APPENDIX M

Construction Completion Report - Vapor Intrusion

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Richard E. Dunn, Director

Land Protection Branch
2 Martin Luther King, Jr. Drive
Suite 1054, East Tower
Atlanta, Georgia 30334
404-657-8600

May 12, 2021

Sent via email and USPS

Mr. Tim Hassett
Project Manager
Hercules, LLC
500 Hercules Road
Wilmington, DE 19808-1599

Ms. Molly Matthews
Director of Operations
DRT America, Inc.
2801 Cook Street
Brunswick, Georgia 31520

RE: Construction Completion Report
Hercules/Pinova - Brunswick Facility
Hazardous Waste Facility Permit
No. HW-52(D&S)
EPA ID# GAD004065520

Dear Mr. Hassett and Ms. Matthews:

The Georgia Environmental Protection Division (EPD) has reviewed the Construction Completion Report – Stillhouse Control Room and Chemical Plant Control Room and Laboratory Sub-Slab Depressurization Systems, dated April 13, 2021. No comments were noted. EPD looks forward to receiving the OM&M plan for these two systems. This plan should include, at a minimum, schedule and activities for long term maintenance of these systems as well as the criteria that must be met for the systems to be discontinued.

Should you have any questions or concerns please contact Penny Gaynor at 404-657-8600.

Sincerely,

James Sliwinski

James Sliwinski
Unit Coordinator
Remedial Sites Unit

File: Hercules, Brunswick 216-0060 (G)
S:\RDRIVE\PENNY\Hercules\VI Tier 1 SSD Systems Construction Completion Report.docx

Geosyntec
consultants

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PH 678.202.9500
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April 13, 2021

VIA ELECTRONIC MAIL
Amy Potter, Penny Gaynor, and Jim Sliwinski
Georgia Environmental Protection Division
2 Martin Luther King, Jr. Dr. SE
Suite 1054, East Tower
Atlanta, GA 30334

Subject: **Construction Completion Report – Stillhouse Control Room and Chemical Plant Control Room and Laboratory Sub-slab Depressurization Systems**
Hercules/Pinova Facility, Brunswick, Georgia

Dear Amy, Penny, and Jim:

Enclosed for review by the Georgia Department of Natural Resources, Environmental Protection Division ("EPD") is a document titled *Construction Completion Report – Stillhouse Control Room and Chemical Plant Control Room and Laboratory Sub-slab Depressurization Systems, Hercules/Pinova Facility, Brunswick, GA* that Geosyntec Consultants, Inc. ("Geosyntec") has prepared on behalf of Hercules LLC in connection with vapor intrusion mitigation activities at an industrial facility located at 2801 Cook Street in Brunswick, Georgia (the "Brunswick facility"). The report describes the work that has been completed in accordance with a work plan titled *Vapor Intrusion Mitigation Work Plan, Hercules/Pinova Facility, Brunswick, GA* prepared by Geosyntec on behalf of Hercules and approved by EPD in an email dated September 9, 2020.

Please do not hesitate to contact us if you should have any questions regarding the enclosed report or the next steps that are planned in connection with the evaluation of potential vapor intrusion at buildings located at the Brunswick facility.

Sincerely,

Todd N. Creamer

Todd N. Creamer, Principal

Copies to: Mike Crews, Pinova
Timothy Hassett, Hercules LLC
Greg Roush, Geosyntec

GR6881

Geosyntec consultants

engineers | scientists | innovators

CONSTRUCTION COMPLETION REPORT

STILLHOUSE CONTROL ROOM AND CHEMICAL PLANT CONTROL ROOM AND LABORATORY SUB-SLAB DEPRESSURIZATION SYSTEMS

Hercules/Pinova Facility
Brunswick, Georgia

Prepared for

Hercules LLC.
500 Hercules Road
Wilmington, Deleware 19808

Prepared by

Geosyntec Consultants, Inc.
1255 Roberts Blvd. NW, Suite 200
Kennesaw, Georgia 30144

Project Number GR6881

April 2021

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1. INTRODUCTION

Geosyntec Consultants, Inc. ("Geosyntec") has prepared this Construction Completion Report ("CCR") on behalf of Hercules LLC ("Hercules") for submission to the Georgia Department of Natural Resources, Environmental Protection Division ("EPD") regarding installation of sub-slab depressurization ("SSD") systems at two buildings at an industrial facility located at 2801 Cook Street in Brunswick, Glynn County, Georgia (the "Brunswick facility"). The two buildings are commonly referred to as the Stillhouse Control Room and the Chemical Plant Control Room and Laboratory and are located in the portion of the Brunswick facility that Pinova, Inc. ("Pinova") owns and operates. As described in detail in other submissions to EPD, the Brunswick facility is a large manufacturing facility that has been in operation for more than a century. Hercules is undertaking various environmental activities at the Brunswick facility pursuant to the corrective action program under the Resources Conservation and Recovery Act ("RCRA") as administered by EPD, including assessing the potential for historical releases of volatile organic compounds ("VOCs") to enter buildings that are determined to be potentially susceptible to vapor intrusion.

Based on the results of extensive investigation activities that have been conducted in a phased manner, Hercules elected to undertake preemptive mitigation steps as a precaution to address potential vapor intrusion at the Stillhouse Control Room and the Chemical Plant Control Room and Laboratory. Accordingly, on 20 August 2020, Hercules submitted to EPD for review and approval a document prepared by Geosyntec titled *Vapor Intrusion Mitigation Work Plan, Hercules/Pinova Facility, Brunswick, GA* (the "VI Mitigation Work Plan"). EPD approved the VI Mitigation Work Plan via e-mail and letter dated 9 September 2020. The VI Mitigation Work Plan summarized the diagnostic testing that Geosyntec had conducted at the Stillhouse Control Room and the Chemical Plant Control Room and Laboratory to determine design vacuums and flows, and placement of suction points. The VI Mitigation Work Plan also included conceptual design drawings for each SSD system.

Since EPD approved the VI Mitigation Work Plan, Hercules has worked with Pinova and Geosyntec to procure the necessary components for the SSD systems and to install those systems. Both SSD systems are now fully operational. This CCR describes the work that was performed to construct and install the SSD systems, and to place those systems into operation.

The remainder of this CCR is organized into the following sections:

- Section 2, *Background*, describes work performed at the Brunswick facility that is relevant to this report, and describes the objectives, design, and scope of mitigation activities.
- Section 3, *Mitigation System Installation*, provides details regarding construction and installation of the SSD systems.
- Section 4*, Mitigation System Startup and Testing Activities*, describes the startup testing of the SSD systems and documents that the SSD systems are operating as designed.

- Section 5, *Mitigation System Operation, Monitoring, and Maintenance*, provides an overview of the ongoing operation, monitoring, and maintenance program for the SSD systems.

2. BACKGROUND

This section of the CCR briefly describes the Stillhouse Control Room and Chemical Plant Control Room and Laboratory and summarizes recent relevant environmental assessment activities conducted at and near those two buildings.

2.1 Building Descriptions and History

The Stillhouse Control Room and Chemical Plant Control Room and Laboratory are stand-alone buildings located within the central portion of the Brunswick facility as shown on **Figure 1**. This portion of the Brunswick facility is part of the main operational area at the Brunswick facility. The Stillhouse Control Room (Building No. 13 as shown on **Figure 1**) is a slab-on-grade, concrete-block building with a footprint that is approximately 800 square feet (“ft^2”) in size. The Stillhouse Control Room is located adjacent to the Stillhouse. The building is typically occupied by at least one operator. The building contains a control room and two mudrooms, which separate the control room from the two entrances. There is a large heating, ventilation and air conditioning (“HVAC”) unit with associated ductwork on the outside of the building. This HVAC ductwork extends into the building and above the indoor drop ceiling. The Stillhouse Control Room contains double entry doors at both entrances and is slightly pressurized when the HVAC unit is operating. Pressurization of the Stillhouse Control Room is monitored by a pressure gauge located beneath the thermostat. Typically, the HVAC system pressurizes the Stillhouse Control Room by a pressure that measures approximately 0.2 inches of water compared to the atmospheric pressure outside the building.

The Chemical Plant Control Room and Laboratory (Building No. 17 as shown on **Figure 1**) is a one-story, slab-on-grade building with a footprint that is approximately 1,550 ft^2 in size. The Chemical Plant Control Room and Laboratory contains a control room, a laboratory, a break room, a bathroom, and an HVAC room (which is also used as a storage area). The building walls are constructed of concrete block. The Chemical Plant Control Room and Laboratory does not have double entry doors and is not designed to be pressurized. However, the HVAC system does provide some pressurization when it is operating.

In accordance with EPD technical guidance and a technical guidance document issued by the United States Environmental Protection Agency (“USEPA”) in 2015 titled *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air*, Hercules elected to mitigate the vapor intrusion pathway at the Stillhouse Control Room and Chemical Plant Control Room and Laboratory based on an evaluation of field observations and shallow groundwater sampling results collected in August 2019. The mitigation measures were described in the VI Mitigation Work Plan that EPD approved.

2.2 Sub-Slab Depressurization Diagnostic Testing and Mitigation System Design

Geosyntec performed sub-slab depressurization diagnostic testing on 15 July 2020 and 16 July 2020 to support design elements of the SSD systems at the Stillhouse Control Room and Chemical Plant Control Room and Laboratory, respectively, including the number and spacing of suction points, piping size and fan specifications. The sub-slab diagnostic testing results confirmed that sub-slab depressurization could be used to mitigate the vapor intrusion pathway at each building. Based on the results of the sub-slab diagnostic testing that was performed, Geosyntec determined that one suction point was sufficient to depressurize the foundation slab at the Stillhouse Control Room, and two suction points were required to depressurize the slab at the Chemical Plant Control Room and Laboratory. The results of the diagnostic sub-slab testing that was performed were summarized in the VI Mitigation Work Plan.

Design drawings were finalized following the completion of the sub-slab diagnostic testing process. Geosyntec also contracted with a vendor to pre-fabricate the SSD enclosures and with a subcontractor to install the SSD systems at the Brunswick facility. Construction and installation details for the SSD systems are provided Section 3 of this CCR.

3. MITIGATION SYSTEM INSTALLATION

This section describes activities performed during installation of the SSD systems. As-built drawings of the vapor mitigation piping layouts and construction details for the SSD systems are provided in **Appendix A**. A photographic log documenting construction of the SSD systems is included in **Appendix B**. Copies of the installation and commissioning checklists for each SSD system are provided in **Appendix C**.

3.1 Site Preparation

Prior to installing the SSD systems, Geosyntec discussed the schedule and work areas with the project team and Pinova. Electrical requirements for the SSD systems, and the placement of suction points, piping, and SSD enclosures were also discussed with Pinova to ensure consensus among the parties regarding those design elements prior to construction. Because both the Stillhouse Control Room and Chemical Plant Control Room and Laboratory are located in portions of the Brunswick facility where equipment must meet Class 1 Division 2 specifications established by the National Fire Protection Association ("NFPA") due to the potential for flammable gases and vapors to accumulate, the SSD systems had to be designed and fabricated to meet such specifications.

Geosyntec contracted with Enviro-Equipment of Pineville, NC to fabricate the SSD enclosures and with Moran Environmental Recovery ("Moran") of Jacksonville, FL to install the SSD enclosures, suction points, pipes and associated fittings on-site. Upon completion of the fabrication of the SSD systems by Enviro-Equipment, Geosyntec performed a functional checkout of the systems at Enviro-Equipment's facility in Pineville, NC prior to delivery of the SSD systems to the Brunswick facility. Geosyntec also conducted construction quality assurance ("CQA") to assist Moran with implementing the design for the SSD systems and to document general compliance with the design. Moran obtained the necessary general work and hot work permits from Pinova each day prior to starting work. Geosyntec conducted air space monitoring for flammable gases and VOCs throughout the construction process and acted as a fire watchman during periods of hot work.

