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23p

Prepared for:

General Electric Company
Corporate Environmental Programs
Albany, NY

WORK PLAN FOR SUB-SLAB DEPRESSURIZATION

SHERMAN PARK FACILITY
600 SHERMAN DRIVE
INDIANAPOLIS, INDIANA

Prepared by:

Geosyntec consultants

engineers | scientists | innovators
130 Research Lane, Suite 2
Guelph. Ontario N1G 5G3

Project Number TR0114.07

August 6, 2007

LIST OF FIGURES

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Consultants, Inc., March 19, 2007 (Indoor Air Work Plan) that specifies the collection of indoor air samples in the west side of the main building and the concurrent collection of an outdoor air sample outside the northwest corner of the main building. Air sampling locations are shown on Figure 2. The Indoor Air Work Plan was developed in consultation with IDEM and in accordance with the IDEM VI Guidance.

Geosyntec conducted the air sampling on May 7 and 8, 2007. TCE was detected in two of the three indoor air samples (IA-02 and IA-03) at 26 and 23 micrograms per cubic meter [$\mu g/m^3$], respectively. All other VOCs detected in the indoor air samples do not exceed the IDEM VI Guidance Action Levels for commercial buildings. The results of the indoor air sampling were provided to IDEM within the *Report of Indoor Air Sampling at the Sherman Park Facility, Geosyntec Consultants, Inc., June 11, 2007.*

2.3 Sub-slab Vapor Sampling

To document the concentrations of CVOCs beneath the building floor during the operation of the SSD system, sub-slab vapor samples will be collected after 30 and 90 days of operation. Sub-slab samples will be collected from the existing vapor probes SSP-11, SSP-12, SSP-13, SSP-15 and SSP-16 following the methods described below.

2.3.1 Sub-slab Vapor Sampling Procedure

Vapor probes will be purged prior to sampling, and field screening data will be collected to assess the representativeness of the sample. Purging will be conducted using a portable vacuum pump. The pump will be used to fill a one-liter Tedlar bag three to five times and screening the bag contents using a handheld PID and O_2/CO_2 meter to confirm stable readings before sub-slab sample collection. The probes will be leak checked using helium as follows. A shroud will be placed over each probe and helium will be added within the shroud as a tracer gas. The concentration of helium in the shroud will be recorded with a portable helium detector. Sub-slab vapor samples will be collected into Tedlar™ bags and screened to confirm that helium in the sample is less than 5% of the concentration in the shroud, verifying that atmospheric air is not leaking through vapor probe seal or fittings. If the helium concentration is above 5%, the probe will be re-sealed or replaced, as needed, to obtain a representative sample of soil gas.

After purging, a soil gas sample will be collected directly into a batch-certified 1-liter mini-Summa™ canister with a 5-micron in-line filter. The canister will be connected directly to the probe via a "T"-fitting prior to initiating purging. The valve to the vacuum pump will be closed prior to opening the canister valve to collect the sample. Initial and final vacuum levels in the Summa canister will be measured and recorded. Summa™ canisters will be labeled and shipped to the analytical laboratory via overnight courier under chain of custody at ambient temperature. One blind field duplicate sample will be collected for every 10 investigative samples to assess reproducibility.

2.3.2 Laboratory Methods

All sub-slab samples will be analyzed for a full list of VOCs by Severn Trent Laboratories (STL) of Burlington, Vermont using modified EPA Method TO-15 with 5 parts per billion by volume (ppb_v) quantitation limits. Summa™ canisters will be batch-certified by STL prior to shipping to the site.

2.3.3 Data Validation Procedure

Geosyntec will validate the analytical data. Validation will include review and evaluation of all individual sample results, chain-of-custody forms, canister vacuums, sample holding times, quantitation limits, and results of QA/QC sample analyses.

operation of the SSD system. After SSD shut down, indoor air samples will be collected during the "heating season" and the subsequent "summer season" according to the methodology described above. The SSD system will remain shut down if the indoor air results from both events are less then the Chronic (25 year) Commercial Indoor Air Action Level for Site related constituents. If indoor air concentrations are not less than the Chronic (25 year) Commercial Indoor Air Action Levels, the SSD system operation will continue.

