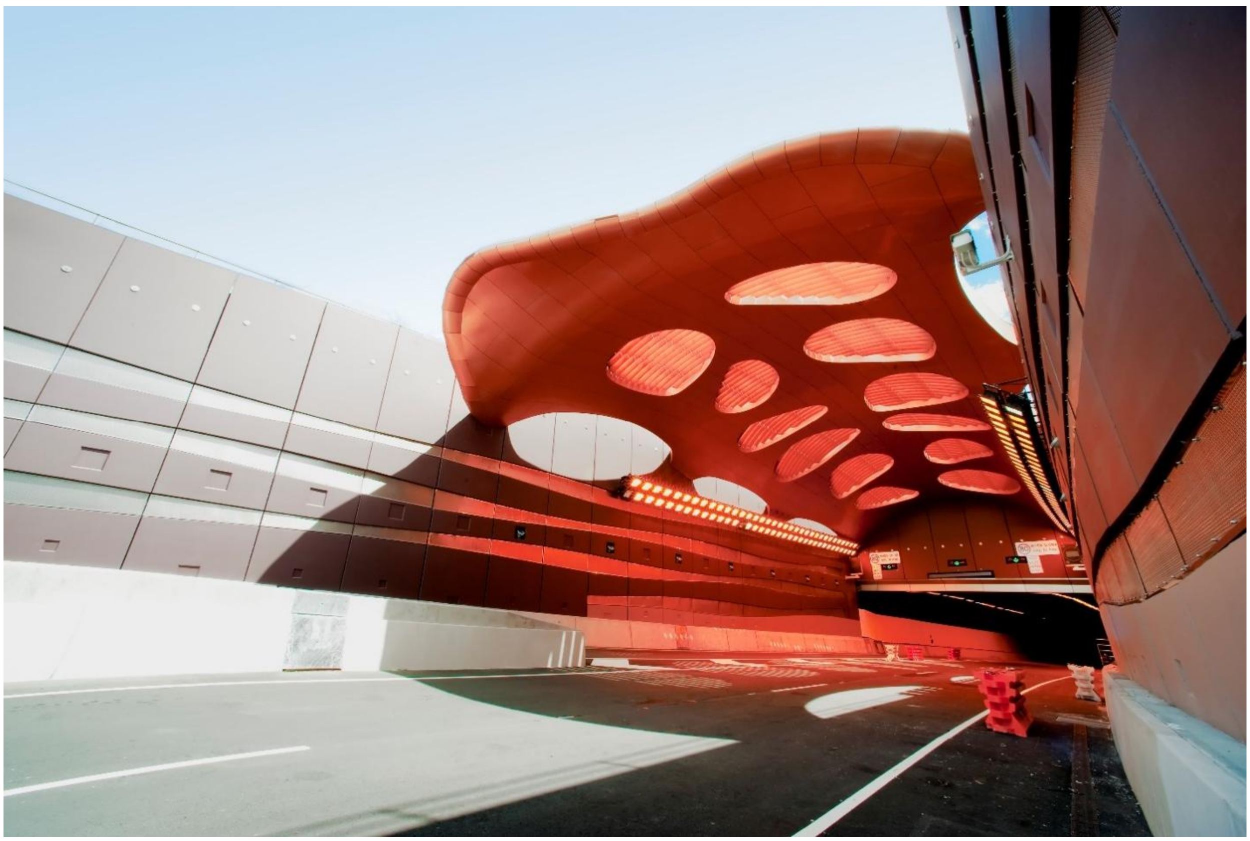
EMERSON

SUB-SLAB DEPRESSURIZATION SYSTEM INSTALLATION WORK PLAN

FORMER ROLLWAY BEARING FACILITY, LIVERPOOL, NEW YORK

FEBRUARY 04, 2020



SUB-SLAB DEPRESSURIZATION SYSTEM INSTALLATION WORK PLAN

FORMER ROLLWAY BEARING FACILITY
LIVERPOOL, NEW YORK

EMERSON

PROJECT NO.:31401545.018
DATE: FEBRUARY 04, 2020

WSP
BUILDING D, 2ND FLOOR
7000 EAST GENESEE STREET
FAYETTEVILLE, NY 13066

TEL.: +1 315 655-3900
FAX: +1 315 655-3907
WSP.COM

TABLE OF CONTENTS

1 INTRODUCTION

On behalf of Emerson Electric Co. (Emerson), WSP USA Inc. (WSP) has prepared this work plan detailing the design and installation of a sub-slab depressurization (SSD) system at the former Rollway Bearing Corporation facility at 7600 Morgan Road in Liverpool, New York (Site). The proposed SSD system design was initially submitted to the New York State Department of Environmental Conservation (NYSDEC) in the Sub-slab Soil Vapor Sampling Report, dated October 28, 2019, which summarized the results of sub-slab soil vapor samples collected within the former manufacturing building in March 2019. During a telephone conversation with the NYSDEC on November 6, 2019, the agency requested that a formal work plan be submitted for the system installation.

The objective the of the SSD system is to address the potential for vapor intrusion associated with volatile organic compounds (VOCs) remaining in sub-slab soil vapor. The system design is based on the results of sub-slab communication testing performed in August 2018 and reported to the NYSDEC in the quarterly progress report for the site, dated November 15, 2018, and the results of the March 2019 sub-slab soil vapor sampling reported to NYSDEC on October 28, 2019, and summarized in this document.

The Site is currently in the New York State Voluntary Cleanup Program, Site No. V00202, which is administered by NYSDEC. On June 14, 2001, Emerson and Rollway Bearing Corporation entered into a Voluntary Cleanup Agreement with the NYSDEC to investigate and remediate the site. Emerson received a Release and Covenant Not To Sue from the NYDEC on March 21, 2018.

