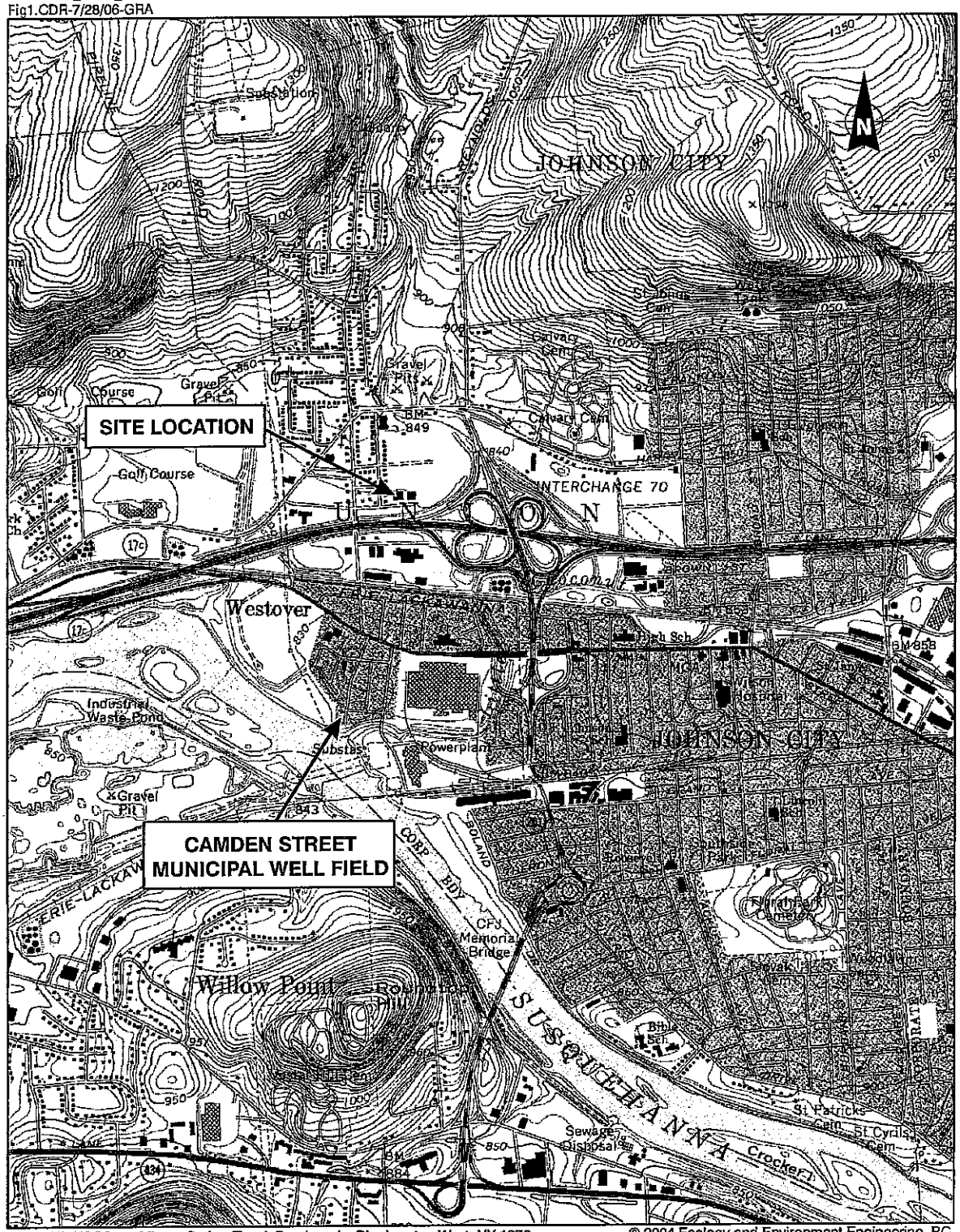
Subslab Depressurization Systems and Miscellaneous Construction
Bright Outdoors Site – NYSDEC Site No. 7-04-023
Johnson City, New York
January 2010
(002700.DC21.02)

Limited Site Data Information

Figure 1

General Site Location Map

02:000699_NV15_03-B1478
Fig1.CDR-7/28/06-GRA



SOURCE: USGS 7.5 Minute Series (Topo) Quadrangle: Binghamton West, NY 1976;
USGS 7.5 Minute Series (Topo) Quadrangle: Castle Creek, NY 1976.