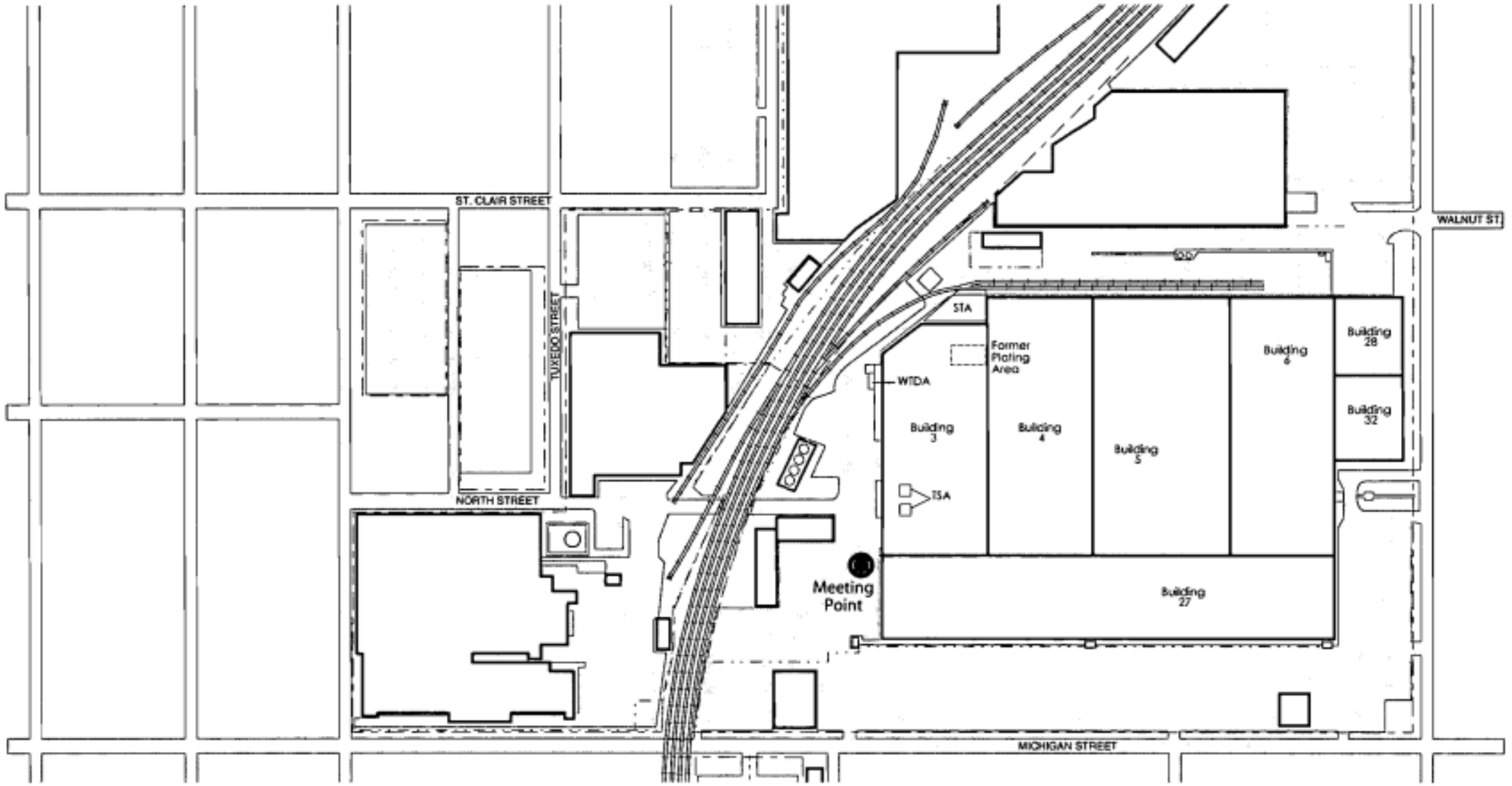
3.3 Reporting

Geosyntec will prepare a report upon completion of the 90 day system operation and associated monitoring. The report will include as-built documentation, a description of the monitoring methodologies, operating data, monitoring results, an evaluation of the SSD system performance and the air sampling results. The report will also include a description of future operation, monitoring, and maintenance activities that will routinely performed if the indoor air sampling results are below the Chronic (25 year) Commercial Indoor Air Action Level, or recommendations for system modification if necessary.