3.2 Suction Points

In February 2021, Moran installed one suction point through the foundation footer at the Stillhouse Control Room, and two suction points through the foundation footer at the Chemical Plant Control Room and Laboratory. The suction points at each building were installed by coring a 5-inch diameter hole through the concrete foundation footer from the building exterior. Moran conducted concrete coring with water to suppress sparks and dust during coring activities.

At the sub-slab suction points, Moran removed approximately one cubic foot of sub-slab soils and placed concrete cuttings and sub-slab soils into labelled drums for staging and disposal. Moran then installed a 3-inch diameter schedule 40 polyvinyl chloride ("PVC") pipe through the footer to extend 2-3 inches into the suction pit. The 3-inch PVC pipe was secured with a Link-Seal® fitting to seal the suction point from the outside and center the 3-inch pipe within the cored hole. The remaining annular space between the cored hole and PVC pipe was filled with hydraulic cement to the exterior of the footer. Diagrams of the suction point installation and piping are shown on Drawings 4 and 5 of **Appendix A**.

At the location where the riser pipe from each suction point comes aboveground adjacent to the building foundation, Moran installed a gate valve and a 1/4-inch diameter barb fitting upstream of the gate valve. Moran then connected a length of 1/4-inch inner diameter low-density polyethylene ("LDPE") tubing to the hose barb fitting. The 1/4-inch LDPE tubing was connected to a dedicated Magnehelic® gauge within the respective SSD enclosure for each building to obtain vacuum measurements at each suction point. Additionally, Moran drilled and installed a 3/8-inch diameter ball valve at a 90-degree orientation to the barb fitting to serve as a monitoring port in each riser pipe for purposes of collecting velocity measurements, collecting analytical samples, or deploying tubing to remove water from the respective suction points.

3.3 Vapor Conveyance Piping and Vacuum Monitoring Tubing

Following installation of the suction points at the Stillhouse Control Room and Chemical Plant Control Room and Laboratory, Moran connected the suction point pipes to dedicated 3-inch diameter schedule 40 PVC conveyance pipes. At the Stillhouse Control Room, piping from the single suction point was brought above ground and transitioned to a horizontal conveyance pipe two feet above the ground surface. The 3-inch diameter schedule 40 PVC conveyance pipe then was connected to a 1-inch diameter galvanized steel pipe, through a reducing coupling, immediately before entering the SSD enclosure. At the Chemical Plant Control Room and Laboratory, 3-inch schedule 40 PVC conveyance piping from the northern suction point (SP-1) was installed within a trench and brought vertically aboveground adjacent to the southern suction point (SP-2). Piping from suction point SP-1 extends approximately 30 inches and piping from suction point SP-2 extends approximately 18 inches above the ground surface before they both make 90-degree turns and run horizontally along the Chemical Plant Control Room and Laboratory and the SSD enclosure walls. The 3-inch PVC conveyance pipes join at a 3-inch PVC junction fitting immediately before connecting to a 1-inch diameter galvanized steel pipe entering the SSD enclosure.

Moran connected PVC conveyance piping and valves by cleaning the pipe and union surfaces with PVC primer, applying PVC cement, and then attaching the sections together. Sweep fittings were used at elbows to minimize frictional losses. A 3-inch PVC tee was installed atop the exhaust piping at each SSD enclosure to prevent rainwater from entering the exhaust piping. Mesh varmint guards were affixed to the open ends of the exhaust tees to prevent animals or insects from entering the SSD systems. Moran secured conveyance piping to the exterior walls of the respective buildings and SSD enclosures with pipe hangers and labeled the piping with the words "Vapor Mitigation Pipe – Do Not Block or Damage." Aboveground outdoor conveyance piping was painted with ultraviolet-resistant latex paint to protect the piping from sun damage. Piping was first painted with a white primer. Influent vapor conveyance pipes were then painted yellow and effluent exhaust pipes were painted with a clear outer coat.

Conveyance piping was generally installed with a slight slope such that condensate that may form will drain towards a nearby suction point rather than accumulate in the piping. As described in Section 4.2, below, a concrete pad was poured over each suction point to reduce potential infiltration from rainfall.

The 1/4-inch inner diameter LDPE tubing that was connected to a 1/4-inch brass compression fitting tapped into each suction point riser pipe below the gate valve as described in Section 3.2, above, was installed to follow along the respective vapor recovery piping towards the SSD enclosure that services the suction point. Penetrations into each SSD enclosure for the LDPE tubing were sealed using a weather-resistant silicone caulk. The LDPE tubing was secured to the vapor recovery piping and pipe hangers using snap ties. The layout of the vapor conveyance piping, LDPE tubing, and associated appurtenances are shown on Drawings 3 and 4 of **Appendix A**.

3.4 SSD Enclosures and Equipment

Moran installed 4-inch thick concrete pads with wire mesh reinforcement to support the SSD enclosures. The concrete pads are approximately 8 feet wide by 6 feet long so that a concrete skirt approximately 2 feet wide is present around all sides of the SSD enclosures (which have footprints that measure 4 feet by 4 feet), except where the enclosures back against the exterior of each building. The SSD enclosures were secured to their respective concrete pads using concrete anchors and ½-inch stainless steel bolts installed through steel mounting tabs on each corner of the enclosures.

Within each SSD enclosure, extracted vapors are routed through a Solberg STS-100C moisture separator before passing through a vapor-phase activated carbon ("VGAC") drum. One-half inch ball valves with ¼-inch hose barbs were installed at the inlet and outlet of each VGAC drum to act as sample collection and monitoring ports. Connections to the inlet and outlet of each VGAC drum were made using cam-lock fittings and 1-inch flexible tanker truck hose to allow for easy replacement of VGAC drums. A plastic removable ramp was also placed in each SSD enclosure to aid in the removal and insertion of VGAC drums. Downstream of each VGAC drum, Enviro-Equipment installed a Solberg ST-896-100C particulate filter and 1-inch galvanized tee with a 1-inch brass dilution valve and filter silencer immediately prior to the blower. The dilution valve will bring in make-up air to the blower so that if flow is restricted from the suction points (i.e. due to flooding or suction pit collapse), the blower should not be at risk of overheating and failing.

The blower that was installed in each SSD enclosure is a ROTRON model EN101AG58L with a 0.5-horsepower explosion-proof motor capable of producing a maximum airflow of 27 standard cubic feet per minute and a maximum pressure rating of 23 inches of water. A 1-inch exhaust silencer was installed downstream of each blower prior to the exhaust pipe exiting the enclosure through a 1-inch male National Pipe Thread fitting through the roof of the enclosure. Magnehelic® gauges were mounted to the wall of each SSD enclosure to read vacuum levels at each suction point. The SSD enclosure at the Chemical Plant Control Room and Laboratory has two gauges, while the SSD enclosure for the Stillhouse Control Room has one gauge. As-built photographs of the interior of each SSD enclosure are shown on Drawing 5 of **Appendix A** and a process and instrumentation diagram for each SSD enclosure is shown on Drawing 7 of **Appendix A**. All electrical connections within the SSD enclosures conform to NFPA Class 1 Division 2 electrical requirements.

3.5 Electrical Installation and Alarm System

Owens and Pridgen Inc. (“OPI”), a licensed electrician and subcontractor to Moran, wired the electrical components of the SSD systems to dedicated circuits within breaker panels present in the Stillhouse Control Room and Chemical Plant Control Room and Laboratory, respectively. Both SSD enclosures are powered by 120 volt, alternating current, single phase power connected from the facility power supply to a dedicated, 20-amp breaker. The SSD enclosures were delivered pre-wired by Enviro-Equipment to meet NFPA Class 1 Division 2 electrical specifications. Electrical components are contained within a National Electrical Manufacturers Association (“NEMA”) type 7 enclosure, suitable for use in Class 1 NFPA environments, mounted to the side of each enclosure. Adjacent to each electrical panel is an explosion-proof on/off switch for each enclosure.

Enviro-Equipment connected an explosion-proof, red alarm light to the NEMA7 electrical panel. The red alarm light is located on the outside of each SSD enclosure so that the light extends above the roof of the enclosure. The red alarm light is triggered by a loss of vacuum at the extracted vapor inlet to the SSD enclosure. The SSD system will continue to operate if the low-vacuum alarm is tripped. During commissioning, the alarm was tested by removing the vacuum switch monitoring tube during operation to induce a low vacuum condition. A placard has been placed on the exterior of each SSD enclosure with contact information for Geosyntec. Pinova personnel have been instructed to relay observed alarms to Hercules and/or Geosyntec for investigation. The electrical diagram for the SSD systems is provided on Drawing 5 of **Appendix A**.

4. MITIGATION SYSTEM STARTUP AND TESTING

Geosyntec started operation of the SSD systems at the Stillhouse Control Room and Chemical Plant Control Room and Laboratory on 11 March 2021 following an initial startup attempt on 2 and 3 March 2021. The following sections summarize testing of the SSD systems following startup of operation of the systems.

4.1 Leak Testing

Geosyntec conducted smoke testing as part of startup of the SSD systems to confirm that the suction point penetrations through the concrete footers and the connections for the PVC pipes and fittings were properly sealed. Geosyntec conducted leak checks by using an electric smoke pen around pipe connections and excavated suction point penetrations with each SSD system operating. Geosyntec did not observe any leaks around the suction point penetrations. In addition, no gaps or cracks were observed within the building slab itself. Smoke testing was also performed within each control room during diagnostic testing of the SSD systems and no preferential pathways (e.g., gaps or cracks within the slab) were identified.

4.2 Vacuum Response Testing

Geosyntec conducted vacuum response testing as part of startup of the SSD systems in March 2021 to evaluate the radius of influence of the suction points and verify adequate depressurization across each building slab. The vacuum response testing consisted of installing three communication test points ("CTPs") through the concrete floor slab at both the Stillhouse Control Room and Chemical Plant Control Room and Laboratory, as shown on Drawing 3 of **Appendix A**. Geosyntec located the CTPs to observe the vacuum propagation across the footprints of the Stillhouse Control Room and Chemical Plant Control Room and Laboratory. Geosyntec installed the CTPs flush to the building slab by drilling a 1 1/2-inch hole approximately halfway through the slab, then penetrating the remainder of the slab with a 3/8-inch hammer drill bit. CTPs were installed using stainless-steel VaporPins® which are capped with silicone dust caps when not in use and covered with stainless steel flush-mount caps. Geosyntec tested CTPs using a digital micromanometer with a resolution of 1 Pascal ("Pa").

Startup and commissioning of both SSD systems was first attempted on 2 and 3 March 2021. However, suction points at both the Stillhouse Control Room and Chemical Plant Control Room and Laboratory were flooded due to recent rainfall events. Rainfall measurements are not collected at the Brunswick facility, but the weather station at St. Simons Airport approximately 6 miles east of the Brunswick facility reported 0.28 inches of rainfall on 2 March and 1.57 inches on 3 March. Field staff also reported pooled rainwater on each suction point prior to conducting tests. The SSD systems passed the inspection and commissioning items but failed the communication tests due to the flooding that was present. On 9 and 10 March 2021, Moran returned to the Brunswick facility and installed 4-inch thick reinforced concrete pads over each of the suction points to reduce potential infiltration from future rain events to prevent flooding of the suction points. Following installation of the additional concrete pads, startup of both SSD systems was reattempted on 11 March 2021 during a period of dry weather and was successful.