SCALE 1:24,000

0 ½ 1 Mile

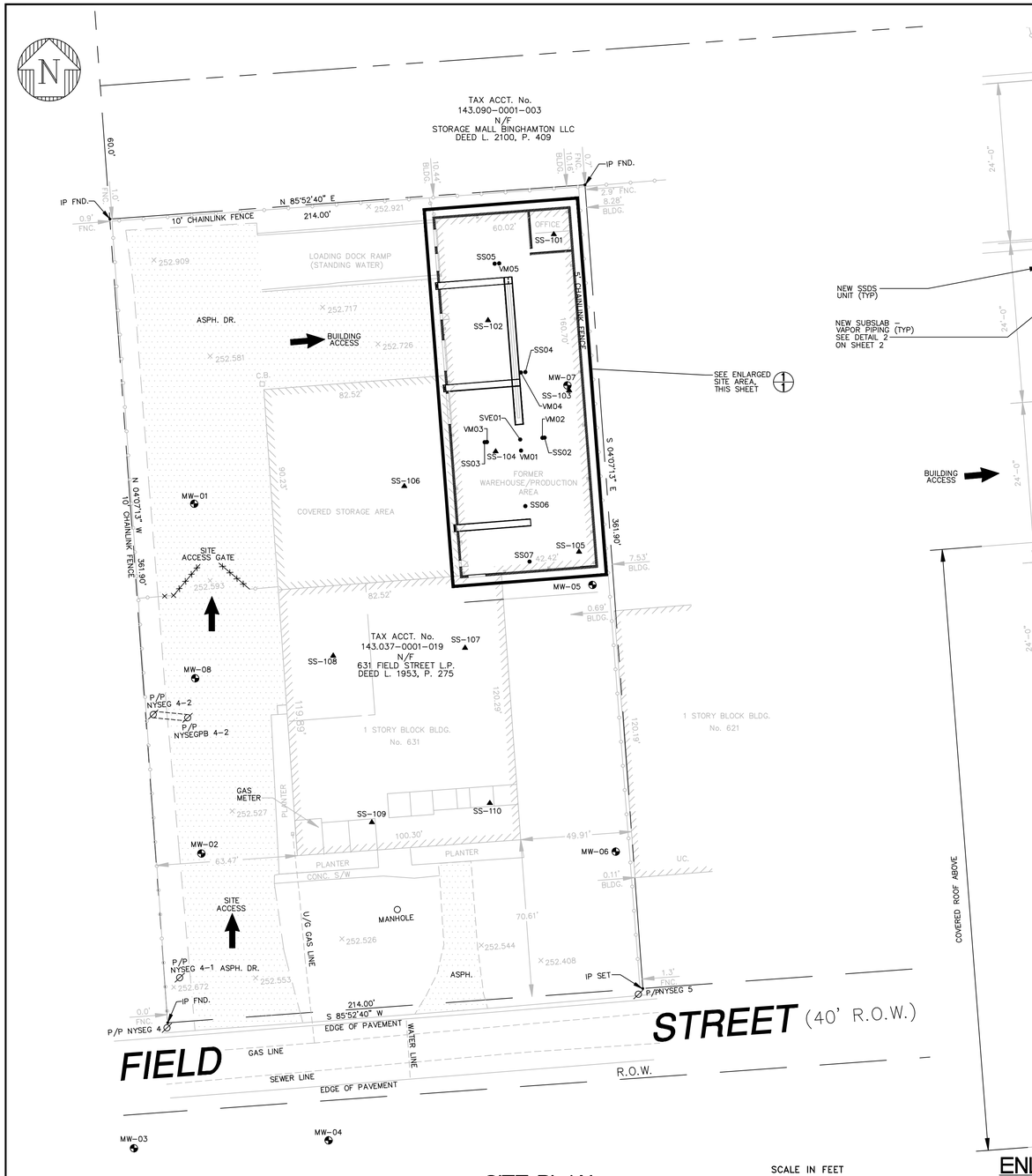
0 .5 1 Kilometer