4.0 SCHEDULE

Construction of the SSD system will be initiated 4 weeks following IDEM's approval of this Work Plan. It is anticipated that the system installation will take approximately 3 weeks. Sub-slab samples will be collected following 30 and 90 days of system operation, and indoor air samples will be collected 90 days after activation of the SSD system. The report of findings will be provided to IDEM within 60 days of receipt of the indoor air analytical data.

FIGURES



50 0 50 100 150 200
(scale in feet)

Site Location:

Legend:

fence

property line

paved area

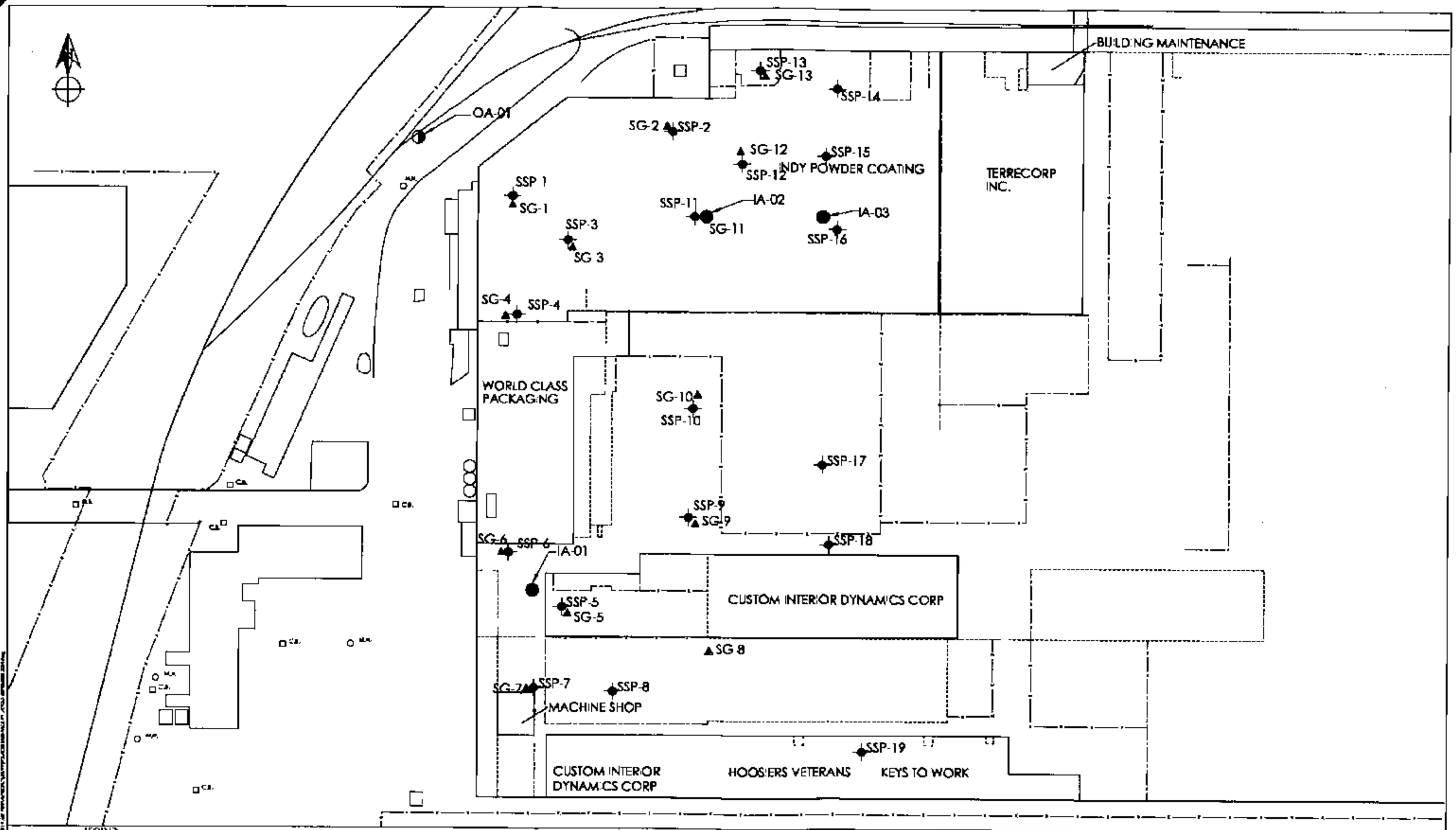
Site Map
Sherman Park Facility, Indianapolis, Indiana