The results from the vacuum response test conducted on 11 March 2021 as part of the startup and commissioning of the SSD system at the Stillhouse Control Room indicated that the SSD system produced a vacuum field greater than the 1 Pa minimum design specification below the slab for the Stillhouse Control Room. The lowest vacuum reading was measured at CTP-3 near the southeast corner of the building at 6 Pa above baseline (the baseline differential pressure was -2 Pa and reading with the SSD system on was -8 Pa). The applied vacuum level measured at the suction point (SP-1) was 2.0 inches of water.

The results of the vacuum response test conducted on 11 March 2021 as part of the startup and commissioning of the SSD system at the Chemical Plant Control Room and Laboratory indicated that the SSD system produced a vacuum field greater than the 1 Pa minimum design specification below the slab for the Chemical Plant Control Room and Laboratory. The lowest vacuum reading was measured at CTP-1 located in the northwest corner of the building at 4 Pa above baseline (the baseline differential pressure was -1 Pa and reading with the SSD system on was -5 Pa). The applied vacuum level measured at suction point SP-1 was 3.2 inches of water and the applied vacuum level measured at suction point SP-2 was 1.8 inches of water.

5. MITIGATION SYSTEM OPERATION, MONITORING, AND MAINTENANCE

The SSD systems are designed to operate with minimal maintenance. The SSD systems are currently in an initial three-month startup/shakedown period. During this period, Geosyntec is observing operation of the SSD systems and gathering information that will be considered in preparing the Operation, Monitoring, and Maintenance ("OM&M") plan following the first three months of continuous operation of the SSD systems. Current OM&M activities involve:

- Addressing alarm conditions;
- Periodic visual inspections of the components of the SSD systems;
- Periodic field measurements from CTPs within each building; and
- Periodic field measurements including vacuum at the suction points and fans.

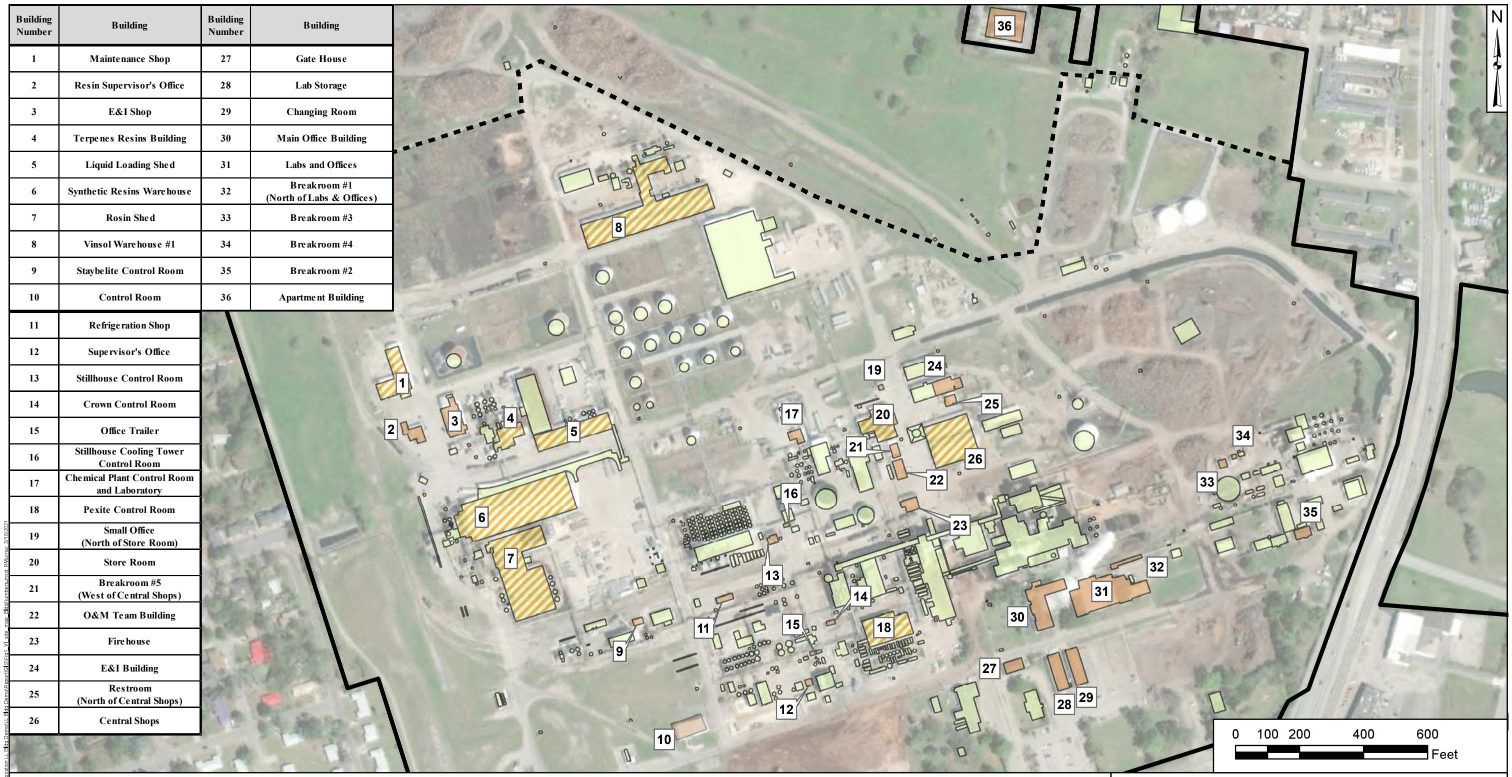
Following startup of the SSD systems on 11 March 2021, the scheduled activities during the initial three-month OM&M period are as follows: weekly inspections will be conducted for the first month, then monthly inspections will be conducted for the remaining two months, Additional off-schedule visits to attend to alarm conditions will be conducted on an as-needed basis. Vapor samples from the influent to and effluent from the VGAC drums are anticipated to be collected at the end of the first and second months of operation. The samples will be analyzed for VOCs via USEPA Method TO-15 low-level. The purpose of collecting the samples is to develop a correlation between measurements collected during routine OM&M activities using a photoionization detector and approximate concentrations of individual constituents of potential concern for the vapor intrusion pathway. Analytical results from the vapor samples will be presented in the forthcoming OM&M plan.

Pinova personnel have been notified to contact Hercules and/or Geosyntec in the event of alarm conditions so that a technician can investigate the cause of the decreased vacuum. The particular SSD system will have to be reset to clear the alarm condition.

6. REFERNCES

Geosyntec. 2020. Vapor Intrusion Mitigation Work Plan.

FIGURE



Building Number	Building	Building Number	Building
1	Maintenance Shop	27	Gate House
2	Resin Supervisor's Office	28	Lab Storage
3	E&I Shop	29	Changing Room
4	Terpenes Resins Building	30	Main Office Building
5	Liquid Loading Shed	31	Labs and Offices
6	Synthetic Resins Warehouse	32	Breakroom #1 (North of Labs & Offices)
7	Rosin Shed	33	Breakroom #3
8	Vinsol Warehouse #1	34	Breakroom #4
9	Staybelite Control Room	35	Breakroom #2
10	Control Room	36	Apartment Building
11	Refrigeration Shop		
12	Supervisor's Office		
13	Stillhouse Control Room		
14	Crown Control Room		
15	Office Trailer		
16	Stillhouse Cooling Tower Control Room		
17	Chemical Plant Control Room and Laboratory		
18	Pexite Control Room		
19	Small Office (North of Store Room)		
20	Store Room		
21	Breakroom #5 (West of Central Shops)		
22	O&M Team Building		
23	Firehouse		
24	E&I Building		
25	Restroom (North of Central Shops)		
26	Central Shops		

- 🟩 Structure
- ▨ Building Containing Smaller Enclosed and Occupiable Space Susceptible to VI
- 🟧 Building Determined Susceptible to VI
- ▭ Site Boundary (dashed where separating Hercules and Pinova properties)

Buildings in Vapor Intrusion Investigation

Hercules/Pinova Facility, Brunswick, Georgia

Geosyntec consultants

Kennesaw

March 2021

Figure

1

APPENDIX A

SSD As-Built Drawings

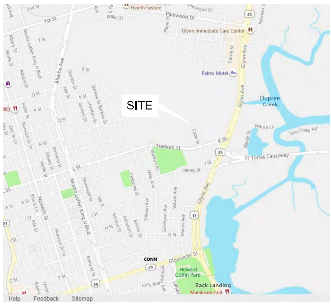
SUB-SLAB DEPRESSURIZATION SYSTEMS AT STILLHOUSE CONTROL ROOM AND CHEMICAL PLANT CONTROL ROOM

AS-BUILT DRAWINGS

HERCULES / PINOVA FACILITY

2801 COOK STREET, BRUNSWICK, GEORGIA

MARCH 2021



SOURCE: @ 2020, BING

VICINITY MAP
NOT TO SCALE

List of Drawings

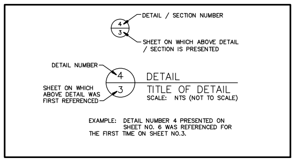
Sheet Number	Drawing Title	REV
1	COVER SHEET	
2	GENERAL NOTES	
3	SYSTEM LAYOUT PLANS	
4	SYSTEM DETAILS I	
5	SYSTEM DETAILS II	
6	SYSTEM DETAILS III	
7	SYSTEM DETAILS IV	

SOURCE: @ 2020, BING

LOCATION MAP
NOT TO SCALE

PREPARED FOR:

Hercules LLC
500 Hercules Road
Wilmington, DE 19808



EXAMPLE: DETAIL NUMBER 4 PRESENTED ON SHEET NO. 6 WAS REFERENCED FOR THE FIRST TIME ON SHEET NO.3.

DETAIL IDENTIFICATION LEGEND

AS-BUILT DRAWINGS

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
1255 ROBERTS BOULEVARD, SUITE 200
KENNESAW, GEORGIA, 30144
PHONE: 978.202.9580

TITLE: COVER SHEET

PROJECT: SUB-SLAB DEPRESSURIZATION SYSTEMS AT STILLHOUSE CONTROL ROOM AND CHEMICAL PLANT CONTROL ROOM

SITE: HERCULES / PINOVA FACILITY
2801 COOK STREET, BRUNSWICK, GEORGIA

DESIGN BY:	JK	DATE:	MARCH 2021
DRAWN BY:	RMK	PROJECT NO.:	GR6881
CHECKED BY:	JK	FILE:	
REVIEWED BY:	TC, AR	DRAWING NO.:	
APPROVED BY:	TC	1 OF 7	

(1in) (2in) (3in) (4in)
SCALE IS BASED ON 22" X 34" NON-REDUCED SHEET SIZE (BORDER = 21" X 32")

T:\Projects_CADD\B\BRUNSWICK GA - SSD\DRAWINGS\GR6881 AB D001 (COVER).dwg Last Edited By:RKOHLSTROM

A. GENERAL

1. THE VAPOR MITIGATION SYSTEM DESIGN AND THESE DRAWINGS WERE PREPARED ACCORDING TO THE STANDARD LEVEL OF CARE NORMALLY EXERCISED BY MEMBERS OF THE ENVIRONMENTAL CONSULTING PROFESSION PRACTICING IN THE UNITED STATES AT THIS TIME. THEY ASSUME THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR WHO HAS A WORKING KNOWLEDGE OF APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE.
2. ALL WORK WAS PERFORMED IN COMPLIANCE WITH FEDERAL, STATE, AND LOCAL BUILDING, FIRE, AND ELECTRICAL CODES.