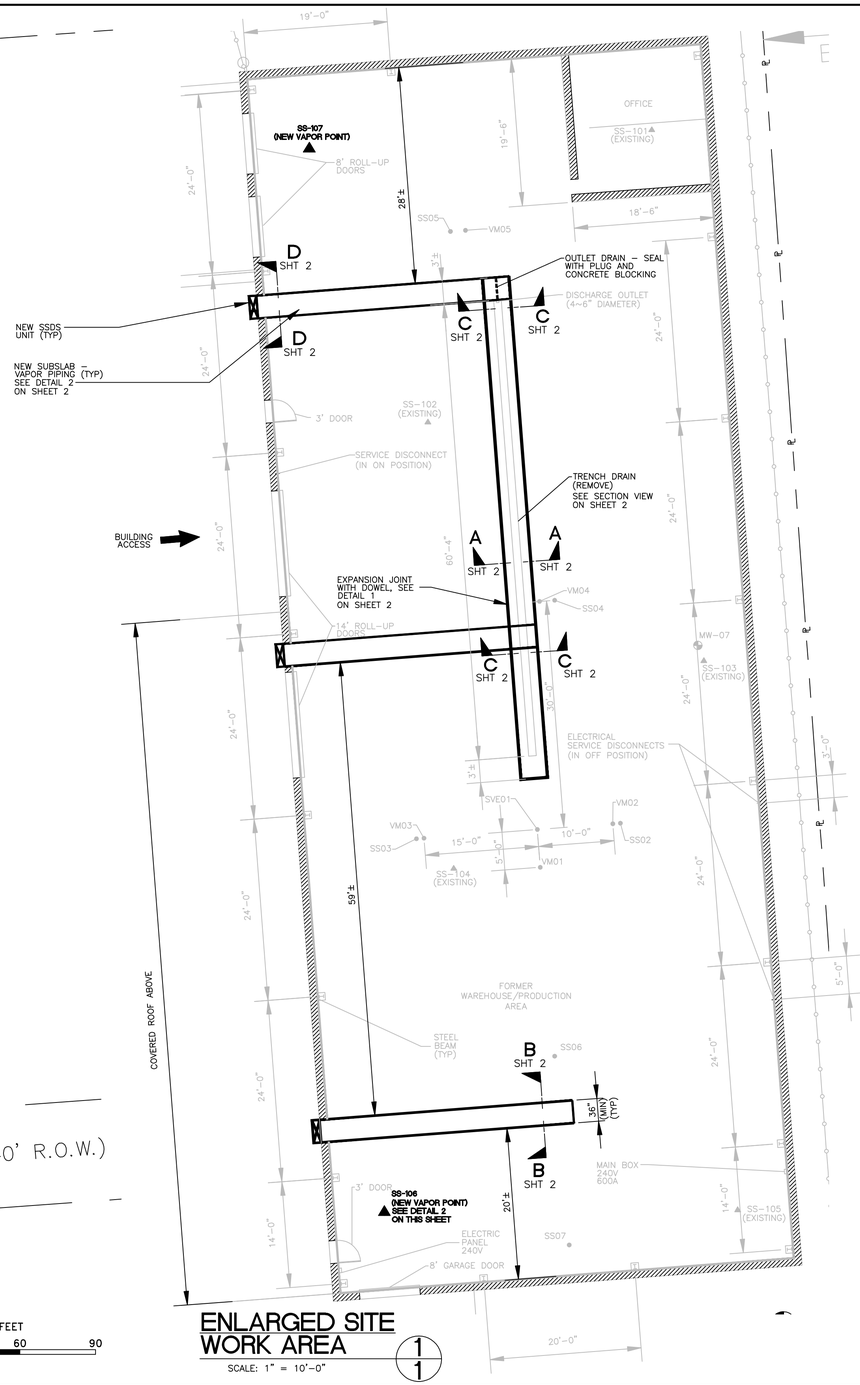
Figure 1 **Site Location Map**
Former Bright Outdoors Site
Johnson City, New York