Geosyntec consultants

Guelph | July 2007

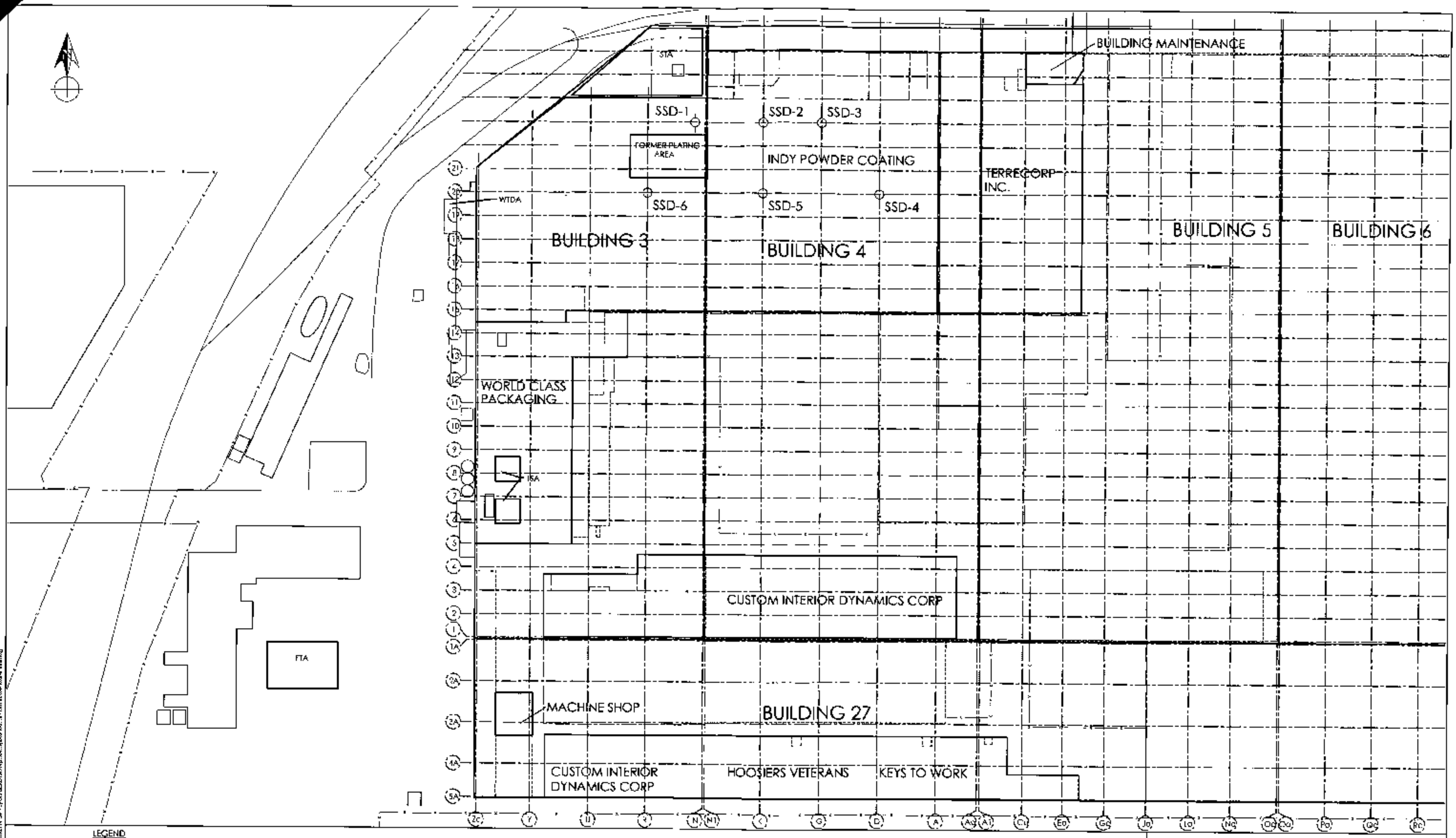
Figure 1

Indianapolis layout updated_zoom.ai



