GEODESIGN INC
AN NV5 COMPANY

Memorandum

To:	Kevin Dana	From:	Kyle R. Sattler, L.G. (Washington) Jason O'Donnell, R.G.
Company:	Oregon Department of Environmental Quality, Northwest Region	Date:	April 30, 2020
Address:	700 NE Multnomah Street, Suite 600 Portland, OR 97232		

cc:	Tiffany Sweitzer, Hoyt Street Properties (via email only)

GDI Project:	HoytStProp-4-07-01
RE:	February 2020 Performance Sub-Slab Vapor Monitoring Event Vista Condominiums 1150 NW Quimby Street Portland, Oregon

INTRODUCTION AND BACKGROUND

This memorandum has been prepared on behalf of Hoyt Street Properties for Vista Condominiums, located at 1150 NW Quimby Street in Portland, Oregon (project site). Specifically, this memorandum summarizes the results of the February 2020 performance methane monitoring event. The components of the methane mitigation system and results of previous methane monitoring events (conducted in September 2017 and October 2018) are documented in GeoDesign, Inc.'s Construction Completion Report and Methane Monitoring Plan.[1,2]

Based on the Oregon Department of Environmental Quality's (DEQ's) review of the Construction Completion Report, DEQ prepared a Staff Closure Memo that provided preliminary approval for the No Further Action (NFA) determination for the project site. DEQ noted in email correspondence dated April 3, 2019 that the NFA determination will be conditioned on continued performance monitoring of the active methane mitigation system (for a limited time) and the continued operation of the active methane mitigation system (in perpetuity), although the September 2017 and October 2018 methane monitoring events demonstrated that the methane mitigation system was operating as intended.

The proposed monitoring schedule described in the October 2019 Methane Monitoring Plan noted two additional rounds of methane monitoring would be conducted at the project site, with the final round being conducted in September/October 2020. The Methane Monitoring Plan also noted that GeoDesign would request release of the monitoring requirement from DEQ with continued operation

[1] GeoDesign, Inc., 2019. *Construction Completion Report; Vista Condominiums; 1150 NW Quimby Street; Portland, Oregon; DEQ ECSI No. 6116,* dated February 13, 2019. GeoDesign Project: HoytStProp-4-05-05

[2] GeoDesign, Inc., 2019. *Methane Monitoring Plan; Vista Condominiums; 1150 NW Quimby Street; Portland, Oregon; DEQ ECSI No. 6116,* dated October 22, 2019. GeoDesign Project: HoytStProp-4-07-01

of the active sub-slab ventilation system if the results of the two additional methane monitoring events continued to demonstrate that methane is not accumulating beneath the building at concentrations greater than 1.25 percent. DEQ reviewed the Methane Monitoring Plan and approved it via a letter dated January 27, 2020.

The purpose of this performance monitoring event was to evaluate the effectiveness of the active sub-slab ventilation system and confirm that the results are consistent with the previous performance monitoring events.

FEBRUARY 2020 PERFORMANCE MONITORING ACTIVITIES

On February 5, 2020 GeoDesign monitored each of the six sub-slab monitoring probes using a calibrated Landtec GEM 2000+. Sub-slab probe SSP-4 was full of water upon arrival. The water was purged using a GAST diaphragm pump, and probe SSP-4 was subsequently monitored. The percent by volume (pbv) of methane, oxygen, and carbon dioxide were measured and recorded. In addition, pressure was measured at each of the monitoring probes using a calibrated Landtec GEM 2000+. Once the pressure was recorded, a GAST diaphragm pump was connected to the probe and the GEM 2000+ was connected in line with the pump and the probe via a three-way connector. The pump was then turned on to purge the system at a flow rate of approximately 1.2 cubic feet per minute. Each probe was purged a minimum of seven probe casing volumes. During purging the maximum concentrations of methane, carbon dioxide, oxygen, and balance gases were recorded. Once purging was complete, the stable readings were also recorded. The performance monitoring data are summarized in the tables below.

Performance Monitoring Data – Maximum Values During Purging

Sub-Slab Probe I.D.	Purge Time (minutes)	Methane (pbv)	Carbon Dioxide (pbv)	Oxygen (pbv)	Balance Gases (pbv)
SSP-1	1	0.7	0.2	20.4	78.7
SSP-2	1	0.0	0.2	20.6	79.2
SSP-3	1	0.0	0.1	20.7	79.2
SSP-4	2.3	0.0	0.1	20.6	79.3
SSP-5	1	0.0	0.1	20.6	79.3
SSP-6	1	0.0	0.1	20.6	79.3

I.D.: identification

Performance Monitoring Data – Stable Values After Purging

Sub-Slab Probe I.D.	Purge Time (minutes)	Methane (pbv)	Carbon Dioxide (pbv)	Oxygen (pbv)	Balance Gases (pbv)
SSP-1	1	0.7	0.2	20.4	78.7
SSP-2	1	0.0	0.2	20.6	79.2
SSP-3	1	0.0	0.1	20.7	79.2
SSP-4	2.3	0.0	0.1	20.6	79.3
SSP-5	1	0.0	0.1	20.6	79.3
SSP-6	1	0.0	0.1	20.6	79.3

The February 2020 monitoring data are consistent with the data obtained during the previous methane monitoring event and indicate that methane is not accumulating beneath the building at concentrations greater than 1.25 percent. Based on the methane monitoring data collected to date, it is our professional opinion that the sub-slab methane ventilation system is operating as intended and protective of current and future occupants of the building.

INSPECTION AND MAINTENANCE

On February 5, 2020 GeoDesign conducted initial inspection and maintenance activities associated with the sub-slab ventilation system in accordance with the DEQ-approved Methane Monitoring Plan. The initial inspection and maintenance activities included the following:

- Observed condition and operation of the sub-slab ventilation system, particularly the vent riser assemblies and rain guards
- Observed the accessible lower level floor slab integrity (as practical without destructive methods)
- Observed that invasive activities had not penetrated the lower level floor slab since constructed

The February 5, 2020 site visit revealed the following deficiencies:

- Annular spaces around select slab penetrations had not been sealed to the lower level concrete floor slab
- Annular spaces inside select conduits penetrating the concrete floor slab at the lower level had not been sealed
- Two small holes (less than 1 inch in diameter) were present in the concrete floor slab at a storage unit room in the parking garage
- Rain guards and placards were not applied to the six vent risers where they exit the roof

On February 25, 2020; March 6, 2020; and April 16, 2020 GeoDesign, Cherry City Electric, and Portland General Electric personnel corrected the above deficiencies as follows:

- Sealed annular spaces around concrete floor slab penetrations at the lower level with polyurethane caulking
- Sealed annular spaces inside electrical conduits penetrating the concrete floor slab at the lower level with closed cell polyurethane spray foam
- Filled the two small holes observed in the concrete floor slab with concrete patch
- Applied rain guards and placards to all six of the vent risers where they exit the roof

The Monitoring and Maintenance Inspection Forms (including a photographic log) completed on February 5 and 25, 2020; March 6, 2020; and April 16, 2020 for Vista Condominiums are presented in the Attachment. Corresponding photographs are shown on Figures A-1 through A-6. Based on the results of the inspection and maintenance activities conducted on February 5 and 25, 2020; March 6, 2020; and April 16, 2020, the active sub-slab ventilation system is functioning as designed.

CONCLUSION

Based on the methane monitoring data collected to date, it is our professional opinion that the active sub-slab methane ventilation system is protective of current and future occupants of the building. The methane monitoring data collected to date also indicate that the active sub-slab ventilation system can continue to operate in perpetuity as designed and modifications or improvements are not warranted.

♦ ♦ ♦

We appreciate the opportunity to provide this information to DEQ. Please contact us if you have questions or require further information.

SRV:KRS:JSO:sn
Attachment
One copy submitted (via email only)
Document ID: HoytStProp-4-07-01-043020-envm.docx

Expires 06/01/2020

ATTACHMENT

GEODESIGN INC
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INSPECTION AND MAINTENANCE FORM (Page 1 of 3)
VISTA CONDOMINIUMS

Quarterly _____ Annual ✓ Follow-Up ✓

Date: 2/5/20, 2/25/20, 3/6/20, 4/16/20 Weather: Varies

Inspector(s): SRV Signature: Sara Vaul

Time of Inspection: 1015 - 1315 (2/5), 0915 - 1745 (2/25), 0830 - 1115 (3/6), 0720 - 0900 (4/16)

The following Environmental Engineering Controls were inspected. Areas of concern (if any) have been identified on the attached site map. Photographic documentation of each Environmental Engineering Control is attached. Maintenance and/or repair records (as applicable) for those areas needing maintenance and/or repairs are attached.

Lower Level Floor Slab

Condition of exposed surface: Cracks not observed where accessed. Several small holes in slab observed in storage unit room in parking garage.

Any signs of previous or planned utility work: No

Any signs of ground disturbance, such as excavation or major erosion: No

Condition of floor slab penetration seals: Seals generally absent

Do any observations warrant urgent attention? Place seals at penetrations
Seals placed around penetrations and conduits sealed on 2/25/20, 3/6/20, and 4/16/20. Holes in slab filled on 2/25/20.

Sub-Slab Ventilation System

Is the ventilation system still operating as active? Yes, based on observation of roof vents

Are the vent risers and associated components functioning? Yes

Do any observations warrant urgent attention? Vent risers need placards and rain guards at rooftop. Rain guards and placards attached to roof vents on 2/25/20 and 3/6/20.

Sub-Slab Monitoring Probes

Accessibility of the probes: Generally good access. SSP-3 vault lid was stuck.

Condition of the probes: Probes in good condition. SSP-4 required evacuation of water in probe prior to sampling.

Do any observations warrant urgent attention? No.

Photographic Log: (Please print out all photos as 3X5 or larger and attach to report)

Photo I.D.	Location	Facing Direction	Description
1	5th floor storage area	E	Methane Vent risers
2	Parking garage	W	Slab penetration with seal
3	Parking garage	N	slab penetration with seal
4	IT Closet	N	conduits with seals
5	Fire Riser Room	NW	conduits with seals
6	Storage Room in Parking garage	W	Sealed hole in floor slab
7	Electrical Room	NW	Conduits with seals
8	Electrical Room	S	Conduits with seals
9	5th Story Roof	N	Methane roof vents
10	5th Story Roof	N	Methane roof vents
11	Electrical Room	W	conduits with seals
12	Electrical Room	S	conduits with seals

This report presents opinions formed as a result of our observation of activities relating to engineering controls installed at the project site.

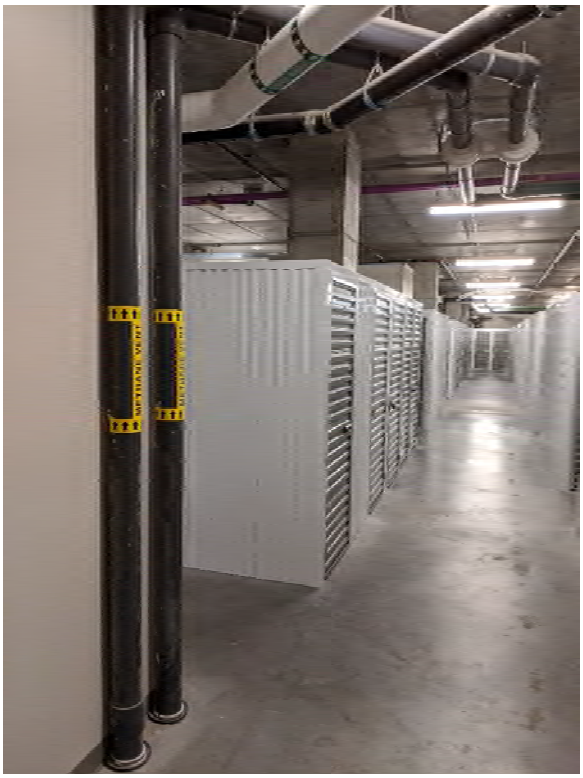
Other Observations, Comments, Concerns, etc.:

2/5/20 Some tenant spaces at the ground level were not accessed due to lack of advance notice to tenants. Electrical panels were not accessed to check for conduit seals because maintenance staff on hand did not have clearance to access them. Several small holes (less than 1 inch diameter) were observed in the storage unit room of the parking garage. See attached site plan indicating areas of the ground floor observed.

2/25/20 Ground level spaces not observed on 2/5/20 accessed. Floor slab penetrations sealed with caulking and conduits penetrating floor slab sealed with spray foam, except where inaccessible due to electrical hazard. Small holes in the storage unit room sealed with concrete patch. Rain guards added to roof vents.

3/6/20 Electrical panels accessed by Cherry City Electric and open conduits were sealed with spray foam. Some panels were not accessed because they were marked as containing PGE electrical equipment and have extreme electrical hazards. Placards added to roof vents.

4/16/20 Remaining electrical panels accessed by PGE and conduits were sealed with spray foam. No remaining outstanding issues identified by GeoDesign.

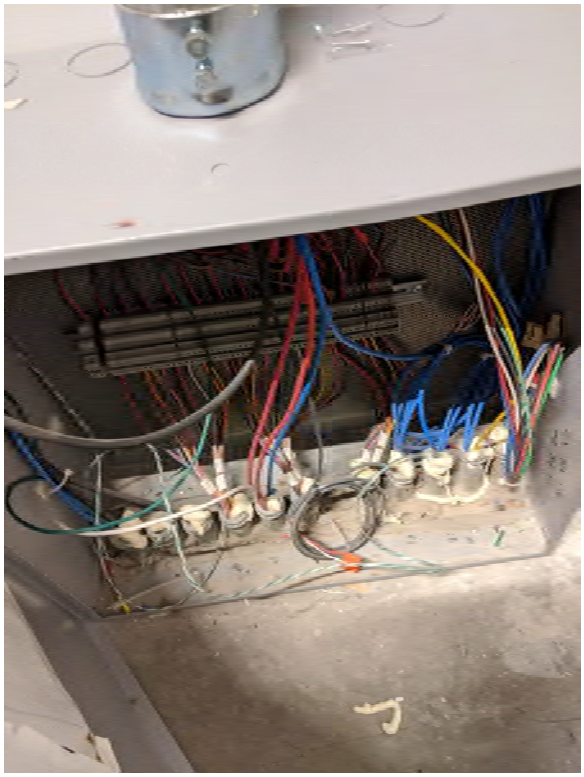


METHANE VENT RISERS WITH PLACARDS AT THE 5TH FLOOR STORAGE UNIT SPACE. PHOTOGRAPH TAKEN FACING EAST.

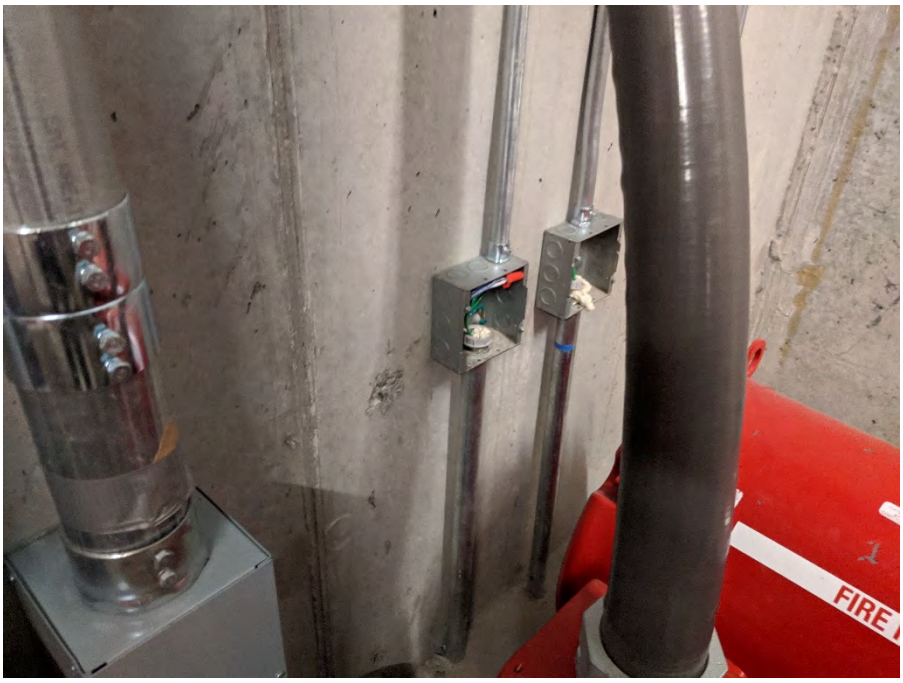
SLAB PENETRATION IN THE PARKING GARAGE SEALED TO THE CONCRETE SLAB WITH CAULKING. PHOTOGRAPH TAKEN FACING WEST.