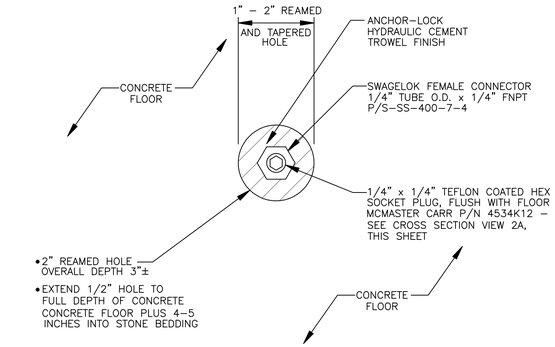
Subslab Depressurization Systems and Miscellaneous Construction
Bright Outdoors Site – NYSDEC Site No. 7-04-023
Johnson City, New York
November 2009
(002700.DC21.02)

Construction Drawings

Drawings 1 & 2







VAPOR MONITORING POINT PLAN VIEW

SCALE: 6" = 1'-0"

2/1

VAPOR MONITORING POINT CROSS SECTION

SCALE: 6" = 1'-0"

2A/1

SITE PLAN

SCALE: 1" = 30'-0"

SCALE IN FEET
0 30 60 90

ENLARGED SITE WORK AREA

SCALE: 1" = 10'-0"

1/1

LEGEND

MW-06 ⊕	MONITORING WELL & No.
× 252.672	SPOT ELEVATION (METRIC)
	CHAINLINK FENCE
	PROPERTY LINE
	RIGHT OF WAY
	UNDERGROUND UTILITY
SS06 ●	PILOT STUDY SUB–SLAB MONITORING POINT
VM02 ●	PILOT STUDY VAPOR MONITORING POINT
SVE01 ●	PILOT STUDY SOIL VAPOR EXTRACTION WELL
SS-109▲	PERMANENT SUB–SLAB VAPOR MONITORING POINT

NOTES:

1. HORIZONTAL INFORMATION SHOWN HEREON IS REFERENCED TO THE NAD'83 NEW YORK CENTRAL ZONE. VERTICAL INFORMATION SHOWN HEREON IS REFERENCED TO THE NAVD'88.
2. SITE FEATURES INSIDE THE FORMER WAREHOUSE/PRODUCTION AREA BUILDING WERE MEASURED IN THE FIELD, AND THEIR LOCATIONS ARE APPROXIMATE.

DWG NO.	DATE	DESCRIPTION
SU1	1/8/09	INSTRUMENT SURVEY FROM LARSEN ENGINEERS

REFERENCE DRAWINGS

NO.	DATE	DWN	APP'D	DESCRIPTION
B	1-5-10	KMK	MGS	RE-ISSUED ELECTRONICALLY FOR FINAL REVIEW
A	11-10-09	KMK	MGS	ISSUED ELECTRONICALLY FOR DRAFT REVIEW

REVISIONS

ecology and environment engineering p.c.

DESIGNED BY	CHECKED BY
M. STEFFAN	M. STEFFAN
DRAWN BY	APPROVED BY
KM KRAJEWSKI	DJ MILLER P.E.

FINAL

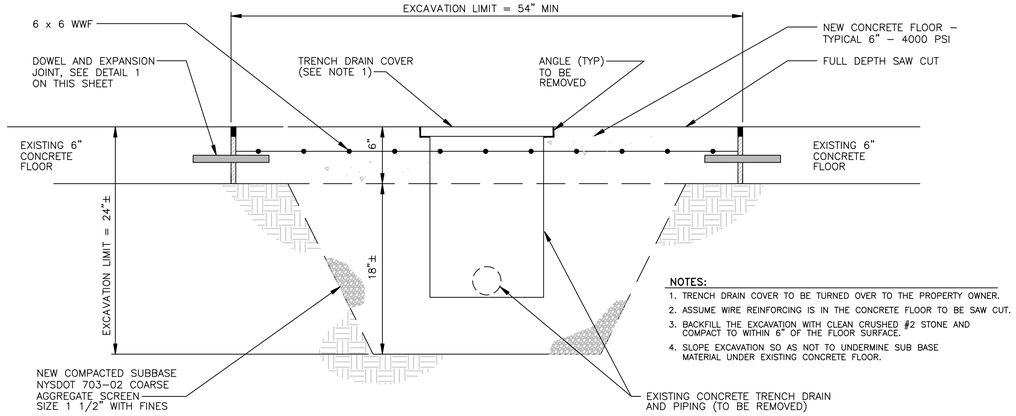
FORMER BRIGHT OUTDOORS SITE

BROOME COUNTY — NEW YORK

SUBSLAB DEPRESSURIZATION SYSTEMS AND MISCELLANEOUS CONSTRUCTION

SCALE	FIRST ISSUED	C.A.D. FILE NO.	DRAWING NO.	REV.
NOTED	11-10-09	SSDS Const.dwg	Sheet 1 of 2	B

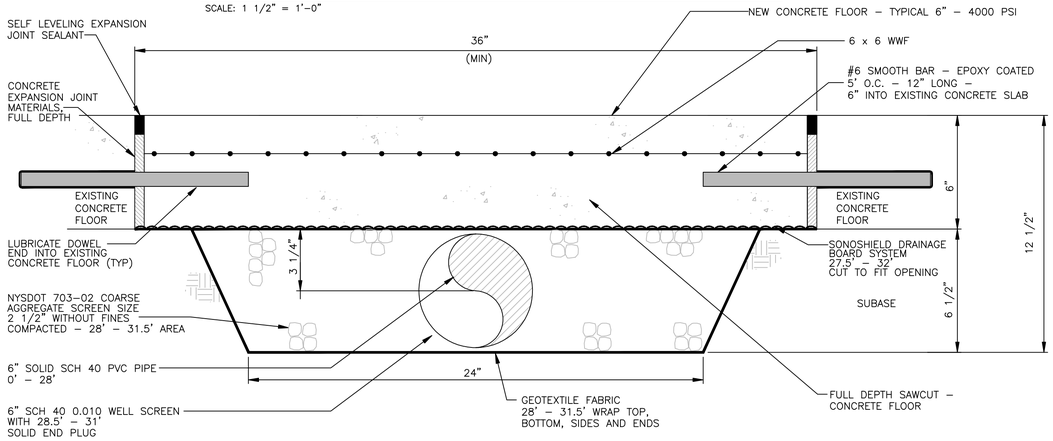
F:\Bright Outdoors\Revised Final Review 12-28-09\SSDS Construction.dwg
BUFFplot: 1/5/10 KMK



NOTES:
1. TRENCH DRAIN COVER TO BE TURNED OVER TO THE PROPERTY OWNER.
2. ASSUME WIRE REINFORCING IS IN THE CONCRETE FLOOR TO BE SAW CUT.
3. BACKFILL THE EXCAVATION WITH CLEAN CRUSHED #2 STONE AND COMPACT TO WITHIN 6" OF THE FLOOR SURFACE.
4. SLOPE EXCAVATION SO AS NOT TO UNDERMINE SUB BASE MATERIAL UNDER EXISTING CONCRETE FLOOR.