2 BACKGROUND

The proposed SSD system design is based on the results of SSD pilot testing performed in August 2018 and sub-slab soil vapor sampling activities performed in March 2019. A summary of the implementation and results of each of these activities is provided below.

2.1 SUB-SLAB DEPRESSURIZATION PILOT TESTING

WSP conducted SSD pilot testing from July 30 through August 2, 2018, to gather site-specific data required to design and operate a full-scale system. The pilot test consisted of two components, a stepped-rate test and a constant-rate test, to evaluate the vacuum response of the sub-surface by applying vacuum at three temporary SSD vapor extraction test points (EX-1, EX-2, and EX-3; Sheet 2) using a consumer-grade shop vacuum. During pilot testing, subsurface vacuum levels were measured from temporary 5/8-inch diameter vacuum monitoring points drilled through the slab (MP-1 through MP-10 for EX-1, MP-11 through MP-19 for EX-2, and MP-20 through MP-29 for EX-3) located at distances of 5 to 63 feet from EX-1, 5 to 73 feet from EX-2, and 5 to 60 feet from EX-3 (Sheet 2). Pilot test data was used to determine vacuum, flow response, and expected radius of influence.

2.1.1 *EXTRACTION POINT INSTALLATION*

The temporary SSD vapor extraction test points (EX-1 through EX-3) were installed by advancing a 4.5-inch diameter concrete core bit through the concrete slab into the subsurface material. Approximately 4 inches of subsurface material was removed to create a sump and to remove wetted material generated from the coring activities. During installation, the subsurface material beneath the slab was observed to be a silt with some clay and gravel at EX-1, sand at EX-2, and a well-graded gravel with clay at EX-3. Materials removed from the extraction point sumps was placed in a steel, U.S. Department of Transportation (DOT)-compliant 55-gallon drum for characterization and offsite disposal.

A 2-foot-long section of 1.5-inch-diameter polyvinyl chloride pipe (PVC) was expanded to 4-inch-diameter (i.e., using reducers) and the pipe was placed in the cored hole, flush with the bottom of the concrete slab. The pipe was temporarily sealed in place with a non-VOC-containing molding clay. The pipe was temporarily plumbed to a manifold with an air dilution valve, sampling port, and temperature, pressure, and flow measuring instruments.

2.1.2 *STEPPED-RATE TEST*

The purpose of the stepped-rate tests was to determine the applied vacuum that achieves the largest radius of influence (ROI) while optimizing the flow rate. The stepped-rate test consisted of applying incremental vacuum levels to extraction points EX-1 through EX-3 separately, and measuring the stabilized vapor flow rate corresponding to each vacuum level. The vacuum levels achieved in each of the temporary monitoring points were measured using a digital micromanometer during each step. The applied vacuum and vapor flow rate were regulated with an air-dilution valve. Three or four steps, each with a duration of approximately 10 to 20 minutes, were completed with the dilution valve opened 100 percent, with the valve completely closed, and with the valve set at one or two intermediate settings. In addition, the extracted vapor was monitored for VOCs using a photoionization detector (PID) with a 10.6 electron volt (eV) lamp. All vapors extracted from the sub-slab during pilot testing activities were vented to the ambient air outside the facility using flexible acrylonitrile butadiene styrene (ABS) plastic hose connected to the piping manifold.

Using instrumentation installed on the inlet and dilution valve piping, differential pressure, temperature, and pressure (or vacuum) were measured. Vapor flow rates were then calculated based on these parameters using an averaging pitot tube-style flow sensor.

2.2 CONSTANT-RATE TEST

The purpose of the constant-rate tests was to evaluate the sub-surface response to long-term sub-slab depressurization by application of the optimal vacuum setting, as determined during the stepped-rate test, until subsurface conditions equilibrated (i.e., vacuum levels at the extraction point and monitoring locations stabilized). Data derived from the constant-rate test was used for selection of mitigation fans and spacing of extraction points.

For these tests, the optimal vacuum level and flow rate were applied to each extraction point for approximately one hour. Vacuum levels at each of the monitoring points, the applied vacuum at the extraction point, and the vapor extraction flow rate were measured and recorded to evaluate response trends over time. The vacuum measurements obtained from each temporary monitoring point during the constant-rate tests at EX-1, EX-2, and EX-3 are presented in Sheet 2.

2.3 SUB-SLAB VAPOR SAMPLING

In March 2019, sub-slab soil vapor samples were collected at 13 locations within the former manufacturing building in accordance with the Notification of Sub-slab Soil Vapor Sampling, dated February 22, 2019, and approved by the NYSDEC in a letter, dated March 14, 2019. The objective of the sampling activities was to evaluate current sub-slab soil vapor conditions at select locations that were sampled in 2006 and 2007 (i.e., SS-1, SS-3, SS-12, SS-14, and SS-15, and SS-16; Sheet 2), and to further delineate the extent of VOCs in sub-slab soil vapor in the former heat treat area (i.e., SS-17) and in the western portion of the former manufacturing building (i.e., SS-16 and SS-18). The sub-slab samples were analyzed for the following VOCs assigned to the NYSDOH's May 2017 soil vapor/indoor air matrices: trichloroethene (TCE); tetrachloroethane (PCE); *cis*-1,2-dichloroethene (*cis*-1,2-DCE); 1,1,1-trichloroethane (1,1,1-TCA); vinyl chloride; methylene chloride; 1,1-dichloroethene; and carbon tetrachloride using U.S. Environmental Protection Agency Method TO-15.

As indicated in Sheet 2, TCE and PCE were the compounds detected at the highest concentrations in sub-slab soil vapor and were the only VOCs detected at all locations sampled in March 2019. TCE concentrations ranged from 0.20 $\mu g/m^3$ at SS-14 to 62,000 $\mu g/m^3$ at SS-12. PCE concentrations ranged from 0.34 $\mu g/m^3$ at SS-14 to 3,300 $\mu g/m^3$ at SS-12. Consistent with the historical sub-slab soil vapor results, the highest VOC concentrations were detected at SS-12 during the March 2019 sampling event.