GEODESIGN INC AN NV5 COMPANY	HOYTSTPROP-4-07-01	**PROJECT SITE PHOTOGRAPHS**	
	APRIL 2020	VISTA CONDOMINIUMS PORTLAND, OR	**FIGURE A-1**

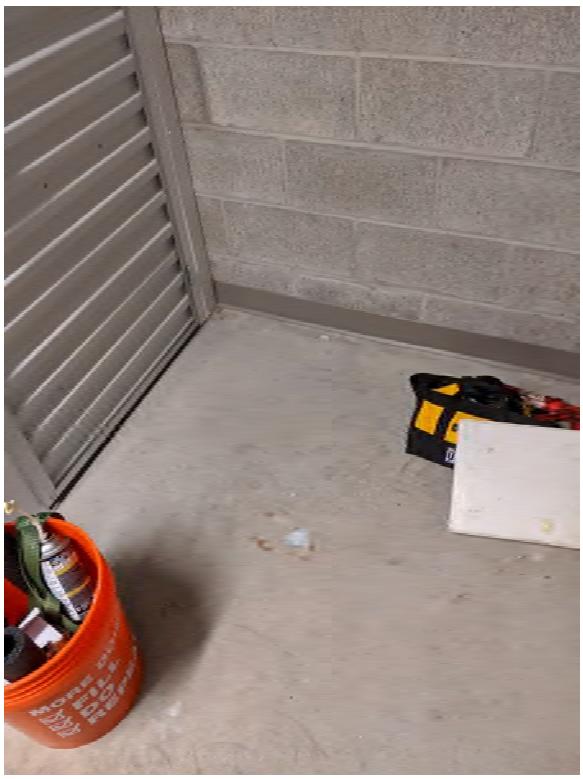
SLAB PENETRATION IN THE PARKING GARAGE SEALED TO THE CONCRETE SLAB WITH CAULKING. PHOTOGRAPH TAKEN FACING NORTH.



CONDUITS SEALED USING CLOSED CELL POLYURETHANE SPRAY FOAM. PHOTOGRAPH TAKEN FACING NORTH.



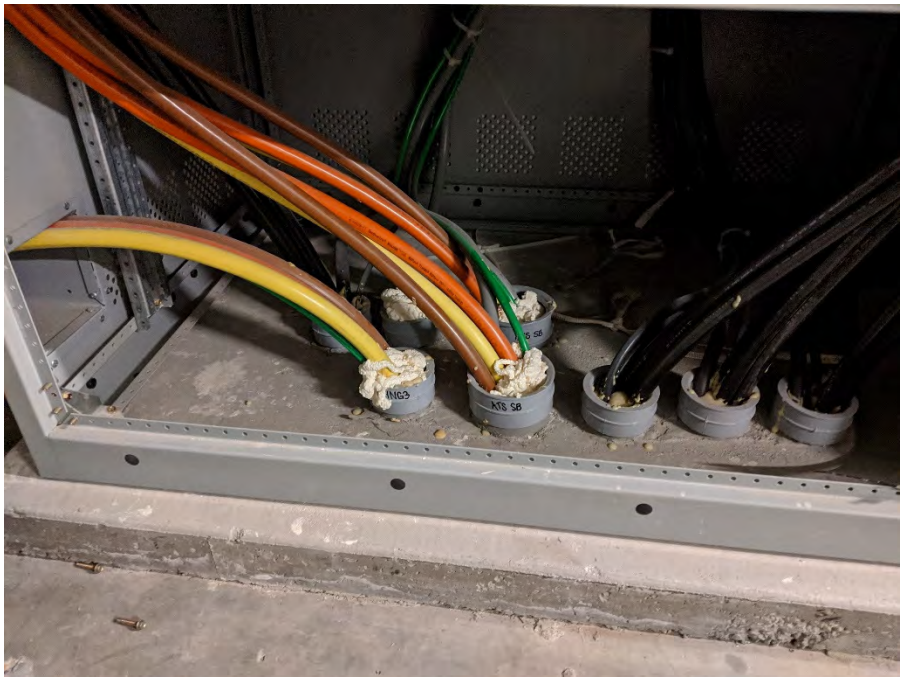
CONDUITS SEALED USING CLOSED CELL POLYURETHANE SPRAY FOAM. PHOTOGRAPH TAKEN FACING NORTHWEST.