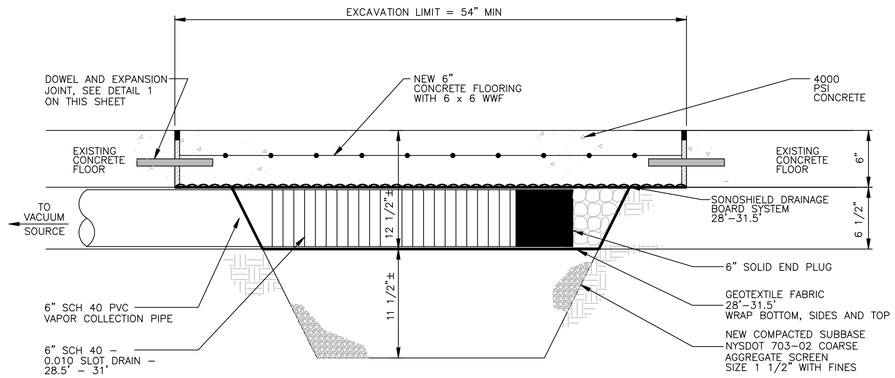
EXISTING TRENCH DRAIN REMOVAL SECTION A-A

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



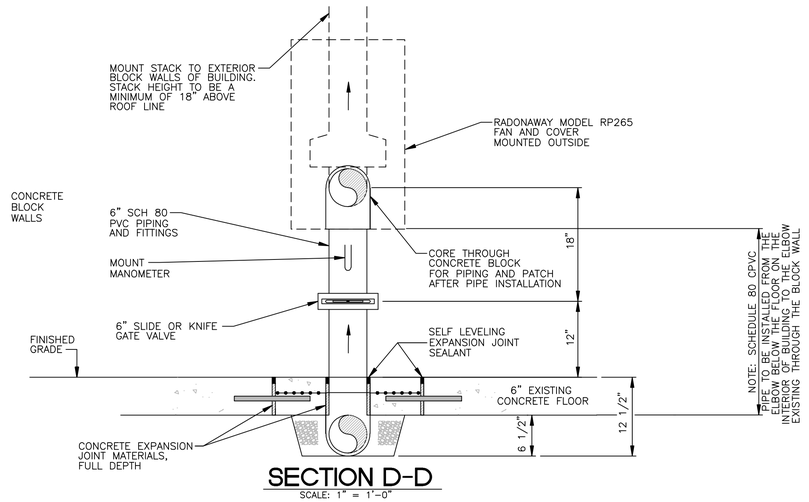
BELOW FLOOR HORIZONTAL VAPOR COLLECTION AT SUBSLAB VAPOR PIPING SECTION B-B

SCALE: 3" = 1'-0"



HORIZONTAL VAPOR PIPE TRENCH DRAIN CROSSING SECTION C-C

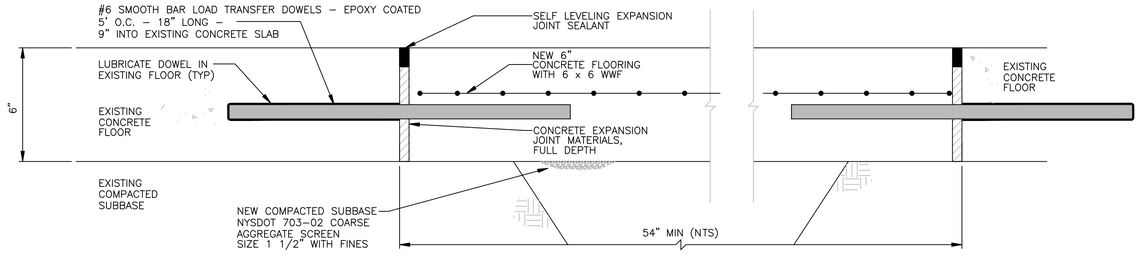
SCALE: 1 1/2" = 1'-0"



SECTION D-D

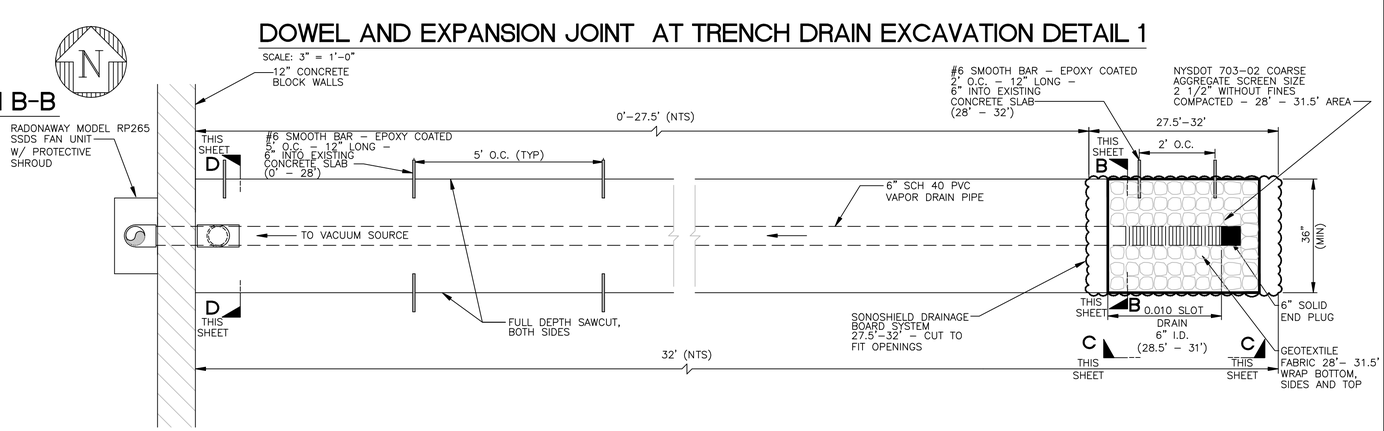
SCALE: 1" = 1'-0"

TYPICAL FOR ALL THREE VAPOR EXTRACTION PIPING INSTALLATIONS.



DOWEL AND EXPANSION JOINT AT TRENCH DRAIN EXCAVATION DETAIL 1

SCALE: 3" = 1'-0"



SUBSLAB - VAPOR PIPING DETAIL 2 - TYPICAL @ ALL 3 LOCATIONS

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

NOTES:
1. SSDS VERTICAL VENT STACKS EXTEND 18" ABOVE ROOF LINE.
2. LOCATION OF ELECTRICAL SOURCE TO BE DETERMINED.
3. ELECTRICAL SOURCE REQUIREMENTS FOR THE SSDS UNITS ARE SINGLE PHASE – 120 VOLTS.

GENERAL NOTES:
1. THE CONTRACTOR SHALL VERIFY ALL LINES, GRADES AND DIMENSIONS IN THE FIELD PRIOR TO CONSTRUCTION.
2. ASSUME WIRE REINFORCING WHEN SAW-CUTTING INTO EXISTING FLOOR.
3. LUBRICATE DOWEL INTO EXISTING CONCRETE SLAB.
4. SELF LEVELING EXPANSION JOINT SEALANT DEPTH IS A MINIMUM TWO TIMES WIDTH OF EXPANSION JOINT. INSTALL PER MANUFACTURER INSTALLATION INSTRUCTIONS.
5. FINISH NEW CONCRETE TO MATCH EXISTING SURFACE.

REFERENCE DRAWINGS

DWG NO.	DATE	DESCRIPTION

REVISIONS

NO.	DATE	DWN	APP'D	DESCRIPTION
B	1-5-10	KMK	MGS	RE-ISSUED ELECTRONICALLY FOR FINAL REVIEW
A	11-10-09	KMK	MGS	ISSUED ELECTRONICALLY FOR DRAFT REVIEW

ecology and environment engineering p.c.

DESIGNED BY	CHECKED BY
M. STEFFAN	M. STEFFAN
DRAWN BY	APPROVED BY
KM KRAJEWSKI	DJ MILLER P.E.

FINAL

FORMER BRIGHT OUTDOORS SITE

BROOME COUNTY NEW YORK

DETAILS AND SECTIONS

SCALE	FIRST ISSUED	C.A.D. FILE NO.	DRAWING NO.	REV.
NOTED	11-10-09	SSDS Const.dwg	Sheet 2 of 2	B

F:\Bright Outdoors\Revised Final Review 12-28-09\SSDS Construction.dwg
BUFplot: 1/5/10 KMK