A comparison of the 2006 and 2007 sub-slab soil vapor sampling results to the March 2019 results indicate a decrease in TCE concentrations at each of the six locations that were re-sampled. The decrease in TCE concentrations ranged from 58 percent at location SS-3 to greater than 99 percent at locations SS-14 and SS-15. The March 2019 sub-slab soil vapor sample from SS-12 contained a significantly lower concentration of TCE (46,000 $\mu g/m^3$ and 62,000 $\mu g/m^3$), as compared to the 2007 sample, which contained 1,600,000 $\mu g/m^3$ of TCE (i.e., a decrease of approximately 96 percent). The 2007 sample from SS-12 also contained a significantly higher concentration of *cis*-1,2-DCE (22,000 $\mu g/m^3$) as compared to the March 2019 samples, which contained 620 $\mu g/m^3$ and 810 $\mu g/m^3$ of this compound. In general, the concentrations of the remaining VOCs detected in the March 2019 samples were similar to historical concentrations. A complete summary of the March 2019 sub-slab soil vapor sampling activities is provided in the Subslab Soil Vapor Sampling Report, dated October 28, 2019.

3 SUB-SLAB DEPRESSURIZATON SYSTEM DESIGN

A full-scale SSD system has been designed to mitigate the potential for vapor intrusion to indoor air in the eastern portion of the building where elevated VOC concentrations remain in sub-slab vapor (Sheet 2). The proposed SSD system is comprised of 23 sub-slab extraction points (SSD-1 through SSD-23) connected to 19 exterior mounted fans. The suction points are organized into 16 individual legs (SSD-1 through SSD-12 and SSD-18 through SSD-21) each consisting of a single suction point connected to a dedicated fan, and three legs consisting of multiple suction points connected to a single fan using a manifold (SSD-13 and SSD-15; SSD-14 and SSD-16; and SSD-17, SSD-22, and SSD-23). The proposed layout of the SSD system is shown on Sheet 2.

3.1 EXTRACTION POINTS

All extraction points will be constructed by wet concrete coring and excavating an approximately 12-inch-diameter by 12-inch-deep pit into the subgrade below the concrete floor slab. To promote the efficient removal of sub-slab vapor, each excavated pit will first be filled with an 8-inch thick (minimum) washed gravel layer consisting of ½ to ¾-inch aggregate. The gravel layer within the pit provides a greater surface area (exposed subgrade soil surface) for vacuum application. A 3-inch diameter, Schedule 40 PVC extraction pipe will be placed on top of the gravel layer in each excavated pit and stubbed-up vertically and secured to an adjacent column using appropriately-sized piping clamps.

Vapor transfer piping consisting of 3-inch diameter, Schedule 40 PVC pipe will be connected to each of the stubbed-up extraction pipes and routed vertically to the building's roof structure and then horizontally to an exterior wall as shown on Sheet 3. Lockable lever-handle, 3-inch diameter PVC butterfly valves (Hayward BYCN10301 LGB or equivalent) will be installed at each riser for maintenance activities and for adjusting the flow to each SSD point to enable the greatest vacuum across the targeted areas of the sub-slab (Sheet 2). Following the SSD extraction point excavations, the soil spoils and concrete will be containerized, labeled, and moved to an onsite storage area. The soil and concrete will be characterized and promptly disposed of offsite in accordance with all applicable requirements.

Concrete removed for the extraction points will be replaced to match the pre-existing conditions (grade, surface finish, and control joint spacing). Replacement concrete will also match the existing reinforcement and slab thickness and meet 3,500 pounds per square inch compressive strength after 28 days of curing. If no reinforcement is observed, at a minimum, the concrete will be reinforced with welded wire fabric (4x4-W1.4xW1.4) centered in the concrete slab. Prior to placing the concrete, deformities in the exposed concrete face will be patched to allow full bonding of new concrete with existing concrete. All concrete will be underlain by 6 mil plastic sheeting. Restored joints will be sealed with Sika Sikaflex® polyurethane sealant (or equivalent). Concrete restoration details are provided on Sheet 3.

Following concrete restoration, 36-inch tall steel pipe guards (Omega OM3310CM or Omega OM3310) will be installed around each riser to minimize the risk of damage from heavy machinery and forklift traffic as shown on Sheet 3. The pipe guards will be anchored to the column or wall with 9/16-inch diameter screws or anchors in accordance with the manufacturer's recommendations, SSD System Vapor Transfer Piping.

For SSDs with a single extraction point, conveyance piping will be hung horizontally from the bottom of minor roof trusses and connect to an extraction fan and exhaust stack mounted on the exterior of the building. For SSDs with multiple extraction points, the transfer piping will connect to a common header pipe before exiting the building. Horizontal conveyance piping will be hung using Unistrut® channel or appropriately sized piping hangers from the roof structure to support piping at a minimum of 20 inches below the building's roof structure. All above-grade SSD transfer piping will be sloped approximately 1%, towards each suction point riser pipe as shown in Sheet 3. Trapeze strut hangers will be suspended from the structural members where multiple conveyance lines are being hung in parallel such as at SSD-5/SSD-09/SSD-18, SSD-6/SSD-10/SSD-19, and SSD-7/SSD-11/SSD-20 piping routes. The actual pipe runs may be modified in the field as needed to accommodate site conditions.

3.2 EQUIPMENT AND INSTRUMENTATION

Wall penetrations will be created at 19 locations to route conveyance piping to the exterior of the facility. On the exterior side of each wall penetration, an inline fan (RadonAway™ model HS5000) will be installed to depressurize the slab and exhaust the vapors to the atmosphere (Sheet 3). The inline fan will be equipped with a condensate bypass to minimize the potential for water draining into the fan, a potential hazard that could decrease the life of the fan.

Discharge piping from the fan's outlet will consist of 2-inch diameter Schedule 40 PVC, as specified by the fan manufacturer. The discharge stack after the fan will be equipped with a 3-inch weather-proof vent screen and rain hood as specified in Sheet 3. The discharge stack and fan mount will be properly secured to the exterior wall as shown on Sheet 3. The discharge stack shall terminate a minimum of 2 feet above the roof structure and at least 10 feet horizontally from any of the building's air handling equipment intakes or windows. All exterior PVC piping and fittings will be coated for UV protection with a white, water-based latex paint, or similar. Warning labels as specified on Sheet 3 will be placed on the SSD conveyance piping and master switch.

A dedicated electrical connection will be installed between the existing 120 Volt, single phase electrical supply (located inside the building) and the fan's weather-proof electrical switch box as shown on Sheet 3. Dedicated electrical service for the 19 inline fans will be divided among the appropriate number of dedicated circuit breakers based on the amp draw of the fans and the amperage allowed by each circuit breaker. The electrical wiring will be routed along interior walls or along the roof structure using electrical metallic tubing (EMT) conduit and vertically down to an electrical service panel inside the building using appropriate clamps, straps, or hangers. A master shut-off switch will be installed inside the building, in-line between the electrical supply and the exterior switch box.

At the electrical service panel, a locking clip will be affixed to the breaker operating the circuit that operates the fan(s). At interior wall penetrations, the concrete block wall will be restored with cement grout around the annulus between the pipe and penetration. On the exterior side of each wall penetration, a pipe boot (Dektite® EZi-Seal or similar) will be installed around the discharge pipe which contours to the sheet metal panel and ensures a weatherproof seal.

For performance monitoring of the SSD System, a sample port and inline differential pressure gauge configured for vacuum measurement (Dwyer® DM-1000 Series Digimag®) will be installed at each extraction point riser as shown on Sheet 3. The sample port will be configured to allow for future in-line flow measurements, as needed, using an averaging pitot tube such as a Dwyer® Series DS Flow Sensor.

4 SYSTEM STARTUP, CONFIRMATION TESTING, AND EMISSIONS SAMPLING

Initial testing will be conducted to verify proper operation of each SSD system component and instrumentation before the system is brought on-line. Once the systems are fully operational, the air flow to each of the grouped SSD extraction points will be manually balanced by adjusting the butterfly valves located on each vertical riser pipe. The air flow at the SSD extraction points will be considered balanced when the system produces the largest vacuum influence. Vacuum below the slab will be measured at appropriate monitoring points using a digital micromanometer. Isolation tests of each riser will be conducted as necessary to determine the vacuum radius of influence of each extraction point. Smoke testing will be performed in the vicinity of a riser (i.e., within a 30 to 40-foot radius) if a potential leak is suspected.

After the installation of the SSD system and approximately 6 to 12 months of continuous operation to allow the system to equilibrate, vacuum will be measured again at appropriate monitoring points using a digital micromanometer. The vacuum measurements will be evaluated to confirm that the SSD system effectively controls sub-slab vapor in the affected areas.

5 OPERATION, MAINTENANCE, AND MONITORING

The SSD system's operation, maintenance, and monitoring (OM&M) plan will be incorporated into the SMP for the Site. The SSD system will be inspected bi-monthly, at a minimum, to ensure that the system continues to operate as designed. During each inspection, the concrete floor surrounding the extraction sumps and protective bollards will be inspected for cracks to prevent the loss of vacuum through short-circuiting and to ensure that there are no pathways for vapors to enter the building. Any significant cracks or breaches discovered will be documented and repaired. Inspections will also cover all system components, including vacuum conveyance piping, fittings, sampling and gauge ports, vacuum gauges, fans, exhaust stacks, and piping supports. Inspection of system components will be completed through visual inspection from ground level. If required, overhead lifts or ladders will be utilized to troubleshoot potential defects in elevated components.

Applied vacuum will be measured and documented for submittal to NYSDEC during each inspection at each riser. If any cracks, breaches, or other deficiencies in system components are observed, or if the applied vacuum for an extraction point varies by more than 20% from equalized measurements, corrective action will be taken within 30 days of discovery. Corrective actions may include patching or replacement of concrete, piping, or other system components. A checklist will be completed during each inspection and the completed forms will be included in the quarterly progress reports and the annual Periodic Review Report.

Non-routine inspections, such as in the event of an emergency or a suspected failure of the engineering control, will be performed in accordance with the SMP. As required, notification to NYSDEC will be conducted by noon on the day following any emergency, such as a fire, flood, or earthquake, that reduces or has the potential to reduce the effectiveness of the SSD system at the site, with written confirmation to the NYSDEC within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public. In addition, an inspection of the site will be conducted within 48 hours of any suspected damage or defect to the SSD engineering control to verify the effectiveness of the SSD engineering control by a qualified environmental professional, as determined by the NYSDEC.

6 TERMINATION OF OPERATION

The framework for determining when the engineering control is no longer required is provided in Section 4.5 of NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*. The SSD System will not be discontinued unless prior written approval is granted by the NYSDEC and NYSDOH. In the event that monitoring data indicates that the system may no longer be required, a petition to discontinue operation of the SSD System will be submitted to the agencies.

7 REPORTING

WSP will prepare a Final Report documenting the installation and startup of the SSD systems and will include an operation, maintenance, and monitoring plan. The report will describe the activities completed, any changes made to the technical approach as a result of unanticipated site conditions, and will contain as-built drawings of the system.

8 ACRONYMS

µg/m^3	micrograms per cubic meter
ABS	acrylonitrile butadiene styrene
cis-1,2-DCE	*cis*-1,2-dichloroethene
EMT	electrical metallic tubing
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OM&M	operation, maintenance, and monitoring
PCE	tetrachloroethene
PVC	polyvinyl chloride
ROI	radius of influence
SMP	site management plan
SSD	sub-slab depressurization
1,1,1-TCA	1,1,1-Trichloroethane
TCE	trichloroethene
VOCs	volatile organic compounds

SHEETS

INDEX OF DRAWINGS

DRAWING NUMBER	SHEET NUMBER	DESCRIPTION
314P1545.018-D03	1	TITLE SHEET
314P1545.018-D08	2	PROPOSED SSD SYSTEM LAYOUT
314P1545.018-D06	3	SSD SYSTEM CONSTRUCTION DETAILS

TITLE SHEET

SUB-SLAB DEPRESSURIZATION SYSTEM DESIGN

FORMER ROLLWAY BEARING FACILITY
LIVERPOOL, NEW YORK

PREPARED FOR

EMERSON
ST. LOUIS, MISSOURI

D

REVISIONS

REV	DESCRIPTION

SEAL

DATE

DRAWN BY RL 10042018

CHECKED DCC 05312019

APPROVED

PROPERTY OF WSP USA INC.

IMPORTANT: THIS DRAWING PRINT IS LOANED FOR MUTUAL ASSISTANCE AND AS SUCH IS SUBJECT TO RECALL AT ANY TIME. INFORMATION CONTAINED HEREON IS NOT TO BE DISCLOSED OR REPRODUCED IN ANY FORM FOR THE BENEFIT OF PARTIES OTHER THAN NECESSARY SUBCONTRACTORS AND SUPPLIERS WITHOUT THE WRITTEN CONSENT OF WSP USA INC.

NOTICE: THIS DRAWING HAS BEEN PREPARED UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IT IS A VIOLATION OF STATE LAW FOR ANY PERSONS, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT IN ANY WAY.

TITLE SHEET

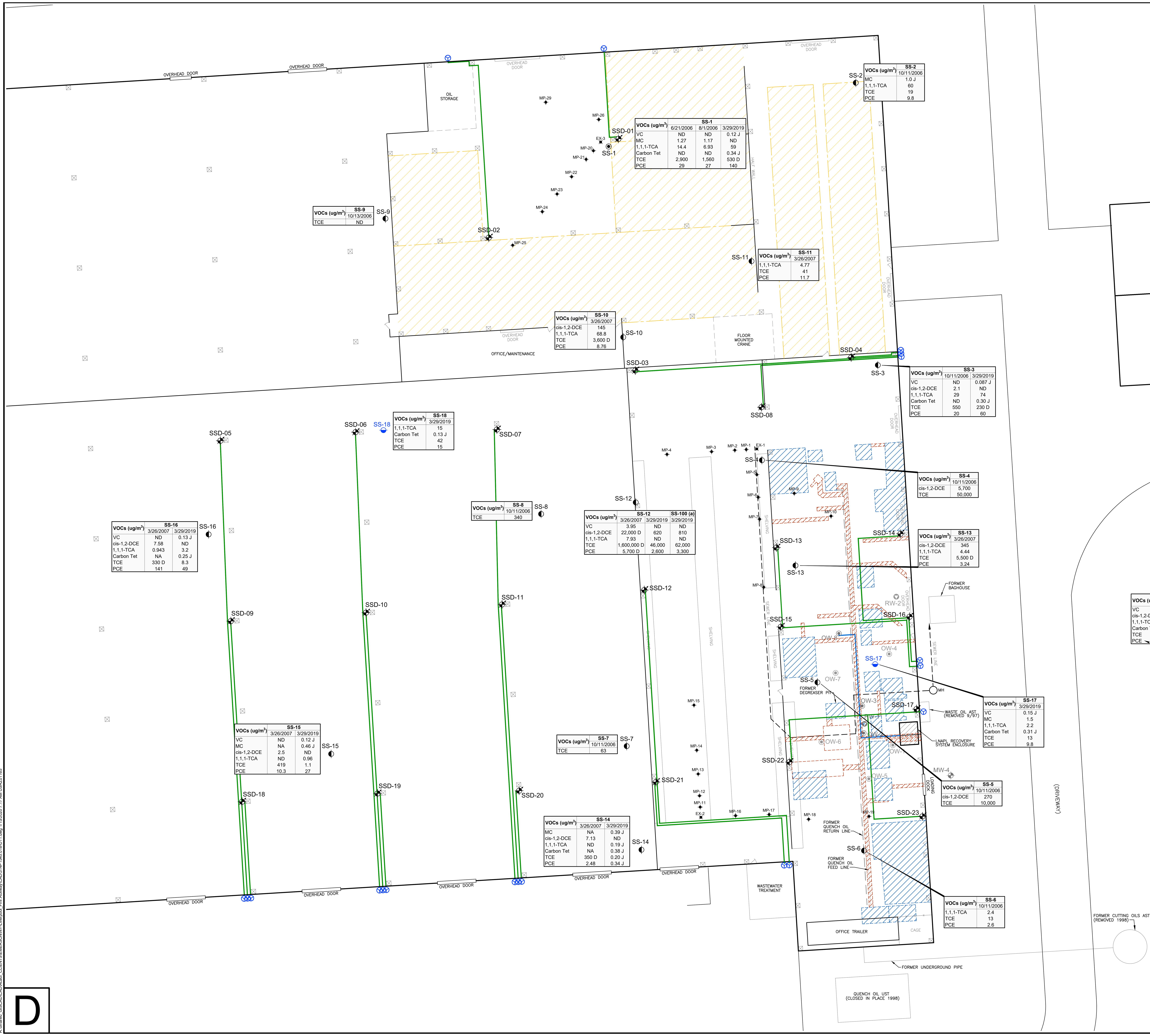
FORMER ROLLWAY BEARING FACILITY
LIVERPOOL, NEW YORK

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

WSP USA Inc.
7000 E. GENESEE ST. BLDG D, 2ND FLOOR
FAYETTEVILLE, NY 13066
TEL: +1 315.655.3900

SHEET 1

Drawing Number
314P1545.018-D03



VOCs (ug/m3)	SS-1		
	6/21/2006	8/1/2006	3/29/2019
VC	ND	ND	0.12 J
MC	1.27	1.17	ND
1,1,1-TCA	14.4	6.93	59
Carbon Tet	ND	ND	0.34 J
TCE	2,900	1,560	530 D
PCE	29	27	140

VOCs (ug/m3)	SS-2
	10/11/2006
MC	1.0 J
1,1,1-TCA	60
TCE	19
PCE	9.8

VOCs (ug/m3)	SS-9
	10/13/2006
TCE	ND

VOCs (ug/m3)	SS-11
	3/26/2007
1,1,1-TCA	4.77
TCE	41
PCE	11.7

VOCs (ug/m3)	SS-10
	3/26/2007
cis-1,2-DCE	145
1,1,1-TCA	68.8
TCE	3,600 D
PCE	8.76

VOCs (ug/m3)	SS-3	
	10/11/2006	3/29/2019
VC	ND	0.087 J
cis-1,2-DCE	2.1	ND
1,1,1-TCA	29	74
Carbon Tet	ND	0.30 J
TCE	550	230 D
PCE	20	60

VOCs (ug/m3)	SS-18
	3/29/2019
1,1,1-TCA	15
Carbon Tet	0.13 J
TCE	42
PCE	15

VOCs (ug/m3)	SS-4
	10/11/2006
cis-1,2-DCE	5,700
TCE	50,000

VOCs (ug/m3)	SS-8
	10/11/2006
TCE	340

VOCs (ug/m3)	SS-12		SS-100 (a)
	3/26/2007	3/29/2019	3/29/2019
VC	3.95	ND	ND
cis-1,2-DCE	22,000 D	620	810
1,1,1-TCA	7.93	ND	ND
TCE	1,600,000 D	46,000	62,000
PCE	5,700 D	2,600	3,300

VOCs (ug/m3)	SS-16	
	3/26/2007	3/29/2019
VC	ND	0.13 J
cis-1,2-DCE	7.58	ND
1,1,1-TCA	0.943	3.2
Carbon Tet	NA	0.25 J
TCE	330 D	8.3
PCE	141	49

VOCs (ug/m3)	SS-13
	3/26/2007
cis-1,2-DCE	345
1,1,1-TCA	4.44
TCE	5,500 D
PCE	3.24

VOCs (ug/m3)	SS-17
	3/29/2019
VC	0.15 J
MC	1.5
1,1,1-TCA	2.2
Carbon Tet	0.31 J
TCE	13
PCE	9.8

VOCs (ug/m3)	SS-15	
	3/26/2007	3/29/2019
VC	ND	0.12 J
MC	NA	0.46 J
cis-1,2-DCE	2.5	ND
1,1,1-TCA	ND	0.96
TCE	419	1.1
PCE	10.3	27

VOCs (ug/m3)	SS-7
	10/11/2006
TCE	63

VOCs (ug/m3)	SS-5
	10/11/2006
cis-1,2-DCE	270
TCE	10,000

VOCs (ug/m3)	SS-14	
	3/26/2007	3/29/2019
MC	NA	0.39 J
cis-1,2-DCE	7.13	ND
1,1,1-TCA	ND	0.19 J
Carbon Tet	NA	0.38 J
TCE	350 D	0.20 J
PCE	2.48	0.34 J

VOCs (ug/m3)	SS-6
	10/11/2006
1,1,1-TCA	2.4
TCE	13
PCE	2.6

LEGEND

- MW-4 — MONITORING WELL
- SS-17 — SUB-SLAB VAPOR SAMPLE (MARCH 2019)
- SS-4 — SUB-SLAB VAPOR MONITORING POINT
- OW-3 — OBSERVATION WELL CONNECTED TO LNAPL RECOVERY SYSTEM
- RW-1 — RECOVERY WELL CONNECTED TO LNAPL RECOVERY SYSTEM
- MP-17 — 5/8" VAPOR MONITORING POINT
- EX-2 — PILOT TEST EXTRACTION POINT
- SSD-15 — PROPOSED SSD SYSTEM EXTRACTION POINT
- PROPOSED SSD SYSTEM DISCHARGE FAN
- COLUMN
- FORMER PIT FILLED AND CAPPED WITH CONCRETE
- FORMER PIT TRENCH
- LOCATION OF OVERHEAD CRANE
- LNAPL RECOVERY SYSTEM AIR CONVEYANCE PIPING
- PROPOSED ABOVEGROUND SSD SYSTEM PIPING

VOCs (ug/m3)	SS-3	
	10/11/2006	3/29/2019
VC	ND	0.087 J
cis-1,2-DCE	2.1	ND
1,1,1-TCA	29	74
Carbon Tet	ND	0.30 J
TCE	550	230 D
PCE	20	60

SAMPLE LOCATION
SAMPLE COLLECTION DATE
CONCENTRATION IN MICROGRAMS PER CUBIC METER
CONSTITUENT

- J — ESTIMATED CONCENTRATION
- D — RESULT IS FROM A DILUTION
- ND — NOT DETECTED
- NA — NOT ANALYZED FOR THIS PARAMETER
- VOCs — VOLATILE ORGANIC COMPOUNDS
- VC — VINYL CHLORIDE
- MC — METHYLENE CHLORIDE
- DCE — DICHLOROETHENE
- TCA — TRICHLOROETHANE
- Carbon Tet — CARBON TETRACHLORIDE
- TCE — TRICLOROETHENE
- PCE — TETRACHLOROETHENE

THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK & WHITE REPRODUCTION MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.

REVISIONS
REV | DESCRIPTION

SEAL
DRAWN BY
CHECKED
APPROVED

PROPERTY OF WSP USA INC. IMPORTANT: THIS DRAWING PRINT IS LOANED FOR MUTUAL ASSISTANCE AND AS SUCH IS SUBJECT TO RECALL AT ANY TIME. INFORMATION CONTAINED HEREON IS NOT TO BE DISCLOSED OR REPRODUCED IN ANY FORM FOR THE BENEFIT OF PARTIES OTHER THAN NECESSARY SUBCONTRACTORS & SUPPLIERS WITHOUT THE WRITTEN CONSENT OF WSP USA INC.

NOTICE: THIS DRAWING HAS BEEN PREPARED UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER. IT IS A VIOLATION OF STATE LAW FOR ANY PERSONS, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT IN ANY WAY.

PROPOSED SSD SYSTEM LAYOUT

FORMER ROLLWAY BEARING FACILITY
LIVERPOOL, NEW YORK

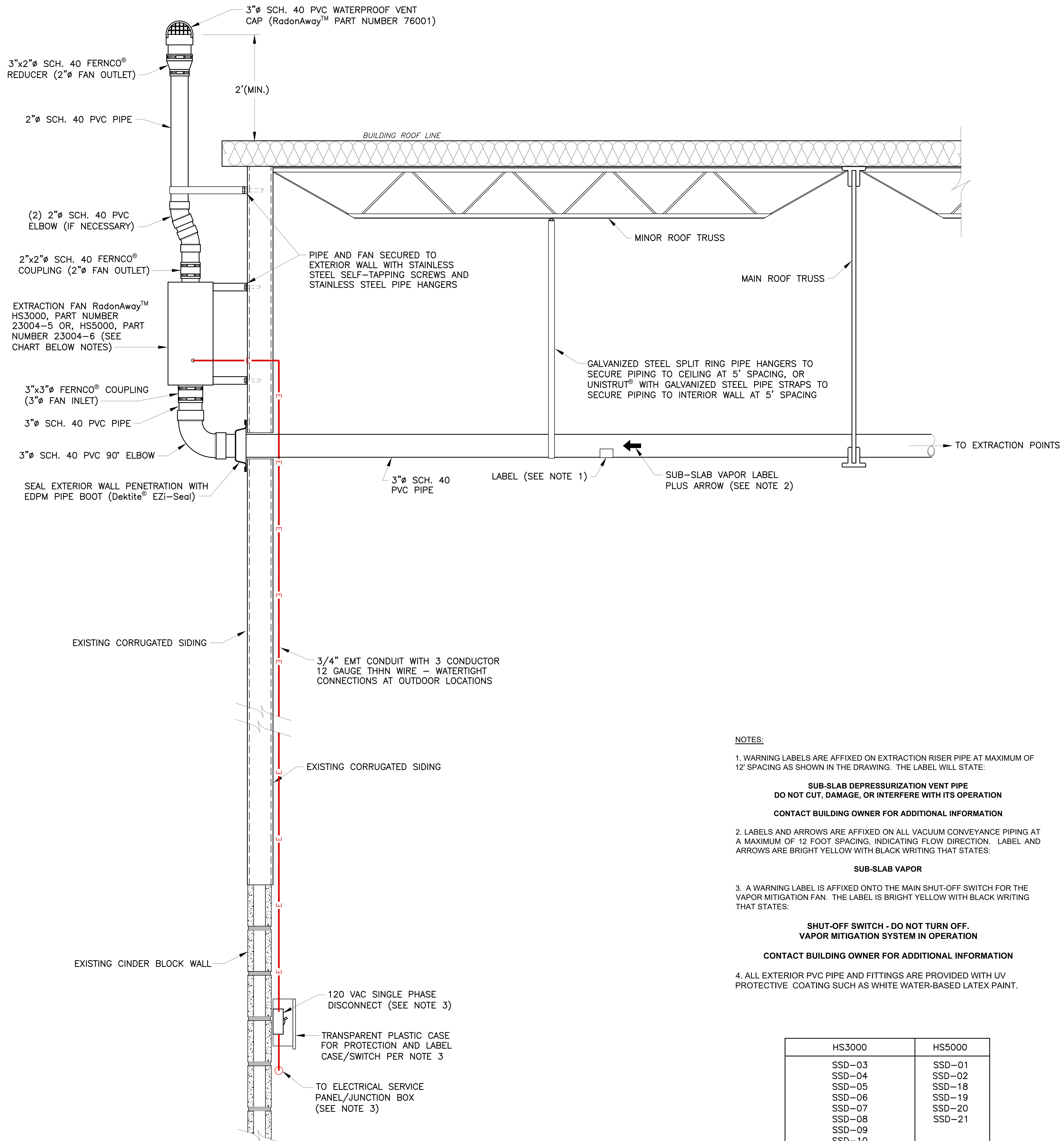
PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

WSP USA Inc.
7000 E. GENESEE ST. BLDG. D, 2ND FLOOR
FAYETTEVILLE, NY 13066
TEL: +1 315.655.3900

SHEET 2

Drawing Number
314P1545.018–D08

D



TYPICAL EXHAUST PIPING DETAIL

NOT TO SCALE

NOTES:

1. WARNING LABELS ARE AFFIXED ON EXTRACTION RISER PIPE AT MAXIMUM OF 12' SPACING AS SHOWN IN THE DRAWING. THE LABEL WILL STATE:

SUB-SLAB DEPRESSURIZATION VENT PIPE
DO NOT CUT, DAMAGE, OR INTERFERE WITH ITS OPERATION

CONTACT BUILDING OWNER FOR ADDITIONAL INFORMATION

2. LABELS AND ARROWS ARE AFFIXED ON ALL VACUUM CONVEYANCE PIPING AT A MAXIMUM OF 12 FOOT SPACING, INDICATING FLOW DIRECTION. LABEL AND ARROWS ARE BRIGHT YELLOW WITH BLACK WRITING THAT STATES:

SUB-SLAB VAPOR

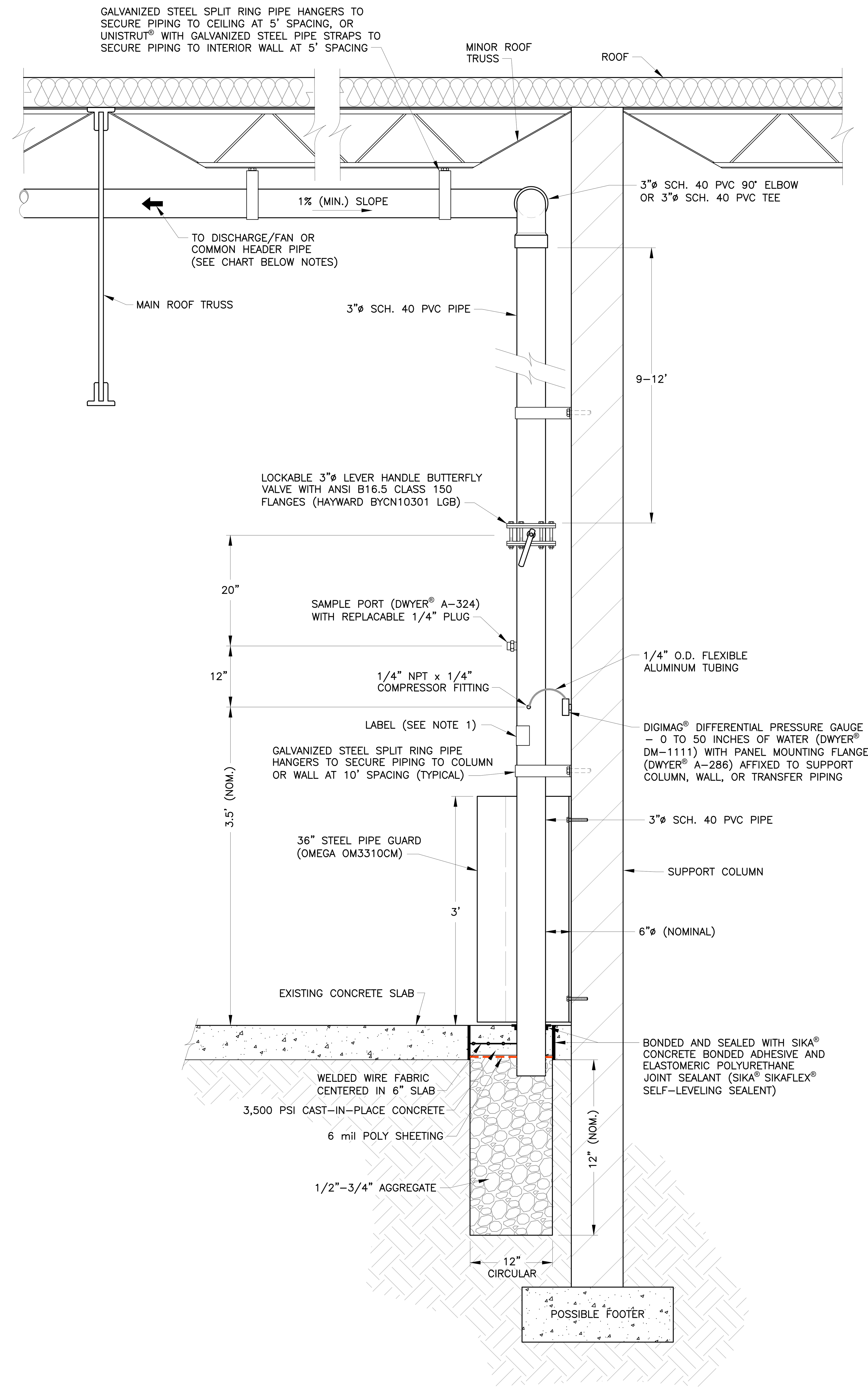
3. A WARNING LABEL IS AFFIXED ONTO THE MAIN SHUT-OFF SWITCH FOR THE VAPOR MITIGATION FAN. THE LABEL IS BRIGHT YELLOW WITH BLACK WRITING THAT STATES:

SHUT-OFF SWITCH - DO NOT TURN OFF.
VAPOR MITIGATION SYSTEM IN OPERATION

CONTACT BUILDING OWNER FOR ADDITIONAL INFORMATION

4. ALL EXTERIOR PVC PIPE AND FITTINGS ARE PROVIDED WITH UV PROTECTIVE COATING SUCH AS WHITE WATER-BASED LATEX PAINT.

HS3000	HS5000
SSD-03	SSD-01
SSD-04	SSD-02
SSD-05	SSD-18
SSD-06	SSD-19
SSD-07	SSD-20
SSD-08	SSD-21
SSD-09	
SSD-10	
SSD-11	
SSD-12	
SSD-13/SSD-15	
SSD-14/SSD-16	
SSD-17/SSD-22/SSD-23	



TYPICAL EXTRACTION POINT AND EXHAUST RISER INSTALLATION DETAIL

NOT TO SCALE

REVISIONS

REV	DESCRIPTION

DRAWN BY / CHECKED / APPROVED / SEAL / DATE

SSD SYSTEM CONSTRUCTION DETAILS

FORMER ROLLWAY BEARING FACILITY
LIVERPOOL, NEW YORK

PREPARED FOR
EMERSON
ST. LOUIS, MISSOURI

WSP USA Inc.
7000 E. GENESEE ST. BLDG D, 2ND FLOOR
FAYETTEVILLE, NY 13066
TEL: +1 315.655.3900

SHEET 3

Drawing Number
314P1545.018-D06

D