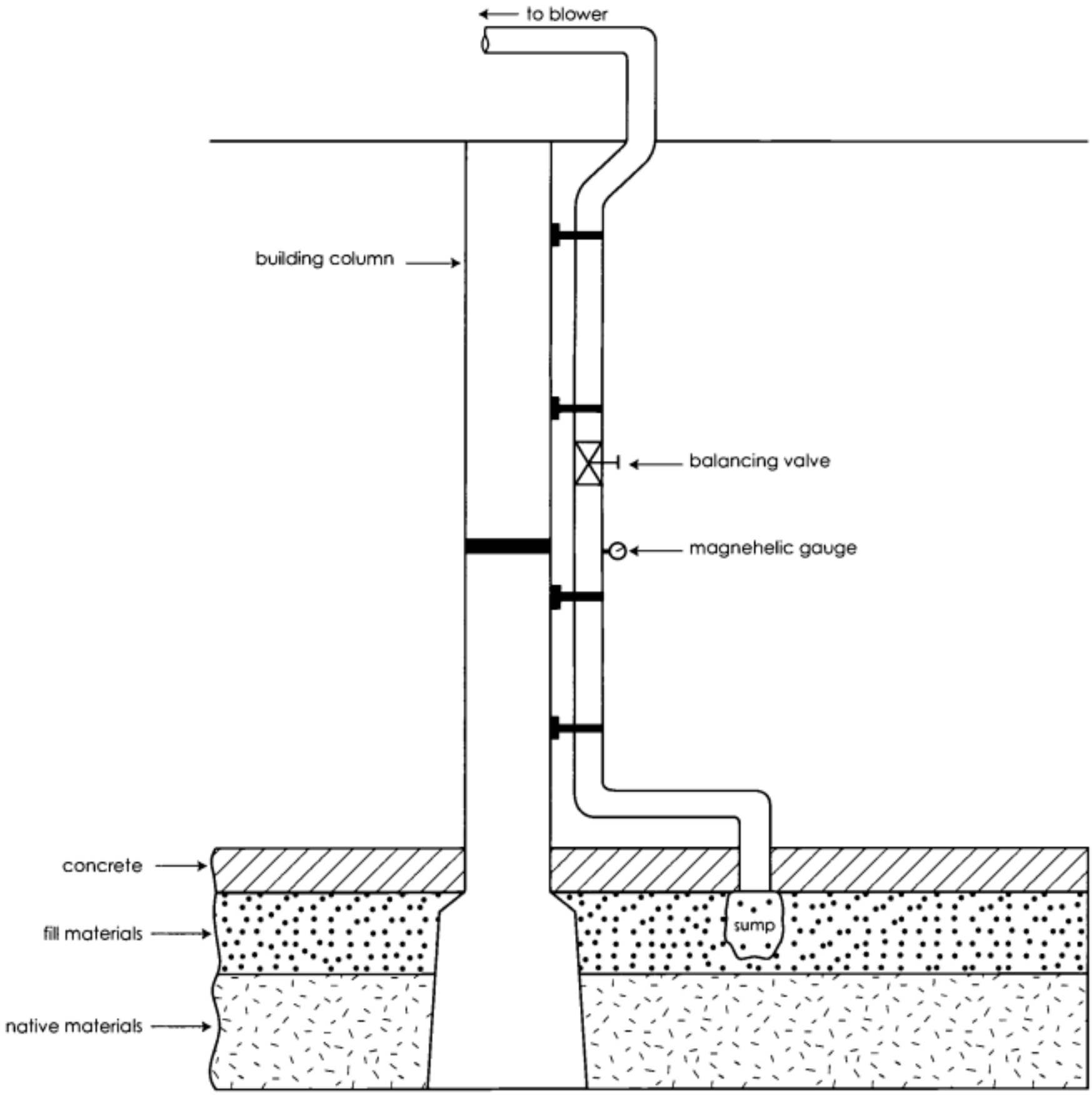
Sub-Slab, Soil Gas and Air Sampling Locations
Sherman Park Facility, Indianapolis, Indiana