SEALED HOLE IN CONCRETE SLAB, LOCATED IN THE STORAGE UNIT ROOM IN THE PARKING GARAGE. PHOTOGRAPH TAKEN FACING WEST.

GEODESIGN INC AN NV5 COMPANY	HOYTSTPROP-4-07-01	**PROJECT SITE PHOTOGRAPHS**	
	APRIL 2020	VISTA CONDOMINIUMS PORTLAND, OR	**FIGURE A-3**

CONDUITS SEALED USING CLOSED CELL POLYURETHANE SPRAY FOAM. PHOTOGRAPH TAKEN FACING NORTHWEST.



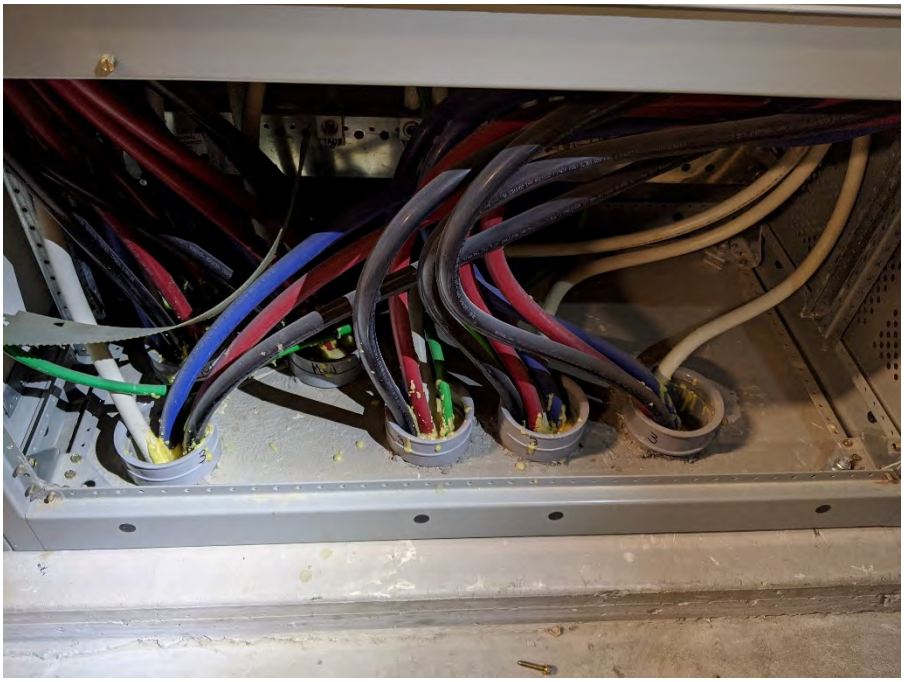
CONDUITS SEALED USING CLOSED CELL POLYURETHANE SPRAY FOAM. PHOTOGRAPH TAKEN FACING SOUTH.

SUB-SLAB VENTILATION SYSTEM ROOF VENTS WITH RAIN GUARDS AND PLACARDS.
PHOTOGRAPH TAKEN FACING NORTH.

SUB-SLAB VENTILATION SYSTEM ROOF VENTS WITH RAIN GUARDS AND PLACARDS.
PHOTOGRAPH TAKEN FACING NORTH.

GEODESIGN INC AN NV5 COMPANY	HOYTSTPROP-4-07-01	**PROJECT SITE PHOTOGRAPHS**	
	APRIL 2020	VISTA CONDOMINIUMS PORTLAND, OR	**FIGURE A-5**

PGE CONDUITS SEALED USING CLOSED CELL POLYURETHANE SPRAY FOAM. PHOTOGRAPH TAKEN FACING WEST.



CONDUITS SEALED USING CLOSED CELL POLYURETHANE SPRAY FOAM. PHOTOGRAPH TAKEN FACING SOUTH.