B. INTENT AND BASIS – VAPOR MITIGATION SYSTEM

1. GEOSYNTEC DESIGNED TWO ACTIVE VAPOR MITIGATION SYSTEMS TO ACHIEVE A DIFFERENTIAL PRESSURE BETWEEN SUB-SLAB SOIL GAS AND INDOOR AIR OF AT LEAST 1 PASCAL (PA) (0.004 IN. H2O) ACROSS THE SLAB OF BOTH BUILDINGS.
2. THE INTENT OF THE VAPOR MITIGATION SYSTEMS IS TO CREATE NEGATIVE AIR PRESSURE BELOW THE BUILDING FLOOR SLABS UNDER TYPICAL METEOROLOGICAL AND HEATING AND VENTILATION CONDITIONS BY WITHDRAWING AIR FROM SUCTION PITS (CONNECTED TO SUCTION POINT PIPING) BELOW THE SLAB AS DEMONSTRATED BY MEASUREMENTS MADE BY ENGINEER IN REPRESENTATIVE AREAS OF THE SLAB.
3. EXTRACTED AIR IS EXHAUSTED ABOVE THE ROOF OF THE BUILDING AT A LOCATION AND IN A MANNER THAT PREVENTS THE AIR FROM ENTERING THE BUILDING.
4. THE ELECTRICAL COMPONENTS OF THE VAPOR MITIGATION SYSTEMS – INCLUDING LIGHTS, ALARMS, SWITCHES, AND ELECTRICAL PANELS MEET CLASS 1 DIVISION 2 CLASSIFICATIONS.

C. SUCTION POINT

1. SUB-SLAB SUCTION POINTS ARE CONSTRUCTED BY EXCAVATING/TRENCHING A HOLE FROM THE EXTERIOR OF THE BUILDING TO BELOW THE SLAB OF THE BUILDING AND REMOVING APPROXIMATELY 1 CUBIC FOOT OF SOIL FROM BENEATH THE SLAB. THE SUCTION POINT HOLE IS CORED HORIZONTALLY THOUGH THE SLAB/FOOTING, AND A SUCTION PIT EXCAVATED. THREE-INCH DIAMETER SCHEDULE 40 PVC PIPE IS INSTALLED HORIZONTALLY BENEATH THE SLAB AND THEN TURNED UP TO THE GROUND SURFACE OUTSIDE THE BUILDING.
2. PIPING IS SEALED INTO THE SLAB USING MODULAR COMPRESSION SEALS (E.G. LINKSEAL®).

D. CONVEYANCE PIPE

1. THE CONVEYANCE PIPES ARE INSTALLED IN COMPLIANCE WITH ALL APPLICABLE BUILDING AND FIRE CODES.
   a. VERTICAL PIPE RUNS ARE SUPPORTED AT LEAST EVERY 10 FEET.
   b. HORIZONTAL RUNS ARE SUPPORTED AT LEAST EVERY 6 FEET WITH CODE APPROVED HANGERS. HORIZONTAL RUNS ARE SUPPORTED WITHIN TWO FEET OF EACH FITTING.

2. HORIZONTAL PIPE RUNS ARE SLOPED A MINIMUM OF 1/8" PER FOOT OF RUN TO ENSURE THAT CONDENSATION OR MOISTURE IN THE PIPE WILL DRAIN TOWARD THE SUCTION POINT.
3. CONVEYANCE AND EXHAUST PIPES INSTALLED ABOVE GROUNDARE PAINTED WITH A UTRAVIOLET-RESISTANT ACRYLIC OR LATEX PAINT COMPATABLE WITH PVC.
4. EACH HORIZONTAL RUN OF OF CONVEYANCE PIPE IS MARKED OR LABELED "**VAPOR MITIGATION PIPE - DO NOT BLOCK OR DAMAGE**" WITH A DURABLE, WEATHER RESISTANT MATERIAL IN 2 INCH DECAL TO ENSURE PROPER IDENTIFICATION OF THE PIPES.
5. THE EXHAUST POINT OF THE RISER PIPE ABOVE THE ROOF IS AT LEAST:
   a. 10 FEET HORIZONTALLY FROM ANY HVAC AIR INTAKES OR OTHER OPENINGS INTO THE BUILDING,
   b. 2 FEET ABOVE THE BUILDING ROOF AND IMMEDIATELY ADJACENT ROOF,
   c. 12 INCHES ABOVE ADJACENT PARAPET WALLS, AND
   d. TWO FEET ABOVE HVAC AIR INTAKES WITHIN 25 FEET OF THE EXHAUST POINT.
6. A SCREENED CAP (E.G. VARMINT GUARD) IS INSTALLED ON THE TOP OF THE FAN EXHAUST PIPE.

F. TREATMENT SYSTEM ENCLOSURE

1. A PREFABRICATED, STEEL-SIDED ENCLOSURE IS UTILIZED TO HOUSE THE VGAC DRUM, ELECTRIC FAN, ELECTRICAL CONNECTIONS, INSTRUMENTATION AND ALARMS FOR EACH SYSTEM.
2. THE ENCLOSURE CONTAINS A DOOR FOR ACCESS, AND REMOVABLE RAMPS TO ALLOW FOR VGAC DRUMS TO BE REMOVED USING A DRUM DOLLEY.
3. THE ENCLOSURE CONTAINS VENTILATION EXHAUST LOUVERS SO VAPORS WILL NOT ACCUMULATE WITHIN THE ENCLOSURE.

G. VGAC TREATMENT

1. EACH SYSTEM UTILIZES A 55-GALLON VGAC DRUM FOR TREATMENT OF EXTRACTED VAPORS PRIOR TO THE EXHAUST TO ATMOSPHERE.
2. EACH SYSTEM HAS MONITORING PORTS IMMEDIATELY BEFORE AND AFTER THE VGAC DRUM TO MONITOR PRESSURE AND COLLECT ANALYTICAL SAMPLES AS NEEDED.
3. AN AIR/MOISTURE SEPARATOR IS INSTALLED TO REMOVE MOISTURE FROM THE VAPOR STREAM PRIOR TO ENTERING THE VGAC DRUM.

H. ELECTRIC FAN

1. A ROTRON EN101 BLOWER DESIGNED FOR USE WITH VOCS AND CLASS 1 DIVISION 2 COMPLIANTIS ATTACHED TDOWNSTREAM OF THE CARBON VESSEL. THE BLOWER IS MOUNTED AS PER THE MANUFACTURERS INSTRUCTIONS.
2. BLOWER (AND PIPING) IS MOUNTED IN A WAY THAT MINIMIZES SOUND AND THE TRANSFER OF VIBRATIONS TO THE BUILDING, AS RECOMMENDED BY THE BLOWER MANUFACTURER. PIPING SHALL NOT COME IN DIRECT CONTACT WITH THE BLOWER HOUSING.

I. MONITORS AND ALARM

1. A MAGNEHELIC GAUGES (DWYER MODELS 2004 WITH MOUNTING BRACKET, 0-INCH UP TO 4-INCHES OF WATER) ARE INSTALLED ON THE WALL WITHIN THE TREATMENT SYSTEM ENCLOSURE. MAGNEHELIC GAUGES ARE CONNECTED TO THE SUCTION POINT USING LOW-DENSITY POLYETHYLENE (LDPE) TUBING.
   a. TUBING CONNECTING THE SUCTION POINT TO A MAGNEHELIC GAUGEIS SECURED TO ITS RESPECTIVE SUCTION POINT CONVEYANCE PIPING USING CABLE TIES SPACED APPROXIMATELY EVERY 6-FEET.
   b. TUBING PENETRATIONS WHERE IT ENTERS THE TREATMENT SYSTEM ENCLOSURE ARE SEALED WITH WEATHERPROOF CAUKING.
2. THE MAGNEHELIC GAUGES ARE INSTALLED AT LOCATIONS THAT ARE READILY VISIBLE WITHIN THE ENCLOSURE.
3. 120 VOLT ELECTRIC SERVICE IS PROVIDED WITHIN A NEMA7 ELECTRICAL JUNCTION BOX WITHIN THE TREATMENT SYSTEM ENCLOSURE. THE ENCLOSURE IS WIRED TO A DEDICATED 20 AMP CIRCUIT BREAKER WITH THE RESPECTIVE CONTROL ROOM.
4. A LOW VACUUM SWITCH IS CONNECTED TO A RED LIGHT ON THE EXTERIOR OF THE ENCLOSURE WHICH ILLUMINATES WHEN A LOSS OF VACUUM OCCURS AT THE INFLUENT TO THE VGAC DRUM.

AS-BUILT DRAWINGS

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec
consultants
1255 ROBERTS BOULEVARD, SUITE 200
KENNESAW, GEORGIA, 30144
PHONE: 978.202.9580

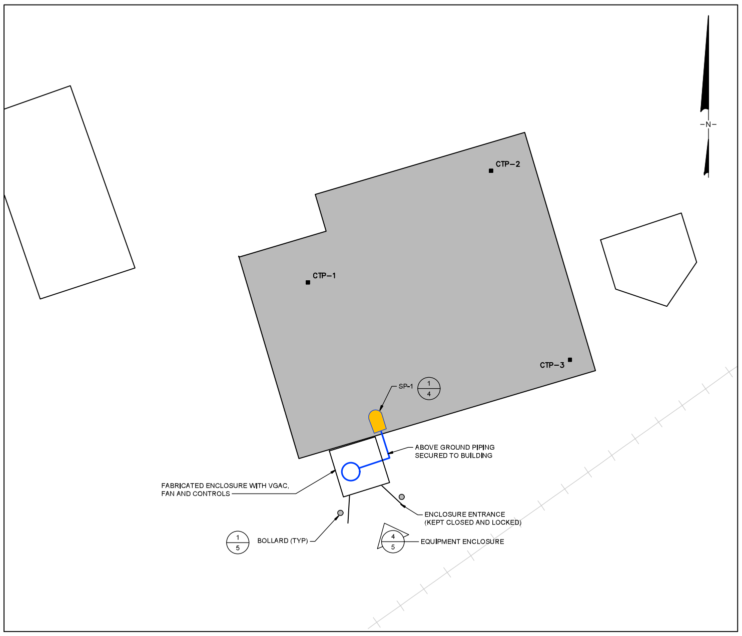
TITLE: GENERAL NOTES

PROJECT: SUB-SLAB DEPRESSURIZATION SYSTEMS AT STILLHOUSE CONTROL ROOM AND CHEMICAL PLANT CONTROL ROOM

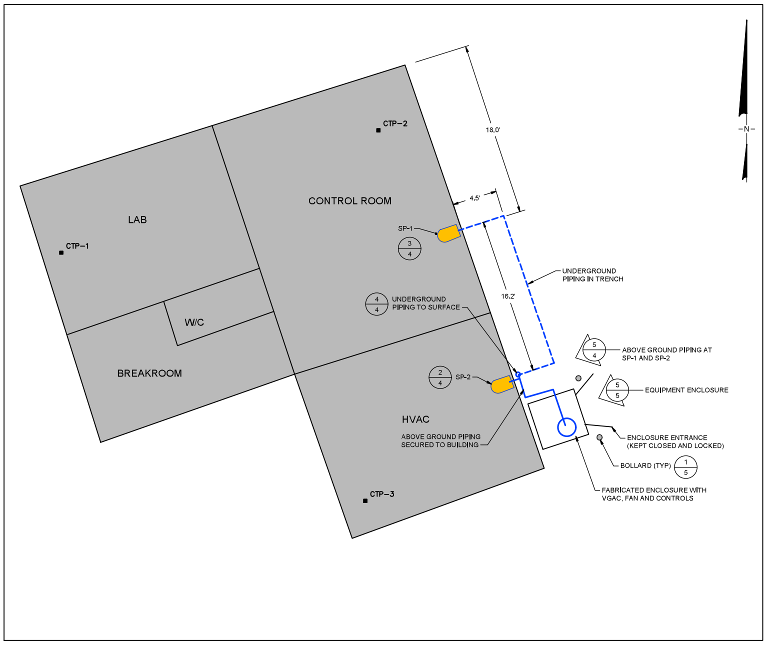
SITE: HERCULES / PINOVA FACILITY
2801 COOK STREET, BRUNSWICK, GEORGIA

DESIGN BY: JK
DRAWN BY: RMK
CHECKED BY: JK
REVIEWED BY: TC, AR
APPROVED BY: TC
DATE: MARCH 2021
PROJECT NO.: GR6881
FILE:
DRAWING NO.: 2 OF 7

(1in) (2in) (3in) (4in)
SCALE IS BASED ON 22" X 34" NON-REDUCED SHEET SIZE (BORDER = 21" X 32")



STILLHOUSE CONTROL ROOM SUB-SLAB DEPRESSURIZATION SYSTEM LAYOUT



CHEMICAL PLANT CONTROL ROOM AND LABORATORY SUB-SLAB DEPRESSURIZATION SYSTEM LAYOUT

LEGEND

CTP-1 ■	COMMUNICATION TEST POINT (CTP) LOCATION
5/4	PHOTO DETAIL WITH CAMERA DIRECTION

NOTES:

1. BASE PLAN WAS PROVIDED BY CLIENT AND IS APPROXIMATE

AS-BUILT DRAWINGS

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
1255 ROBERTS BOULEVARD, SUITE 200
KENNESAW, GEORGIA, 30144
PHONE: 978.202.9580

TITLE:
SYSTEM LAYOUT PLANS

PROJECT:
SUB-SLAB DEPRESSURIZATION SYSTEMS AT STILLHOUSE CONTROL ROOM AND CHEMICAL PLANT CONTROL ROOM

SITE:
HERCULES / PINOVA FACILITY
2801 COOK STREET, BRUNSWICK, GEORGIA

DESIGN BY:	JK	DATE:	MARCH 2021
DRAWN BY:	RMK	PROJECT NO.:	GR6881
CHECKED BY:	JK	FILE:	
REVIEWED BY:	TC, AR	DRAWING NO.:	
APPROVED BY:	TC	3 OF 7	

(1in) (2in) (3in) (4in)
SCALE IS BASED ON 22" X 34" NON-REDUCED SHEET SIZE (BORDER = 21" X 32")

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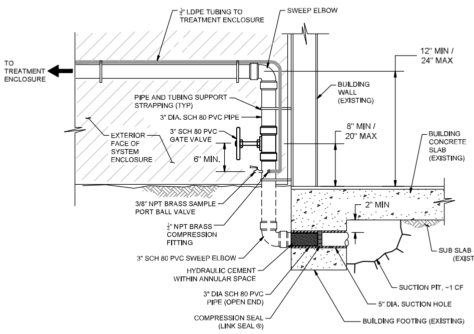
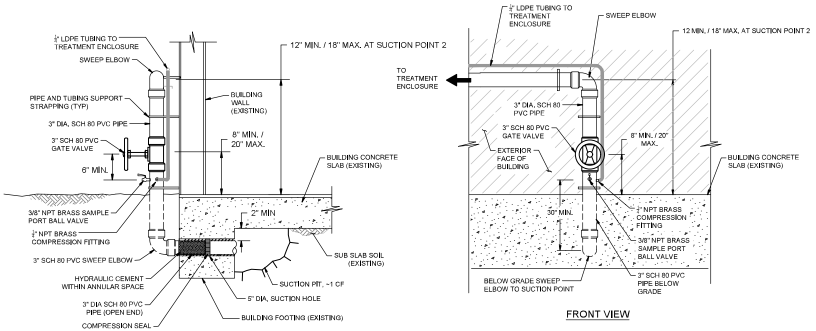


1/3 DETAIL

EXTERIOR SUCTION POINT DETAIL (STLLHOUSE CONTROL ROOM SYSTEM)

SCALE: NTS



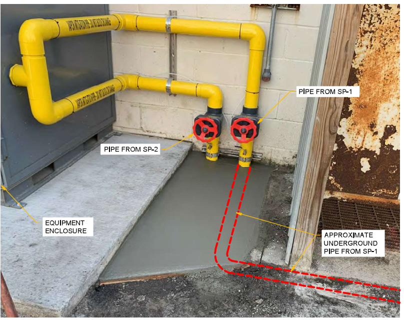
SIDE VIEW

FRONT VIEW

2/3 DETAIL

EXTERIOR SUCTION POINT SP-2 DETAIL (CHEMICAL PLANT CONTROL ROOM AND LABORATORY SYSTEM)

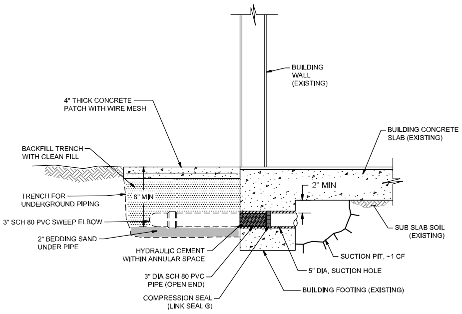
SCALE: NTS



5/3 DETAIL PHOTO

ABOVE GROUND PIPING AT SP-1 AND SP-2 (CHEMICAL PLANT CONTROL ROOM AND LABORATORY SYSTEM)

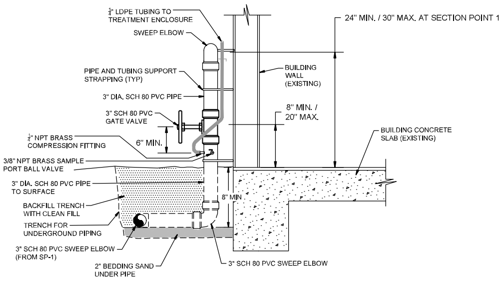
SCALE: NTS



3/3 DETAIL

EXTERIOR SUCTION POINT DETAIL FOR SP-1 (CHEMICAL PLANT CONTROL ROOM AND LABORATORY SYSTEM)

SCALE: NTS



4/3 DETAIL

UNDERGROUND PIPE TO SURFACE FROM SP-1 (CHEMICAL PLANT CONTROL ROOM AND LABORATORY SYSTEM)

SCALE: NTS

AS-BUILT DRAWINGS

(1in) (2in) (3in) (4in) SCALE IS BASED ON 22" X 34" NON-REDUCED SHEET SIZE (BORDER = 21" X 32")

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REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants

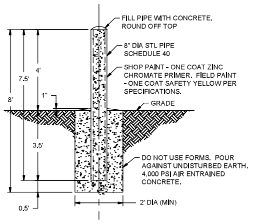
1255 ROBERTS BOULEVARD, SUITE 200
KENNESAW, GEORGIA, 30144
PHONE: 978.202.9580

TITLE: SYSTEM DETAILS I

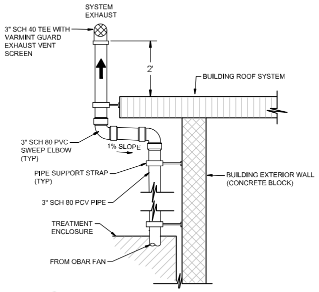
PROJECT: SUB-SLAB DEPRESSURIZATION SYSTEMS AT STILLHOUSE CONTROL ROOM AND CHEMICAL PLANT CONTROL ROOM

SITE: HERCULES / PINOVA FACILITY
2801 COOK STREET, BRUNSWICK, GEORGIA

DESIGN BY:	JK	DATE:	MARCH 2021
DRAWN BY:	RMK	PROJECT NO.:	GR6881
CHECKED BY:	JK	FILE:	
REVIEWED BY:	TC, AR	DRAWING NO.:	4 OF 7
APPROVED BY:	TC		

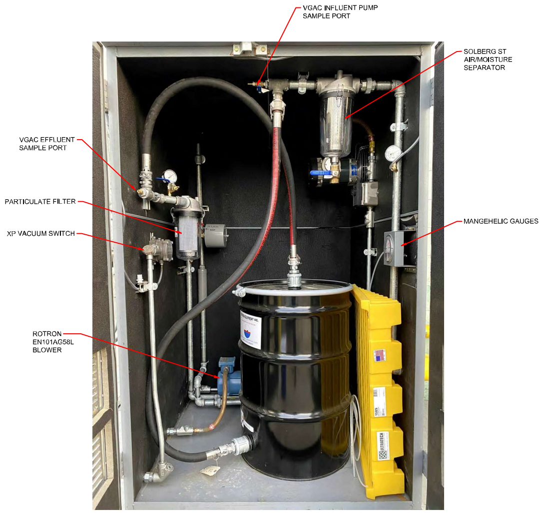


1
3
DETAIL
TYPICAL BOLLARD
SCALE: NTS



2
5
DETAIL
SYSTEM PIPING AT BUILDING ROOF
SCALE: NTS

3
3
DETAIL PHOTO
CHEMICAL PLANT CONTROL ROOM AND LAB EQUIPMENT ENCLOSURE
SCALE: NTS



4
3
DETAIL PHOTO
STILLHOUSE CONTROL ROOM EQUIPMENT ENCLOSURE
SCALE: NTS

AS-BUILT DRAWINGS

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
1255 ROBERTS BOULEVARD, SUITE 200
KENNESAW, GEORGIA, 30144
PHONE: 978.202.9580

TITLE: SYSTEM DETAILS II

PROJECT: SUB-SLAB DEPRESSURIZATION SYSTEMS AT STILLHOUSE CONTROL ROOM AND CHEMICAL PLANT CONTROL ROOM

SITE: HERCULES / PINOVA FACILITY
2801 COOK STREET, BRUNSWICK, GEORGIA

DESIGN BY:	JK	DATE:	MARCH 2021
DRAWN BY:	RMK	PROJECT NO.:	GR6881
CHECKED BY:	JK	FILE:	
REVIEWED BY:	TC, AR	DRAWING NO.:	5 OF 7
APPROVED BY:	TC		

SCALE IS BASED ON 22" X 34" NON-REDUCED SHEET SIZE (BORDER = 21" X 32")
(1in) (2in) (3in) (4in)

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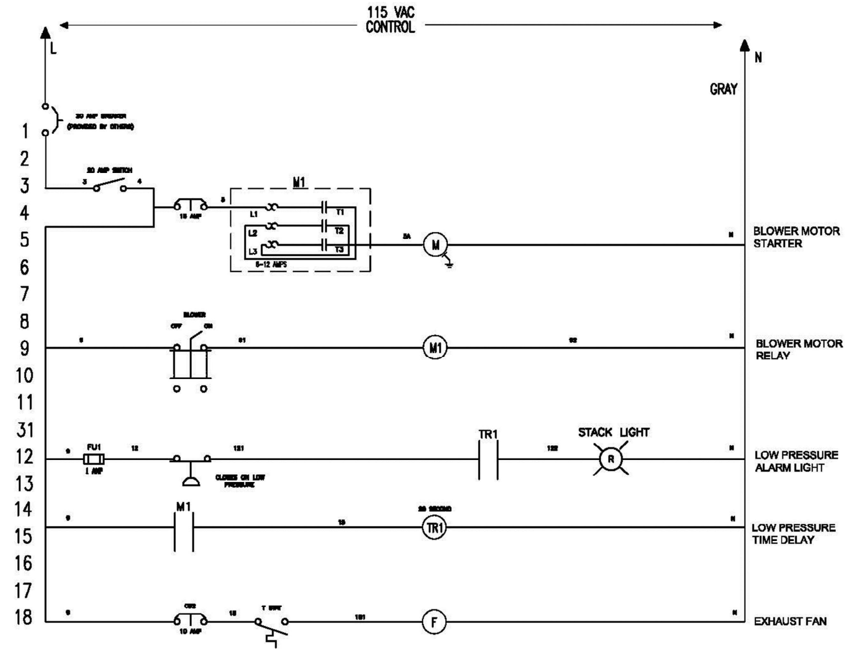
INCOMING POWER SUPPLY
115 VAC, 1 PH. , 2 WIRE + GROUND
SYSTEM FLA 14.5 AMPS

ENVIRO-EQUIPMENT

FIELD WIRING SHALL BE LISTED 75 DEG. C COPPER WIRE FOR
TERMINALS RATED LESS THAN 100.
TORQUE FIELD WIRE (I/S TERMINALS)TO 20 IN. LB. OR EQUIVALENT Nm
TORQUE FIELD WIRE(TERMINALS)TO 4.4~6.8 IN. LB. OR EQUIVALENT Nm
TORQUE FIELD WIRE(BREAKER) TO 43 IN. LB. OR EQUIVALENT Nm
TORQUE FIELD WIRE(OVERLOAD) TO 66 IN. LB. OR EQUIVALENT Nm
TORQUE FIELD(GROUND) TO 35 IN. LB. OR EQUIVALENT Nm

SET ALL MOTOR OVERLOADS TO FLA MULTIPLIED BY MOTOR SERVICE FACTOR



NOTE: ELECTRICAL DIAGRAM
PREPARED BY ENVIRO-EQUIPMENT.

AS-BUILT DRAWINGS

SCALE IS BASED ON 22" X 34" NON-REDUCED SHEET SIZE (BORDER = 21" X 32")

(1in) (2in) (3in) (4in)

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REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants

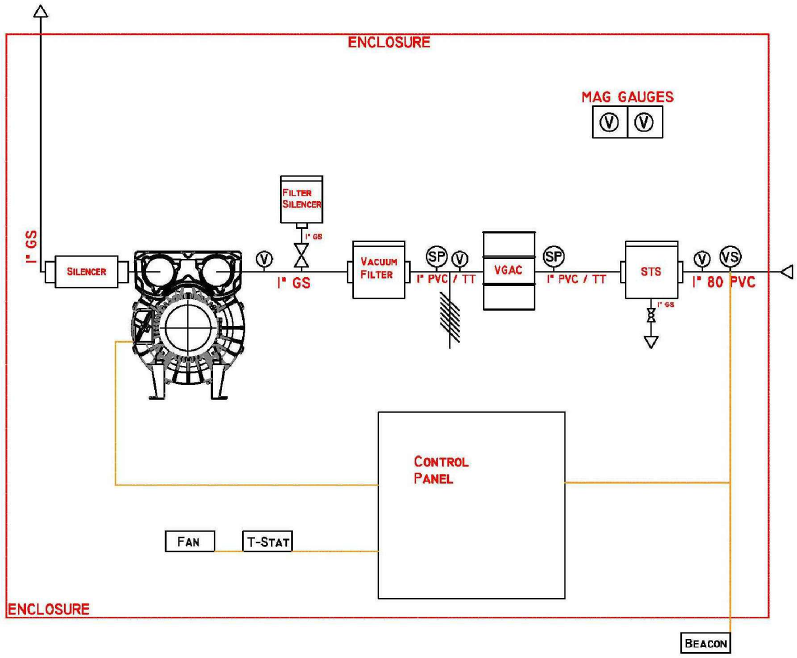
1255 ROBERTS BOULEVARD, SUITE 200
KENNESAW, GEORGIA, 30144
PHONE: 978.202.9580

TITLE: SYSTEM DETAILS III

PROJECT: SUB-SLAB DEPRESSURIZATION SYSTEMS AT STILLHOUSE CONTROL ROOM AND CHEMICAL PLANT CONTROL ROOM

SITE: HERCULES / PINOVA FACILITY
2801 COOK STREET, BRUNSWICK, GEORGIA

DESIGN BY:	JK	DATE:	MARCH 2021
DRAWN BY:	RMK	PROJECT NO.:	GR6881
CHECKED BY:	JK	FILE:	
REVIEWED BY:	TC, AR	DRAWING NO.:	
APPROVED BY:	TC	6 OF 7	



SYMBOL	DESCRIPTION
SP	Sample Port
VS	Vacuum Switch
V	Vacuum Gauge
TS	Temperature Switch
PS	Pressure Switch
P	Pressure Gauge
T	Temperature Gauge
	Relief Valve
SV	Solenoid Valve
	Wye Strainer
	Check Valve
	Gate Valve
	Ball Valve
Vacuum Filter	Vacuum Filter
Filter Silencer	Filter Silencer
	Exhaust Muffler
	Flow Meter
	Transfer Pump
	Vacuum Blower ROTRON EN101
V V	MAG GAUGES IN WALL BRACKET
STS	See through Separator
VGAC	Vapor Phase Carbon Drum
1" 80 PVC	1" Schedule 80 PVC Pipe
	Power Wiring
1" GS	1" Galvanized Steel Pipe
1" TT	1" Tanker Truck Hose

NOTE: PID DIAGRAM PREPARED
BY ENVIRO-EQUIPMENT.

AS-BUILT DRAWINGS

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants

1255 ROBERTS BOULEVARD, SUITE 200
KENNESAW, GEORGIA, 30144
PHONE: 978.202.9580

TITLE: SYSTEM DETAILS IV

PROJECT: SUB-SLAB DEPRESSURIZATION SYSTEMS AT STILLHOUSE CONTROL ROOM AND CHEMICAL PLANT CONTROL ROOM

SITE: HERCULES / PINOVA FACILITY
2801 COOK STREET, BRUNSWICK, GEORGIA

DESIGN BY:	JK	DATE:	MARCH 2021
DRAWN BY:	RMK	PROJECT NO.:	GR6881
CHECKED BY:	JK	FILE:	
REVIEWED BY:	TC, AR	DRAWING NO.:	7 OF 7
APPROVED BY:	TC		

SCALE IS BASED ON 22" X 34" NON-REDUCED SHEET SIZE (BORDER = 21" X 32")

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APPENDIX B

SSD Construction Photographic Log

Photographic Record

Client:	Hercules LLC	Project Number:	GR6881
Site Name:	Hercules LLC/Pinova Inc Facility	Site Location:	Brunswick, Georgia

Photograph 1

Date: 01/26/2021

Direction: North

Comments:
Identified location for SSD system at Chemical Plant Control Room and Laboratory

Photograph 2

Date: 01/26/2021

Direction: East

Comments:
Identified location for SSD system at Stillhouse Control Room

Photographic Record

Client:	Hercules LLC	Project Number:	GR6881
Site Name:	Hercules LLC/Pinova Inc Facility	Site Location:	Brunswick, Georgia

Photograph 3

Date: 2/16/2021

Direction: West

Comments:
SSD enclosure on new concrete pad at Chemical Plant Control Room and Laboratory

Photograph 4

Date: 2/16/2021

Direction: North

Comments:
SSD enclosure on new concrete pad at Stillhouse Control Room.

Geosyntec
consultants

Photographic Record

Client:	Hercules LLC	Project Number:	GR6881
Site Name:	Hercules LLC/Pinova Inc Facility	Site Location:	Brunswick, Georgia

Photograph 5

Date: 2/22/2021

Direction: N/A

Comments:
Suction point SP-1 and piping installed at Stillhouse Control Room

Feb 22, 2021

Photograph 6

Date: 2/23/2021

Direction: N/A

Comments:
3-inch PVC tee and varmint guard mesh screen installed at end of exhaust piping.

Feb 23, 2021

Photograph 7

Date: 2/23/2021

Direction: N/A

Comments:
Coring drill mounted and coring hole through footer at Chemical Plant Control Room and Laboratory for suction point SP-1.


Feb 23, 2021

Photograph 8

Date: 2/24/2021

Direction: N/A

Comments:
Piping laid in trench and installed through footer for suction point SP-1 at Chemical Plant Control Room and Laboratory.


Feb 24, 2021

Photographic Record

Client:	Hercules LLC	Project Number:	GR6881
Site Name:	Hercules LLC/Pinova Inc Facility	Site Location:	Brunswick, Georgia

Photograph 9

Date: 3/10/2021

Direction: N/A

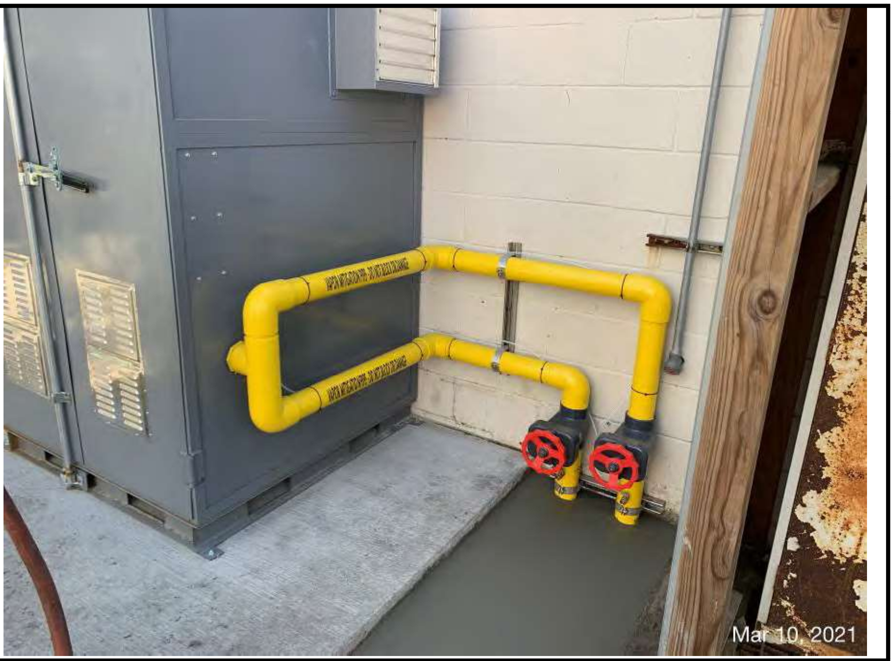
Comments:
Finished, painted and labelled vapor recovery piping at the Stillhouse Control Room.

Photograph 10

Date: 3/10/2021

Direction: N/A

Comments:
Finished, painted and labelled vapor recovery piping at the Chemical Plant Control Room and Laboratory.



APPENDIX C

Installation and Commissioning Checklists

SUB-SLAB DEPRESSURIZATION SYSTEM
INSTALLATION AND COMMISSIONING CHECKLIST
GEOSYNTEC CONSULTANTS, INC.

Checklist Completed by: Dan Gibbs Date: 3/11/21

Property Location: Chemical Plant Control Room

Geosyntec Project Number: GR6881

The purpose of this field form is to document the installation and communication testing of the sub-slab depressurization system. The goal in completing this checklist is to provide assurance that the system is functioning as intended or identify and execute action items required to achieve the intended task.

1) BUILDING INVESTIGATION

1. Building's exterior construction material (wood, stone, concrete, etc.) Concrete block

2. Cracks, holes and unsealed joints in the slab or concrete/cinder block/flagstone walls identified (seal accessible openings and document) [✓ Yes] No N/A

3. Cracks that are determined to be inaccessible or beyond the ability of the contractor to repair/seal have been disclosed to the client and included in the documentation Yes No [✓ N/A]

4. Dehumidifier being used at property Yes [✓ No] N/A

5. Floor drains – how many and locations Yes [✓ No] N/A

Floor crack observed near CTP-2; however, the crack appears to be less than 1 mm (no open space can be seen)

6. Practices observed which may affect efficiency of the mitigation system (Windows and/or door left opened) Yes [✓ No] N/A

Additional Notes:

2) MITIGATION SYSTEM INSTALLATION

Description of soil characteristics:

Dark grey fined to medium grained sand with some silt and clay. Excavated soil appeared moist.

Permits

List all permits obtained or applied for by contractor and current status:

Contractor obtained necessary work and hot work permit from Pinova personnel each__ day prior to commencing work._

Piping Installation

For any "No", complete an action item of comment.

1. Materials were excavated from the area immediately below the slab penetration point of the suction point to provide optimum pressure field extension. [✓ Yes] No
2. Vent pipes are sealed and secured so that they do not drop into suction pits or sumps. [✓ Yes] No
3. Where portions of structural framing material must be removed to accommodate vent pipes, material removed is no greater than that permitted for plumbing installations by applicable building or plumbing codes. Yes No [✓ N/A]
4. Where mitigation system installation requires pipes or ducts to penetrate a firewall or other fire resistant rated wall, floor or ceiling penetrations shall be protected in accordance with applicable building or plumbing codes. Yes No [✓ N/A]
5. Fire collar/dampener appears to be present if vent pipe penetrates fire rated wall. Yes No [✓ N/A]
6. Vent pipe/fittings are schedule 40 PVC [✓ Yes] No
7. All pipe joints and connections in the mitigation system (both interior and exterior) were primed and permanently sealed using PVC glue. (Exceptions include mitigation fan connections) [✓ Yes] No
8. Horizontal piping installed prior to the mitigation fan is pitched back to the extraction point to permit any water vapor/condensation which has collected in the pipe to drain back into the hole. [✓ Yes] No
9. Vertical and horizontal pipe runs are secured either above or below the points of penetration through floors, ceilings and roofs. [✓ Yes] No

10. Vertical pipes are supported every 8 feet and horizontal pipe runs are secured at least every 5 feet. In addition, each horizontal pipe is supported within 2 feet of each pipe fitting. [✓ Yes] No

11. Vent pipe extends at least 10-feet above the ground, and at the exhaust point ends above the eave/roof (minimum 24 inches). [✓ Yes] No

12. Vent pipes are fastened to the structure of the building with newly installed hangers and/or strapping and are not attached to pre-existing piping, duct or mechanical equipment. [✓ Yes] No

13. Piping routed exteriorly is coated against deterioration from ultra-violet radiation. [✓ Yes] No

14. Vent pipes do not block access to any areas requiring maintenance or inspection or interfere with any light, opening, door, window or equipment access area required by code. (HVAC system, etc.) [✓ Yes] No

15. A placard with contact information is mounted on exterior of the structure containing the fan and vapor treatment and is visible from a distance of at least 5 feet. Yes [✓ No]

Actions completed:
____
____

Actions not completed needing follow up:
Placards are on order, but have not arrived yet__________________________
____
____
____
____
____
____

Vent pipe system integrity

1. There are no visible openings or breaks in the pipe system. [✓ Yes] No

Comments:

Vertical vent pipe penetration(s) (to subsoil beneath the basement floor or slab)

1. The sealing/caulking around the extraction point or points through the Floor is intact. [✓ Yes] No

Comments:
An electric smoke pen was used to inspect each suction point seal on 11 March 2021 while the systems were operating and no leaks were identified.

Electrical

1. Electrical connections secure [✓ Yes] No
2. Junction boxes are closed [✓ Yes] No
3. Conduit is supported [✓ Yes] No
4. If outside the building, the mitigation fan is hard wired to a disconnect switch located internally or externally depending on local electrical code. [✓ Yes] No N/A
5. Mitigation fan appears to be wired into a dedicated circuit. (That is, not wired through any other switches, e.g., lighting wall switch.) [✓ Yes] No
6. The circuit/breaker controlling (hard-wired) the mitigation fan is labeled "SSD Fan". [✓ Yes] No
7. Wiring is not located in or chased through the mitigation installation ducting or any other heating or cooling ductwork [✓ Yes] No
8. If the rated electricity requirements of a mitigation system fan exceeds 50 percent of the circuit capacity into which it will be connected, or if the total connected load on the circuit (including the mitigation fan) exceeds 80 percent of the circuit's rated capacity, a separate, dedicated circuit is installed to power the fan. Yes No [✓ N/A]
9. An electrical disconnect switch and circuit breaker is installed in the mitigation system fan's circuits to permit deactivation of the fan for maintenance or repair. [✓ Yes] No N/A

Comments:
The power disconnection switch is installed backwards (off is on and on is off).

Mitigation Fan(s)

1. Mitigation fan is mounted securely. [✓ Yes] No

Fan connections secure [✓ Yes] No

2. Fan Model: __ROTRON_EN101AG58L_ Number of fans: _1____
3. Valve located at each extraction point (two or more extraction points in system) [✓ Yes] No N/A
4. Manometer/gauge located at each extraction point [✓ Yes] No
5. Visual alarm present and operating [✓ Yes] No
6. On/off switch for mitigation fan installed [✓ Yes] No
7. Rain cap installed at each vent pipe discharge [✓ Yes] No

Comments: Tested alarm by removing the tubing from the barb of inlet pressure gauge.________

Mitigation System Layout (Drawing) –

1. Identifying landmarks illustrated (road, North, etc.) [✓ Yes] No
2. Includes illustration of the building foundation [✓ Yes] No
3. The location of all walls, drain fixtures, sumps, HVAC systems and entry points [✓ Yes] No
4. The location of communication testing points [✓ Yes] No
5. The layout of mitigation system piping [✓ Yes] No
6. The location of mitigation fan, extraction points and system warning devices [✓ Yes] No
7. Breaker box/switches identified [✓ Yes] No
8. Measured distances from identified objects [✓ Yes] No
9. Construction modifications added to as-built markup [✓ Yes] No

Comments:____

3) VERIFICATION OF SYSTEM COMPONENTS AND CONDITION

Electrical System Performance Checklist

1. Manometer/gauge reading with electrical switch in OFF position: ___0__ Units: in H2O
2. Mitigation fan starts when switch is in ON position [✓ Yes] No
3. Verify visual alarm activates when mitigation fan is turned off Yes [✓ No]
4. Manometer reading with electrical switch in ON position: ___0_ Units:_ in H2O
5. Fan stops when switch is in OFF position [✓ Yes] No
6. Return fan to the ON position __X___ (check when completed)

Comments: Alarm is only for low pressure. Alarm does not activate when fan is turned off____

Pipe System Performance Checklist

1. Excessive noise heard in pipe joints/valve Yes [✓ No]
2. Smoke test of influent joints [✓ Yes] No
3. Did smoke enter influent joints Yes [✓ No]

Comments:

Slab Repair Performance Checklist

1. Smoke tested each identified slab crack/repair [✓ Yes] No N/A
2. Did smoke enter crack/repair Yes [✓ No] N/A
3. If yes, sealed with approved sealant Yes No [✓ N/A]
4. Leak sealed Yes No [✓ N/A]

Comments:

Fan Performance Checklist

1. Does fan produce excessive noise/vibration Yes [✓ No]
2. Vibration dampeners installed on fan [✓ Yes] No N/A
3. Fan is secure when running [✓ Yes] No
4. Does fan produce vacuum [✓ Yes] No

System Operation Checklist

1. Negative sub slab pressure [✓ Yes] No
2. Valves secured and power switch tagged with a seal [✓ Yes] No
3. System operating per design [✓ Yes] No
4. Installation/Operation accepted as complete [✓ Yes] No

Comments:

On 3/2/21 and 3/3/21, extraction point was flooded. Confirmed by pumping nearly four gallons out of extraction point pipe. No water was present on 3/11/21 and system startup was successful.

Communication Test

A Communication Test is designed to qualitatively measure the ability of a suction field and air flow through the material beneath a concrete slab floor and thus evaluate the permeability of the subsurface material. This qualitative test is commonly conducted by applying suction on a centrally located extraction well drilled through the concrete slab while simultaneously taking measurements with a digital manometer from small holes drilled in the slab at locations separated from the central suction hole.

BASELINES (3/11/2021)	Test Point 1	Test Point 2	Test Point 3
Location ID	**CTP-1**	**CTP-2**	**CTP-3**
Vacuum (Pa)	-1	0	0
PID (ppmv)	10.5	11.5	26.4
Extraction Point ID (closest)	SP-1	SP-1	SP-2
Distance from extraction point to test point	furthest	closest	Sole suction point for HVAC room

INITIAL SYSTEM START (3/11/2021)	Test Point 1	Test Point 2	Test Point 3
Location ID	**CTP-1**	**CTP-2**	**CTP-3**
Vacuum (Pa)	-3	-33	-260
PID (ppmv)	9.6	12.5	53.3
Extraction Point ID (closest)	SP-1	SP-1	SP-2
Distance from extraction point to test point	midway	furthest	Sole suction point for HVAC room

FOLLOW-UP SYSTEM START(5) (3/11/2021)	Test Point 1	Test Point 2	Test Point 3
Location ID	**CTP-1**	**CTP-2**	**CTP-3**
Vacuum (Pa)	-5	-44	-255
PID (ppmv)	15.3	14.4	56.2
Extraction Point ID (closest)	SP-1	SP-1	SP-2
Distance from extraction point to test point	midway	furthest	Sole suction point for HVAC room

Notes:
Smoke test was completed at each Test Point during baseline readings and after the initial system startup.

Referenced Footnotes:
(1) Vacuum at SP-1 was at 2.5 inWC. SP-2 gauge reading was >5 inWC. High vacuum is likely caused by water in the suction point line. Turned off SP-2.
(2) Vacuum at SP-1 and SP-2 was > 5 inWC.

(3) Closed SP-1.

(4) Pumped ~4 gallons of water from SP-2. Vacuum was 1 inWC at SP-1 and 3 inWC at SP-2.

(5) Vaccum was -3.2 inWC at SP-1 and -1.8 inWC at SP-2.

1. Vacuum measureable at each point [✓ Yes] No
2. Each fan runs when switch is in ON position [✓ Yes] No
3. All smoke tests successful [✓ Yes] No
4. Communication test completed [✓ Yes] No

Date__3/11/2021____ by ______________ (signature) ___Dan Gibbs_ (print name)

5. Confirmation of communication test measurements

Date__3/11/2021____ by ______________ (signature) _Josh Barnhart_ (print name)

Contractor Verification of System Installation and Operation Checklist

I have reviewed this form with the client's onsite representative and hereby acknowledge that the information provided is true, accurate and complete to the best of my knowledge and ability.

Contractor's Signature Ryan Harris Digitally signed by Ryan Harris Date: 2021.04.13 09:32:06 -04'00' Date_______________

4) REFERENCES:

EPA Training Manual, "Reducing Radon In Structures," (Third Edition), January 1993.

"Radon Reduction Techniques for Detached Houses, Technical Guidance (Second Edition)," EPA/625/5-87/019, January 1988.

"Application of Radon Reduction Methods," EPA/625/5-88/024, August 1988.

USEPA "A Citizen's Guide to Radon (Second Edition)"

USEPA "Consumers Guide to Radon Reduction."

SUB-SLAB DEPRESSURIZATION SYSTEM
INSTALLATION AND COMMISSIONING CHECKLIST
GEOSYNTEC CONSULTANTS, INC.

Checklist Completed by: Dan Gibbs Date: 3/11/21

Property Location: Stillhouse Control Room

Geosyntec Project Number: GR6881

The purpose of this field form is to document the installation and communication testing of the sub-slab depressurization system. The goal in completing this checklist is to provide assurance that the system is functioning as intended or identify and execute action items required to achieve the intended task.

1) BUILDING INVESTIGATION

1. Building's exterior construction material (wood, stone, concrete, etc.) Concrete block
2. Cracks, holes and unsealed joints in the slab or concrete/cinder block/flagstone walls identified (seal accessible openings and document) [✓ Yes] No N/A
3. Cracks that are determined to be inaccessible or beyond the ability of the contractor to repair/seal have been disclosed to the client and included in the documentation Yes No [✓ N/A]
4. Dehumidifier being used at property Yes [✓ No] N/A
5. Floor drains – how many and locations Yes [✓ No] N/A

Floor crack observed near CTP-2; however, the crack appears to be less than 1 mm (no open space can be seen)

6. Practices observed which may affect efficiency of the mitigation system (Windows and/or door left opened) Yes [✓ No] N/A

Additional Notes:

Building used to have a pressurization system; however, it is inactive right now. There are double doors to enter the building. The magnehelic gauge that used to monitor pressure bounced from 0 to 0.1 in H2O; but sometimes was observed to be near 0.3 in H2O. The pressure jump did not appear to correlate with any actions. No pressure was felt when opening doors to building; but opening doors appeared to effect our subslab differential pressure readings at times.

2) MITIGATION SYSTEM INSTALLATION

Description of soil characteristics:

Dark grey fined to medium grained sand with some silt and clay. Excavated soil appeared moist.

Permits

List all permits obtained or applied for by contractor and current status:

Contractor obtained necessary work and hot work permit from Pinova personnel each__ day prior to commencing work._

Piping Installation

For any "No", complete an action item of comment.

1. Materials were excavated from the area immediately below the slab penetration point of the suction point to provide optimum pressure field extension. [✓ Yes] No
2. Vent pipes are sealed and secured so that they do not drop into suction pits or sumps. [✓ Yes] No
3. Where portions of structural framing material must be removed to accommodate vent pipes, material removed is no greater than that permitted for plumbing installations by applicable building or plumbing codes. Yes No [✓ N/A]
4. Where mitigation system installation requires pipes or ducts to penetrate a firewall or other fire resistant rated wall, floor or ceiling penetrations shall be protected in accordance with applicable building or plumbing codes. Yes No [✓ N/A]
5. Fire collar/dampener appears to be present if vent pipe penetrates fire rated wall. Yes No [✓ N/A]
6. Vent pipe/fittings are schedule 40 PVC [✓ Yes] No
7. All pipe joints and connections in the mitigation system (both interior and exterior) were primed and permanently sealed using PVC glue. (Exceptions include mitigation fan connections) [✓ Yes] No
8. Horizontal piping installed prior to the mitigation fan is pitched back to the

extraction point to permit any water vapor/condensation which has collected in the pipe to drain back into the hole. [✓ Yes] No

9. Vertical and horizontal pipe runs are secured either above or below the points of penetration through floors, ceilings and roofs. [✓ Yes] No
10. Vertical pipes are supported every 8 feet and horizontal pipe runs are secured at least every 5 feet. In addition, each horizontal pipe is supported within 2 feet of each pipe fitting. [✓ Yes] No
11. Vent pipe extends at least 10-feet above the ground, and at the exhaust point ends above the eave/roof (minimum 24 inches). [✓ Yes] No
12. Vent pipes are fastened to the structure of the building with newly installed hangers and/or strapping and are not attached to pre-existing piping, duct or mechanical equipment. [✓ Yes] No
13. Piping routed exteriorly is coated against deterioration from ultra-violet radiation. [✓ Yes] No
14. Vent pipes do not block access to any areas requiring maintenance or inspection or interfere with any light, opening, door, window or equipment access area required by code. (HVAC system, etc.) [✓ Yes] No
15. A placard with contact information is mounted on exterior of the structure containing the fan and vapor treatment and is visible from a distance of at least 5 feet. Yes [✓ No]

Actions completed:

Actions not completed needing follow up:
Placards are on order, but have not arrived yet

Vent pipe system integrity

1. There are no visible openings or breaks in the pipe system. [✓ Yes] No

Comments:

Vertical vent pipe penetration(s) (to subsoil beneath the basement floor or slab)

1. The sealing/caulking around the extraction point or points through the Floor is intact. Yes [✓ No]

Comments:
An electric smoke pen was used to inspect each suction point seal on 11 March 2021 while the systems were operating and no leaks were identified.

Electrical

1. Electrical connections secure [✓ Yes] No
2. Junction boxes are closed [✓ Yes] No
3. Conduit is supported [✓ Yes] No
4. If outside the building, the mitigation fan is hard wired to a disconnect switch located internally or externally depending on local electrical code. [✓ Yes] No N/A
5. Mitigation fan appears to be wired into a dedicated circuit. (That is, not wired through any other switches, e.g., lighting wall switch.) [✓ Yes] No
6. The circuit/breaker controlling (hard-wired) the mitigation fan is labeled "SSD Fan". [✓ Yes] No
7. Wiring is not located in or chased through the mitigation installation ducting or any other heating or cooling ductwork [✓ Yes] No
8. If the rated electricity requirements of a mitigation system fan exceeds 50 percent of the circuit capacity into which it will be connected, or if the total connected load on the circuit (including the mitigation fan) exceeds 80 percent of the circuit's rated capacity, a separate, dedicated circuit is installed to power the fan. Yes No [✓ N/A]
9. An electrical disconnect switch and circuit breaker is installed in the mitigation system fan's circuits to permit deactivation of the fan for maintenance or repair. [✓ Yes] No N/A

Comments:

Mitigation Fan(s)

1. Mitigation fan is mounted securely. [✓ Yes] No

Fan connections secure [✓ Yes] No

2. Fan Model: _ROTRON_____________ Number of fans: _1_____________

3. Valve located at each extraction point (two or more extraction points in system) [✓ Yes] No N/A

4. Manometer/gauge located at each extraction point [✓ Yes] No

5. Visual alarm present and operating [✓ Yes] No

6. On/off switch for mitigation fan installed [✓ Yes] No

7. Rain cap installed at each vent pipe discharge [✓ Yes] No

Comments:_Tested alarm by removing the tubing from the barb of inlet pressure gauge.________

Mitigation System Layout (Drawing) –

1. Identifying landmarks illustrated (road, North, etc.) [✓ Yes] No
2. Includes illustration of the building foundation [✓ Yes] No
3. The location of all walls, drain fixtures, sumps, HVAC systems and entry points [✓ Yes] No
4. The location of communication testing points [✓ Yes] No
5. The layout of mitigation system piping [✓ Yes] No
6. The location of mitigation fan, extraction points and system warning devices [✓ Yes] No
7. Breaker box/switches identified [✓ Yes] No
8. Measured distances from identified objects [✓ Yes] No
9. Construction modifications added to as-built markup [✓ Yes] No

Comments:____

3) VERIFICATION OF SYSTEM COMPONENTS AND CONDITION

Electrical System Performance Checklist

1. Manometer/gauge reading with electrical switch in OFF position: ___0__ Units: in H2O
2. Mitigation fan starts when switch is in ON position [✓ Yes] No
3. Verify visual alarm activates when mitigation fan is turned off Yes [✓ No]
4. Manometer reading with electrical switch in ON position: ___0_ Units:_ in H2O
5. Fan stops when switch is in OFF position [✓ Yes] No
6. Return fan to the ON position __X___ (check when completed)

Comments:_Alarm is only for low pressure. Alarm does not activate when fan is turned off____

Pipe System Performance Checklist

1. Excessive noise heard in pipe joints/valve Yes [✓ No]
2. Smoke test of influent joints [✓ Yes] No
3. Did smoke enter influent joints Yes [✓ No]

Comments:

Slab Repair Performance Checklist

1. Smoke tested each identified slab crack/repair [✓ Yes] No N/A
2. Did smoke enter crack/repair Yes [✓ No] N/A
3. If yes, sealed with approved sealant Yes No [✓ N/A]
4. Leak sealed Yes No [✓ N/A]

Comments:

Fan Performance Checklist

1. Does fan produce excessive noise/vibration Yes [✓ No]
2. Vibration dampeners installed on fan [✓ Yes] No N/A
3. Fan is secure when running [✓ Yes] No
4. Does fan produce vacuum [✓ Yes] No

System Operation Checklist

1. Negative sub slab pressure [✓ Yes] No
2. Valves secured and power switch tagged with a seal [✓ Yes] No
3. System operating per design [✓ Yes] No
4. Installation/Operation accepted as complete Yes [✓ No]

Comments:

On 3/2/21 and 3/3/21, extraction point appears to be flooded. Confirmed by pumping nearly 4 gallons out of extraction point pipe. No water was present in suction point on 3/11/21 and system startup was completed.

Communication Test

A Communication Test is designed to qualitatively measure the ability of a suction field and air flow through the material beneath a concrete slab floor and thus evaluate the permeability of the subsurface material. This qualitative test is commonly conducted by applying suction on a centrally located extraction well drilled through the concrete slab while simultaneously taking measurements with a digital manometer from small holes drilled in the slab at locations separated from the central suction hole.

BASELINES (3/11/2021)	Test Point 1	Test Point 2	Test Point 3
Location ID	**CTP-1**	**CTP-2**	**CTP-3**
Vacuum (Pa)	-1	0	-2
PID (ppmv)	1.3	7.4	7.8
Extraction Point ID (closest)	SP-1	SP-1	SP-1
Distance from extraction point to test point	midway	furthest	closest

SYSTEM STARTUP (3/11/2021)	Test Point 1	Test Point 2	Test Point 3
Location ID	**CTP-1**	**CTP-2**	**CTP-3**
Vacuum (Pa)	-9	-12	-8
PID (ppmv)	2.1	6.2	6.8
Extraction Point ID (closest)	SP-1	SP-1	SP-1
Distance from extraction point to test point	midway	furthest	closest

Notes:

Smoke test was completed at each Test Point during baseline readings and after the initial system startup.

Referenced Footnotes:

(1) It was later observed that the SP-1 gate valve was open and system was showing some vacuum (~1 inWC). Baselines were redone on 3/3/2021.

(2) System vacuum was increased from 4.5 to 10.1 inWC to overtake water present in suction point.

(3) System was shutdown on 3/3/2021 overnight to measure new baseline readings. The system was restarted on 3/4/2021 after ~4 gallons of water was removed from SP-1.

(4) SP-1 vacuum dropped from 12.8 to 1.5 inWC.

(5) SP-1 vacuum dropped from 1.5 to 0.8 inWC. Opened gate valve to increase SP-1 vacuum to 13 inWC and closed sample valve that was observed to be open.

1. Vacuum measurable at each point [✓ Yes] No
2. Each fan runs when switch is in ON position [✓ Yes] No
3. All smoke tests successful [✓ Yes] No
4. Communication test completed [✓ Yes] No

Date__3/11/2021____ by _____________ (signature) ___Dan Gibbs_ (print name)

5. Confirmation of communication test measurements

Date__3/11/2021____ by _____________ (signature) _Josh Barnhart_ (print name)

Contractor Verification of System Installation and Operation Checklist

I have reviewed this form with the client's onsite representative and hereby acknowledge that the information provided is true, accurate and complete to the best of my knowledge and ability.

Contractor's Signature Ryan Harris Digitally signed by Ryan Harris Date: 2021.04.13 09:33:16 -04'00' Date_______________

4) REFERENCES:

EPA Training Manual, "Reducing Radon In Structures," (Third Edition), January 1993.

"Radon Reduction Techniques for Detached Houses, Technical Guidance (Second Edition)," EPA/625/5-87/019, January 1988.

"Application of Radon Reduction Methods," EPA/625/5-88/024, August 1988.

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