July 2007 | Figure 2 | Geosyntec consultants



Proposed Sub-Slab Depressurization Locations
Sherman Park Facility, Indianapolis, Indiana

July 2007	Figure 4	Geosyntec consultants



Vapor Extraction Point Construction Schematic
Sherman Park Facility, Indianapolis, Indiana

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Figure **5**

sub-slab depressurization.cdr

APPENDIX A

FIELD FORMS AND CHECKLISTS

Start Up, Day 30 and Day 90 Monitoring:

Geosyntec consultants

130 Research Lane, Suite 2
Guelph, Ontario, Canada N1G 5G3
(519)822-2230 Fax (519)822-3151

Date _____

Checklist Completed By _____

Project Number _____

Property Location _____

System Installation Date _____

The purpose of this form is to document the operation and maintenance of the sub-slab depressurization system to provide assurance that the system is functioning as designed or identify and execute any actions required to achieve the mitigation of subsurface vapor intrusion of volatile organic compounds to indoor air

1. MITIGATION SYSTEM INSPECTION

External Piping

Vent pipes are securely fastened to building	☐ yes ☐ no
No visible openings or breaks in the pipe system	☐ yes ☐ no ☐ N/A
Rain cap present and intact at discharge	☐ yes ☐ no
Inspection of the exhaust point verified that no air intakes have been located nearby	☐ yes ☐ no
The sealing/caulking around wall penetrations is intact	☐ yes ☐ no

Comments / Action Items

_____

_____

_____

Blower

Check oil (open lower side plug)	☐ yes ☐ refill
Change oil (see operation manual)	☐ yes ☐ no
Check belt tension and wear on blower	☐ OK ☐ adjusted
De-scaled blower	☐ yes ☐ no
Grease blower bearings	☐ yes ☐ no
Clean/repair inlet filter and demister (pressure change > 15 in. H20)	☐ yes ☐ no
Water level in knockout pot (check site glass)	☐ yes ☐ no
Test water knockout transfer pump	☐ yes ☐ no
Clean sump, site glass, etc (as needed)	☐ yes ☐ no
No visible damage to fan or cover	☐ yes ☐ no

Comments / Action Items

_____

_____

_____

Internal Piping

Vertical and horizontal pipe runs are secured, including at all penetration points	☐ yes ☐ no
The sealing/caulking is intact around the extraction points	☐ yes ☐ no
Mitigation system operation placard present and visible/legible	☐ yes ☐ no
Contains description of major components, valid contact number and instructions for occupant inquiries and/or system failure	☐ yes ☐ no
Magnehelic gauge present and intact at each extraction point	☐ yes ☐ no

Comments / Action Items

_____

_____

_____

Start Up, Day 30 and Day 90 Monitoring:

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Electrical

Electrical connections secured	☐ yes ☐ no
Junction boxes are closed	☐ yes ☐ no
Conduit is supported	☐ yes ☐ no

Comments / Action Items

2. OPERATIONAL CHECKS

Blower is operating

Noise and Vibration within normal range	☐ yes ☐ no
Alarm sounds when blower is turned off	☐ yes ☐ no

Vacuum gauge indicating negative sub-slab pressure at vapor extraction points

Location: **SSD-1** Vacuum _____ in H_2O, adjusted valve V-1?	☐ yes ☐ no
Location: **SSD-2** Vacuum _____ in H_2O, adjusted valve V-2?	☐ yes ☐ no
Location: **SSD-3** Vacuum _____ in H_2O, adjusted valve V-3?	☐ yes ☐ no
Location: **SSD-4** Vacuum _____ in H_2O, adjusted valve V-4?	☐ yes ☐ no
Location: **SSD-5** Vacuum _____ in H_2O, adjusted valve V-5?	☐ yes ☐ no
Location: **SSD-5** Vacuum _____ in H_2O, adjusted valve V-6?	☐ yes ☐ no
Location: **Blower** Vacuum _____ in H_2O, adjusted valve V-7?	☐ yes ☐ no

