APPENDIX M

SSDS As-Built Drawings – Building 6

THE SHOPS AT ATLAS PARK **BUILDING 6 SUB-SLAB DEPRESSURIZATION SYSTEM AS-BUILT DRAWINGS QUEENS, NEW YORK**



Base Map taken from New York USGS Quadrangle Map - Jamaica





ELANGAN ENGINEERING & ENVIRONMENTAL SERVICE 21 Penn Plaza 360 West 31st Street, 8th Floor New York, NY 10001-2727 P: 212.479.5400 F: 212.479.5444 www.langan.com JOEL B. LANDES 12/27/00 PROFESSIONAL ENGINEER N.Y. LIC. No.076348 NEW JERSEY PENNSYLVANIA NEW YORK CONNECTICUT FLORIDA VJ Certificate of Authorization No: 24GA2

Project

LIST OF DRAWINGS			
DRAWING NAME	SCALE	DRAWING NUMBER	
COVER SHEET	NOT TO SCALE	B6-SSDS-0	
SUB-SLAB DEPRESSURIZATION SYSTEM LAYOUT (AS-BUILT)	1" = 16'	B6-SSDS-1	
BUILDING 6 BASEMENT PLAN (AS-BUILT)	1" = 16'	B6-SSDS-2	
BUILDING 6 LEVEL 01 PLAN (AS-BUILT)	1" = 16'	B6-SSDS-3	
BUILDING 6 MEZZANINE PLAN (AS-BUILT)	1" = 16'	B6-SSDS-4	
BUILDING 6 LEVEL 02 PLAN (AS-BUILT)	1" = 16'	B6-SSDS-5	
BUILDING 6 LEVEL 03 PLAN (AS-BUILT)	1" = 16'	B6-SSDS-6	
BUILDING 6 ROOF PLAN (AS-BUILT)	1" = 16'	B6-SSDS-7	
SUB-SLAB DEPRESSURIZATION SYSTEM DETAIL (AS-BUILT)	AS SHOWN	B6-SSDS-8	

SITE KEY PLAN





Description Revisions

Date

OEL B. LANDES 12/27/06 PROFESSIONAL ENGINEER N.Y. LIC. No.076348 JOEL B. LANDES

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Drawing Title	Project No. SSS5107	wing No.
PS AT ATLAS ARK LENDALE NEW YORK BUILDING 6 SUB-SLAB DEPRESSURIZATION SYSTEM LAYOUT (AS-BUILT)	Date 12/22/06 Scale 1" = 16' Drn. By JH Last Revised	© 2005 Langan Engineering and Environment 1 Ot 8



OPS AT ATLAS PARK	BUILDING 6 BASEMENT PLAN (AS-BUILT)	12/22/06 Scale 1*=16' Drn. By	B6-SSDS-2
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OPS AT ATLAS PARK	LEVEL 01 PLAN (AS-BUILT)	12/22/06 Scale 1" = 16' Drn. By JH	B6-SSDS-3
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December 30, 2005

Mr. Jamie P. Barr Assistant Project Manager *LANGAN* | *ENGINEERING & ENVIRONMENTAL SERVICES* 21 Penn Plaza 360 West 31st Street, 8th Floor New York, NY 10001-27278, via email jbarr@Langan.com

Re: Atlas Park Sub-Slab Evaluation and Smoke Test Buildings 4 & 6, Glendale, Queens, NY LEA Project #05-323

Dear Mr. Barr:

On December 14, 2005, Scott Yanuck and Nicholas Mouganis completed evaluation of the effectiveness of the existing sub-slab venting (depressurization) system by measuring the created pressure field. Upon inspection of the buildings, we found all sub-slab systems operational, all suction pits completed, and the majority of the joints in the slab sealed.

This evaluation consisted of a series of sub-slab air communication tests to measure the pressure differential created by the system in operation at various points in each of two buildings. In the process, we determined the radius of influence for each suction pit. Small diameter test holes were drilled into the slab at strategic measuring point locations and at varying distances from each suction pit. Differential pressure measurements at these points enabled us to characterize, by interpolation or extrapolation, the extent and intensity of the active pressure field. Measurement was by digital manometer. This procedure was repeated until sufficient data was gathered to indicate the perimeter of the detectable influence area (minimum .001 water column inches). Test holes were filled with backer rod and urethane caulk at conclusion of testing.

All measurements are documented in this report and attached pressure field map. Based on inspection of the systems, measurements and smoke testing completed, we have the following comments and conclusions:

- 1. An inspection of risers and suction pits found all locations complete, with no deficiencies noted.
- 2. A number of deficiencies in the slab were noted near suction pits 6-1 and 6-2. These consisted of non-caulked joints along the parking garage wall in the 6-2 floor and several areas missing a concrete slab in the 6-1 floor. Sewer or drainage sumps noted near 6-1 are not connected with the sub slab, as smoke did not get drawn into openings at grade.
- 3. With the exception of deficiencies noted in the concrete slabs near suction pits 6-1 and 6-2, smoke testing did not observe any drawdown of smoke into the slab along expansion joints, cracks, piping protrusions and other likely points of connection to the sub-slab.

4. A quantitative evaluation of the effectiveness sub-slab system to create a measurable negative pressure field that extends throughout the sub-slab(s) of each building found satisfactory negative pressure fields in slabs treated by suction pits 4-1 and 6-3. The slabs serviced by suction pits 6-1 and 6-2 failed the test. Vacuum measured at the pipe leading into suction pit 6-1 was 0.117 inches of water and was similarly low at 6-2. With a vacuum at the blower specified at 35 inches of water, there was an obvious system malfunction. There was no measurable negative pressure field beyond forty feet from suction pit 6-1. There was no measurable negative pressure field and beyond ninety feet from suction pit 6-2.

A re-evaluation of the effectiveness of suction pits 6-1 and 6-2 should be completed after repairs have been made to the system blower, valves and/or slab and joints. The actual date of system evaluation will be based on weather conditions favorable to performance of the tests in an environment open to the weather, e.g. in the absence of heavy winds that could affect the results of the evaluation.

We will document and report all points of connection or failure to the Langan site representatives. We require two sets of working size building foundation plan drawings indicating the suction pit locations. We also require the personnel or the means to switch the blowers off and on repeatedly during the course of the evaluation. Access to all areas and a means to reach piping is required and 110/120v power is assumed available to power our equipment. The evaluation requires the drilling of a series of ³/₄-inch diameter holes in the slab to allow for the temporary installation of a digital manometer. When done, all holes will be filled with urethane caulk.

If you have any questions, please contact me.

Respectfully submitted by, *Laurel Environmental Associates, Ltd.*

Cr Scott A. Yanuck

President

Attached:

Table I Photographs Sub-Slab Depressurization Sketches

TABLE I

Evaluation, of Sub-Slab System on December 14, 2005

Suction Po	int 6-1	
Location	Inches WC	Distance from Suction Point in feet
TP-6-1-1	< 0.001	40
TP-6-1-2	0.005	16
TP-6-1-3	0.004	20
TP-6-1-4	0.008	30
Suction Po	int 6-2	
Location	Inches WC	Distance from Suction Point in feet
TP-6-2-1	< 0.001	90
TP-6-2-2	0.002	55
TP-6-2-3	0.003	40
TP-6-2-4	0.026	20
TP-6-2-5	0.025	20
TP-6-2-1	< 0.001	90
TP-6-2-1	< 0.001	90
Suction Po	int 6-3	
Location	Inches WC	Distance from Suction Point in feet
TP-6-3-1	0 1 1 0	65
TP-6-3-2	0.055	120
TP-6-3-3	0.050	140
TP-6-3-4	0.068	148
TP-6-3-5	0.077	136
TP-6-3-6	0.095	100
TP-6-3-7	0.105	70
TP-6-3-8	0.040	112
TP-6-3-9	0.012	184
TP-6-3-10	0.009	168
TP-6-3-11	0.008	80
TP-6-3-12	0.009	96
Suction Po	int 4-1	
Location	Inches WC	Distance from Suction Point in feet
TP-4-1-1	0.445	56
TP-4-1-2	0.030	132
TP-4-1-3	0.150	104
TP-4-1-4	0.180	75
TP-4-1-5	0.185	128

WC = Water Column

TP = Test Point





Photo 2, Sealed and labeled test point



Photo 3, Smoke test of electrical conduits



Photo 4, unfinished slab in close proximity to Suction Point 6-1



ANY REVISIONS

S REQUIRE EDIT TO LAST REVISED DATE	21 Penn Plaza 360 West 31st Street, Suite 900 New York, NY 10001-2727 P: 212.479.5400 F: 212.479.5444 www.langan.com	THE SHOPS AT ATLAS PARK	Drawing Title ACTIVE SUB-SLAB DEPRESSURIZATION SYSTEM - BLDG 6	Project No. 5555107 Date 6/19/05 Scale 1" = 16' Drn. By JH	Drawing No.
Description No.	NEW JERSEY PENNSYLVANIA NEW YORK CONNECTICUT FLORIDA NJ Certificate of Authorization No: 24GA27996400			Last Revised 6/22/05	1 Of 3

Evaluation of Sub-Slab System, Building 6 on December 14, 2005

Location Inches WC Distance from Suction Point in feet



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April 26, 2006

Mr. Jamie P. Barr Assistant Project Manager *LANGAN* | *ENGINEERING & ENVIRONMENTAL SERVICES* 21 Penn Plaza 360 West 31st Street, 8th Floor New York, NY 10001-27278, via email jbarr@Langan.com

Re: Atlas Park Sub-Slab Evaluation and Smoke Test Buildings 6 & 7, Glendale, Queens, NY LEA Project #05-323

Dear Mr. Barr:

On April 12, 2006, Scott Yanuck and Brendan Moran completed evaluation of the effectiveness of the existing sub-slab venting (depressurization) system by measuring the created pressure field. Unlike our visit to the site on April 10, 2006, when none of the sub-slab depressurization systems were running, on the 12th, we found all sub-slab systems operational, all suction pits completed, and the majority of the joints in the slab sealed. Three areas were repaired by Laurel Environmental Associates, Ltd. to reduce the likelihood of system failure during the evaluation: 1) a 4" bentonite/concrete cap was installed in the open concrete slab adjacent to SSD Pit 6-1; 2) the concrete around the posts closest to SSD Pit 7-3 were sealed with urethane caulk to seal large gaps that were allowing air leakage to the system.

This evaluation consisted of a series of sub-slab air communication tests to measure the pressure differential created by the systems in operation at various points in two sections of Building 6 that had failed the previous evaluation and all of Building 7of each of the two buildings. In the process, we determined the radius of influence for each suction pit. Small diameter test holes were drilled into the slab at strategic measuring point locations and at varying distances from each suction pit. Differential pressure measurements at these points enabled us to characterize, by interpolation or extrapolation, the extent and intensity of the active pressure field. Measurement was by digital manometer. This procedure was repeated until sufficient data was gathered to indicate the perimeter of the detectable influence area (minimum .001 water column inches). Test holes were filled with backer rod and urethane caulk at conclusion of testing.

All measurements are documented in this report and attached pressure field map. Based on inspection of the systems, measurements and smoke testing completed, we have the following comments and conclusions:

- 1. An inspection of risers and suction pits found all locations complete, with no deficiencies noted.
- 2. One of deficiency in the slab was noted near suction pit 6-1. This consisted of an area missing a concrete slab in the 6-1 floor. This was repaired by Laurel Environmental Associates, Ltd. on April 10, 2006.

- 3. The seal between concrete and the post closest to suction pit 7-3 was poor, allowing air to enter the system from the surface. These deficiencies were repaired with urethane caulking by Laurel Environmental Associates, Ltd. on April 12, 2006.
- 4. A quantitative evaluation of the effectiveness sub-slab system to create a measurable negative pressure field that extends throughout the sub-slab(s) of each building found satisfactory negative pressure fields in slabs treated by suction pits 6-1, 6-2, 7-1, 7-2 and 7-3. The slabs serviced by suction pits 6-1 and 6-2, which failed the evaluation in December 2005, now passed the test. Vacuum measured at the pipe leading into suction pit 6-1 was 0.117 inches of water in December 2005 and was 0.206 inches of water on April 12, 2006. This is still low, but apparently still enough vacuum for the system to pass the test.

If you have any questions, please contact me.

Respectfully submitted by, *Laurel Environmental Associates, Ltd.*

Cr Scott A. Yanuck President

Attached:

Table I Photographs Sub-Slab Depressurization Sketches

TABLE I

Evaluation Suction Poi	of Sub-Slab Sy ints 7-1 and 7-3	ystem, Building	g 7
Location	Inches WC	Distance from	n Suction Point 7-3 in feet
	04/12/06		
TP-7-3-1	0.330	15	
TP-7-3-2	0.251	45	
TP-7-3-3	0.027	85	
TP-7-3-4	0.033	100	
TP-7-3-5	0.010	160	
TP-7-3-6	0.033	151	
TP-7-3-7	0.037	152	
TP-7-3-8	0.157	100	
TP-7-3-9	0.120	80	
TP-7-3-10	0.179	48	
TP-7-3-11	0.136	48	
TP-7-3-12	1.104	19	
TP-7-3-13	0.809	45	
TP-7-3-14	0.154	89	
Suction Poi	int 7-2		
Location	Inches WC	Distance from	n Suction Point in feet
	04/12/06		
TP-7-2-1	0.012	13	
TP-7-2-2	1.230	16	
TP-7-2-3	0.081	44	
TP-7-2-4	0.169	56	
TP-7-2-5	0.136	75	
TP-7-2-6	0.033	112	
TP-7-2-7	0.047	64	
TP-7-2-8	0.072	60	
TP-7-2-9	0.427	20	
TP-7-2-10	0.080	24	
TP-7-2-11	0.032	52	
Evaluation	n of Sub-Slab S	System, Buildir	ng 6
Suction P	oint 6-1		
Location	Inches WC		Distance from Suction Point in feet
	12/14/05	04/12/06	
TP-6-1-1	< 0.001	0.005	40
TP-6-1-2	0.005	0.020	16
TP-6-1-3	0.004	0.046	20
TP-6-1-4	0.008	0.031	30
TP-6-1-5		0.136	20
TP-6-1-6		0.013	18

Suction Po	oint 6-2		
Location	Inches WC		Distance from Suction Point in feet
	12/14/05	04/12/06	
TP-6-2-1	< 0.001	0.031	90
TP-6-2-2	0.002	0.054	55
TP-6-2-3	0.003	0.060	40
TP-6-2-4	0.026	0.112	20 (relocated to 25' 04/12/06)
TP-6-2-5	0.025	0.131	20

WC = Water Column

TP = Test Point



Photo 1, unfinished slab in close proximity to Suction Point 6-1



Photo 2, concrete slab adjacent to Suction Pit 6-1sealed by Laurel Environmental 4-12-06