Effluent Monitoring (discharge of blower)

Flow: **Blower** _____ ft/min	
PID reading with 100 ppm isobutlyene _____ ppm, calibrate?	☐ yes ☐ no
PID reading with outdoor air _____ ppm, calibrate?	☐ yes ☐ no
PID: **Blower** _____ ppmv	

Comments / Action Items

3. ADDITIONAL ACTION ITEMS/COMMENTS/COMPLETION DATES

Start Up, Day 30 and Day 90 Monitoring:

Geosyntec consultants

130 Research Lane, Suite 2
Guelph, Ontario, Canada N1G 5G3
(519)822-2230 Fax (519)822-3151

Date	Time	Well ID	Vacuum (in H2O)	Flow (ft/min)	PID 1st Bag	PID 2nd Bag	PID 3rd Bag
Vapor Extraction Points							
		SSD-1					
		SSD-2					
		SSD-3					
		SSD-4					
		SSD-5					
		SSD-6					
Date	**Time**	**Well ID**	**Vacuum (in H2O)**	**Flow (minutes)***	**PID 1st Bag**	**PID 2nd Bag**	**PID 3rd Bag**
Sub-Slab Vapor Probes							
		SSP-11					
		SSP-12					
		SSP-13					
		SSP-15					
		SSP-16					

Notes:
minutes required to empty a 1 liter tedlar bag

DAILY FIELD REPORT

GEOSYNTEC CONSULTANTS
130 Research Lane, Suite 2
Guelph, Ontario, Canada N1G 5G3
(519)822-2230 Fax (519)822-3151

Project Name: ______________________ **Date:** ____________________ **Page** ___ **of** ___

Project Number: ______________________ **Primary Activities:** ______________________

Field Personnel: ______________________ ______________________

______________________ ______________________

Recorded By: ______________________ ______________________

Weather: ____

Time	Description of activities - ☐location of work, work performed, equipment & personnel used, incidental information ☐

Geosyntec consultants

130 Research Lane, Suite 2
Guelph, Ontario, N1G 5G3
(519) 822-2230 Fax (519) 822-3151

SOIL GAS PROBE MEASUREMENTS

Project Name: _____
Project Number: _____
Phase Number: _____
Date: _____ Weather: _____
Field Personnel: _____
Recorded By: _____
Tracer Gas: ☐ Helium ☐ Other _____

Probe No _____ ☐ Sub-slab probe ☐ Soil gas probe
PID Model Number: _____ Lamp: 10.6 / 11.7 eV
PID Serial Number: _____
Landtech GEM 2000 Landfill Gas Meter Serial Number: _____
Helium detector (model and serial number) _____
Air Temperature _____ (°C/°F) Atmospheric Pressure _____ (in. Hg)

Surface Type: ☐ Asphalt ☐ Concrete ☐ Grass ☐ Other _____
Surface Thickness _____ inches/centimeters ☐ Unknown
(ie. asphalt or concrete surface)

1 Casing Volume
☐ Sub-slab <0.1 L
Soil gas probe _____(L)

Start of Pneumatic Testing: _____

Elapsed Time (min.)	Pump Flow Rate (LPM)	Well Head Vacuum inches H_2O
	0.2	
	0.5	
	1.0	

Initial Pressure/ Vacuum (Prior to Pumping)		Time		Field tubing blank reading (ppm_v)		Time	

Shutin test prior to pnuenatic test OK ☐ @ _____
Shutin test prior to purge OK ☐ @ _____
Shutin test prior to sample collection OK ☐ @ _____

Date	Start Time	End Time	Elapsed Time (min.)	Bag Volume (L)	Purge Rate (LPM)	Cumulative Volume (L)	Well Head Vacuum ("Hg)	Well Head Vacuum (H_2O)	CH_4 (%)	CO_2 (%)	O_2 (%)	Tracer Gas (%) Shroud Min	Tracer Gas (%) Shroud Max	Tracer Gas (%) Sample	VOCs by PID (ppm_v)

Date	Time	Sample ID	Summa Canister ID	Flow Controller #	Vacuum Gauge #	Initial Vacuum (in Hg)	Final Vacuum (in. Hg)

Comments: