American Deli International, Inc.
(Former Restaurant & Title Loan Office)
Birmingham, Alabama
ADEM VCP Site #: 461-073-23007
Fact Sheet

A Voluntary Cleanup Program (VCP) Limited Sub-Slab Soil Gas Sampling Report has been found to be technically adequate by the Alabama Department of Environmental Management for the Former Restaurant & Title Loan Office site. American Deli International, Inc. currently owns the site located in Birmingham, Alabama. This fact sheet has been prepared to briefly advise the public of the principal legal and policy issues of the VCP.

I. VCP PROCESS

The VCP provides a mechanism for the implementation of a cleanup program that encourages applicants to voluntarily assess, remediate, and reuse rural and urban areas of actual or perceived contamination. The program does not relieve any "responsible person" of the liability for administrative, civil, or criminal fines or penalties which are otherwise authorized by law and imposed as a result of the illegal or unpermitted disposal of solid waste, hazardous waste, hazardous constituents, hazardous substances, petroleum products, and/or pollutants to the land, air, or waters of the State on an identified property. The program is designed to expedite the voluntary cleanup process and has been designed for entry at any stage of the cleanup process if all applicable criteria have been met up to the point of entry.

II. PROCEDURES FOR REACHING A FINAL DECISION

The Alabama Department of Environmental Management (ADEM) is proposing to issue American Deli International, Inc. a final decision for the site remediation.

ADEM Admin Code R. 335-15-6-.02 requires that the public be given a 30-day comment period from the date of the notice. The comment period will begin on May 3, 2023, which is the date of publication of the public notice in major local newspaper(s) of general circulation and will end on June 2, 2023.

All persons wishing to comment on any of the conditions of the VCP Remediation should submit their comments in writing to the Alabama Department of Environmental Management, Permits and Services Division, 1400 Coliseum Blvd. (Zip 36110). P.O. Box 301463 (Zip 36130-1463) Montgomery, Alabama, ATTENTION: Mr. Russell Kelly. Written comments on the VCP activities should be submitted to the Alabama Department of Environmental Management and be received by 5:00 p.m. on June 2, 2023.

ADEM will consider all written comments received during the comment period while making a final decision on this issue. When the Department makes its final decision,

notice will be given to the applicant and each person who has submitted written comments or requested notice of the final decision.

III. FACILITY DESIGN

NOVA Engineering and Environmental, LLC (NOVA) has completed Site Investigation activities under the VCP at the Former Restaurant & Title Loan Office site located at 9849 Parkway East, in Birmingham, Jefferson County, Alabama. The VCP site is approximately 0.52 acres and was previously occupied by multiple restaurants since development and a title loan office most recently. The site consists of one parcel. It consists of a single-story commercial building. The site is surrounded by automotive service facilities. Future use of the site is to remain commercial. Institutional and engineering controls will be used to eliminate or minimize potential exposure associated with the future use and/or development.

IV. TECHNICAL CONTACT

Chey-Anne Kilpatrick, Project Manager
Redevelopment Unit
Industrial Hazardous Waste Branch
Land Division
Alabama Department of Environmental Management
1400 Coliseum Boulevard (Zip 36110)
P.O. Box 301463 (Zip 36130-1463)
Montgomery, Alabama
(334) 279-3057

LIMITED SUB-SLAB SOIL GAS SAMPLING

FORMER RESTAURANT AND TITLE LOAN OFFICE

Birmingham, Alabama

SUBMITTED TO:

Alabama Department of Environmental Management
Land Division
Brownfield Redevelopment & Voluntary Cleanup Program
1400 Coliseum Boulevard
Montgomery, Alabama 36110

PREPARED FOR:

American Deli International Inc.
2716 Northeast Expressway
Atlanta, Georgia 30345

NOVA Project Number: 3022153.1
ADEM VCP Number: 461-073-23007

March 31, 2023

NOVA

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March 31, 2023

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
LAND DIVISION - BROWNFIELD REDEVELOPMENT AND VOLUNTARY CLEANUP PROGRAM
1400 Coliseum Boulevard
Montgomery, Alabama 36110

Attention: Ms. Chey-Anne C. Kilpatrick
Environmental Scientist – Land Division

Subject: Limited Sub-Slab Soil Gas Sampling
FORMER RESTAURANT AND TITLE LOAN OFFICE
Birmingham, Alabama
NOVA Project Number 3022153.1
ADEM VCP Number: 461-073-23007

Dear Ms. Kilpatrick:

NOVA Engineering and Environmental, LLC (NOVA) has completed the authorized Limited Sub-Slab Soil Gas Assessment for the approximately 0.52-acre property located at 9849 Parkway East in Birmingham, Jefferson County, Alabama. The work was performed in general accordance with NOVA Proposal Number 002-30237157, dated January 18, 2023.

The Limited Sub-Slab Soil Gas Sampling work was performed in general accordance with United States Environmental Protection Agency (US EPA) Office of Solid Waste and Emergency Response (OSWER) Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air dated June 2015 (OSWER Publication 9200.2-154) unless otherwise stated herein. The attached report presents our understanding of the project information, a description of the environmental consulting services provided by NOVA, and our findings and conclusions.

We appreciate your selection of NOVA and the opportunity to be of service on this project. If you have any questions, or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,
NOVA Engineering and Environmental, LLC

Nathan Parker
Project Geologist

Keith Rice
Senior Geologist

Copies Submitted: Addressee (electronic)

TABLE OF CONTENTS

1.0 INTRODUCTION

NOVA Engineering and Environmental, LLC (NOVA) was retained by American Deli International Inc. (Client) to perform Limited Sub-Slab Soil Gas Sampling at the Former Restaurant and Title Loan Office located at 9849 Parkway East in Birmingham, Jefferson County, Alabama (Subject Property). Figures are included in Appendix A.

1.1 LIMITATIONS

NOVA has performed a Limited Sub-Slab Soil Gas Sampling in general accordance with the United States Environmental Protection Agency (US EPA) Office of Solid Waste and Emergency Response (OSWER) Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air dated June 2015 (OSWER Publication 9200.2-154) which is a limited inquiry into a property's environmental status and is not sufficient to discover every potential source of environmental liability or environmental impact, if any, of the property to be evaluated. Performance of this Limited Sub-Slab Soil Gas Sampling is intended to reduce, but not eliminate, uncertainty regarding the potential for vapor migration in connection with a property, and this practice recognizes reasonable limits of time and cost.

The level of inquiry is variable. Not every property will warrant the same level of assessment. Consistent with good commercial or customary practices, the appropriate level of assessment will be guided by the type of property subject to assessment, the expertise and risk tolerance of American Deli International Inc. (Client), and the information developed in the course of the inquiry.

NOVA's assessment represents our professional opinion, only. Therefore, NOVA cannot, under any circumstances, make a statement of warranty or guarantee, expressed or implied, that Recognized Environmental Conditions (RECs), environmental impairment, or environmental impacts are limited to those that are discovered while we are performing the Limited Sub-Slab Soil Gas Sampling.

1.2 USER RELIANCE

NOVA's Limited Sub-Slab Soil Gas Sampling report, along with the findings and conclusions contained in the report, either in completed form, summary form, or by extraction, is prepared, and intended, for the sole use of the Client and therefore may not contain sufficient information for other purposes or parties. The Client is the only intended beneficiary of this report. The contents of NOVA's report will continue to be the property of NOVA. NOVA's report may not be disclosed to, used by, or relied upon by, any person or entity other than the Client without the express written consent of NOVA.

Authorization for disclosure to a third party or authorization for third-party reliance on a final report of any report will be considered by NOVA upon the written request of the Client. NOVA reserves the right to deny authorization to allow disclosure or reliance of NOVA's report to third parties.

1.3 SITE AND PROJECT INFORMATION

The Subject Property is located at 9849 Parkway East in Birmingham, Jefferson County, Alabama. According to the Jefferson County Geographic Information System (GIS) database, the Subject Property measures approximately 0.52-acres and contains one (1) tax parcel identified by Parcel Number 12 00 30 3 011 005.000. The GIS database indicates the Subject Property is currently developed with a one (1) story 1,980-square foot structure (circa 1984) and associated asphalt-paved parking areas. The Subject Property is bordered by Parkway East along the western property boundary.

NOVA conducted a Phase I Environmental Site Assessment (ESA) for the Subject Property (NOVA Project Number 3022153 dated August 31, 2022) that identified the following off-site issues resulting in Recognized Environmental Conditions (RECs) in connection with the Subject Property:

- A 12,000-gallon gasoline Underground Storage Tank (UST) at the Huffman District Office facility located on the south adjoining property.

- The Coats Keith auto shop facility located on the east adjoining property.

- The Wood Automotive facility located on the surrounding property south of the Subject Property.

Based on the results of the Phase I ESA, NOVA completed a Limited Phase II ESA (NOVA Project Number 3022153 dated October 4, 2022) for the Subject Property. The Limited Phase II ESA documented the completion of four (4) soil borings (N-1 through N-4). One (1) soil boring (N-4) was able to be extended below the groundwater table and was converted into a temporary groundwater monitoring well (TMW).

Soil sampling results indicated that Methylcyclohexane was present in one (1) soil sample (N-2-11.5') at a concentration of 0.0057 mg/kg. Methylcyclohexane does not have an established EPA Regional Screening Level (RSL). Additionally, Arsenic, Barium, Chromium, and Lead were detected at various concentrations in each of the soil samples collected. The concentrations of Arsenic were noted to exceed the EPAs Regional Screening Level (RSL).

Results from groundwater sample N-4-GW indicated the presence of Chloroform, Cis-1,2-Dichloroethene, Tetrachloroethene (PCE), and Trichloroethene (TCE). The concentration of PCE and TCE were noted to be above their respective EPA RSLs.

NOVA submitted a Brownfield Redevelopment and Voluntary Cleanup Program (VCP) Application (NOVA Project Number 3022153 dated December 8, 2022) to the Alabama Department of Environmental Management (ADEM) Land Division on behalf of Client. ADEM accepted the Subject Property into the Voluntary Cleanup Program and assigned VCP Number: 461-073-23007.

Based on a review of NOVAs Limited Phase II ESA, ADEM requested additional assessment to be conducted to assess if vapor intrusion is an issue in the onsite building in a letter dated January 12, 2023. NOVA submitted a Limited Sub-Slab Soil Gas Sampling Work Plan dated January 19, 2023 to ADEM. ADEM approved the Limited Sub-Slab Soil Gas Sampling Work Plan in a letter dated January 24, 2023.

2.0 SUB-SLAB SOIL GAS SAMPLING

Based on the results of NOVA's Limited Phase II ESA (NOVA Project Number 3022153 dated October 4, 2022) and ADEM's request in their letter dated January 12, 2023, NOVA performed Sub-Slab Soil Gas Sampling. Our assessment procedures, findings, conclusions, and recommendations are presented in the following sections.

2.1 SUB-SLAB SOIL GAS SAMPLING PROCEDURE

On January 27, 2023, NOVA provided oversight for the installation of three (3) sub slab soil gas sampling implants (SS-1 through SS-3) for the purpose of sampling sub-slab soil gas. The sub-slab implants were installed through the building slab using a masonry hammer drill and were advanced into soil approximately 3-4 inches below the bottom of the existing building slab.

Following the advancement of each soil gas sampling point, a length of 0.250-inch Interior Diameter (ID) flexible nylon tubing equipped with a particulate filter was inserted into the sampling point. The sub-slab sampling point was then filled with four (4) inches of industrial quartz sand. The remaining portion of the sampling points were filled with granular bentonite in three (3) inch increments and hydrated with water to create an airtight seal between the sampling point and the atmosphere.

Prior to sampling, each sample point was subjected to the following two (2) quality control tests:

- A Helium Leak Test, to confirm an airtight seal between the nylon tubing and the ground; and
- A Shut-in Test, to confirm an airtight seal in all components of the test apparatus.

After each sample point had passed the quality control tests within acceptable limits, the test apparatus and nylon tubing were purged of approximately three (3) volumes of air (approximately 180 cubic centimeters of air).

The soil gas samples were collected using 400 milliliter (mL) laboratory-provided summa canisters and shipped to H&P Mobile Geochemistry, Inc. (H&P) in Carlsbad, California. The three (3) soil gas samples were analyzed for the Volatile Organic Compound (VOC) Target Compound List (TCL) by United States Environmental Protection Agency (USEPA) Method TO-15.

2.2 QUALITY CONTROL AND QUALITY ASSURANCE METHODS

Field procedures and protocols used during the Limited Sub-Slab Soil Gas Assessment were performed in general accordance with those prescribed by the US EPA OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air dated June 2015 (OSWER Publication 9200.2-154).

Samples were labeled with a distinct sample identification number, the sampler's initials and the date of collection. Each sample container was properly sealed, labeled, and placed in appropriate storage containers for transport to an accredited laboratory (H&P) which used US EPA Method TO-15 protocols. A properly completed chain-of-custody forms were initiated in the field and accompanied the samples when submitted to the laboratories for analyses. Copies of the chain-of custody forms are shown in Appendix B.

3.0 SUB-SLAB GAS ANALYSIS RESULTS

The complete laboratory analytical report for soil gas samples SS-2 through SS-10 is included in Appendix B. The following VOC constituents were detected in the sub-slab soil gas samples collected at concentrations that exceeded the laboratory reporting limits:

	SS-1	SS-2	SS-3
Sample Collection Location / Compound	west interior	central interior	east interior
Benzene	BRL	BRL	3.8
Toluene	5.7	9.0	19
Tetrachloroethylene	23	150	330
m,p-Xylene	BRL	9.5	21
1,2,4-Trimethylbenzene	BRL	BRL	7.4

BRL – Below Laboratory Reporting Limit

* Results in micrograms per cubic meter ($\mu g/m^3$)

4.0 RISK ANALYSIS RESULTS

NOVA utilized the US EPA Vapor Intrusion Screening Level (VISL) Calculator and the highest concentrations of the VOC constituents detected to perform the following risk calculations. A copy of the output from the VISL Calculator is included in Appendix C.

4.1.1 Cumulative Cancer Risk

The following table details the calculated Cumulative Cancer Risks associated with the highest detected concentration of each VOC constituent:

	Highest Cumulative Cancer Risk (CR)
Alabama Recommended Cumulative Cancer Risk Limit	1.0E-06
Benzene	3.17E-07
Tetrachloroethylene	9.17E-07
Toluene	No IUR. CR Incalculable.
1,2,4-Trimethylbenzene	No IUR. CR Incalculable.
Total Xylenes	No IUR. CR Incalculable.
SUM Total	1.23E-06

IUR = Inhalation Unit Risk value. CR incalculable.
VISL = Vapor Intrusion Screening Level

Based on the risk calculations performed, the Cumulative Cancer Risk (CR) value for the highest detected concentration of each VOC constituent in samples SS-1 through SS-3 exceed the State of Alabama maximum recommended CR value of 1 in 1,000,000 (1.00E-06).

4.1.2 Cumulative Non-Cancer Hazard Quotient (HQ)

The following table details the calculated Cumulative Non-Cancer Hazard Quotients associated with the highest detected concentration of each VOC constituent:

	Highest Cumulative Non-Cancer Hazard Quotient (HQ)
Alabama Recommended Cumulative Non-Cancer Hazard Quotient (HQ)	0.1
Benzene	3.64E-03
Tetrachloroethylene	**2.37E-01**
Toluene	1.09E-04
1,2,4-Trimethylbenzene	3.55E-03
Total Xylenes	6.04E-03
SUM Total	**2.51E-01**

RfC = Reference Concentration value. HQ incalculable.
VISL = Vapor Intrusion Screening Level

Based on the risk calculations performed, the Cumulative Non-Cancer Hazard Quotients (HQ) for the highest detected concentration of each VOC constituent in samples SS-1 through SS-3 and the Individual Non-Cancer HQ for the highest detected concentration of Tetrachloroethylene (PCE) exceed the State of Alabama maximum recommended HQ of 0.1.

5.0 CONCLUSIONS

NOVA performed Limited Sub-Slab Soil Gas Sampling at the Former Restaurant and Title Loan Office located at 9849 Parkway East in Birmingham, Jefferson County, Alabama (Subject Property). The assessment was performed in a manner generally consistent with the United States Environmental Protection Agency (US EPA) Office of Solid Waste and Emergency Response (OSWER) Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air dated June 2015 (OSWER Publication 9200.2-154) and generally accepted industry standards.

VOC constituents detected in the sub-slab soil gas at the Subject Property were found to be at concentrations resulting in a Cumulative Cancer Risk (CR) value above the Alabama maximum recommended 1 in 1,000,000 (1.00E-06) and a Cumulative and Individual Non-Cancer Hazard Quotient (HQ) value above the Alabama maximum recommended 0.1 when calculated using the US EPA Vapor Intrusion Screening Level (VISL) Calculator.

Based on the results of this Limited Sub-Slab Soil Gas Sampling, NOVA concludes that a Vapor Intrusion Mitigation System (VIMS) is warranted for the Subject Property in the areas assessed.

NOVA recommends a chemically resistant, impervious epoxy coating such as EPRO Services, Inc.'s Geo-Seal EFC®, Land Science's Retro-Coat®, or equivalently effective product to be installed as a vapor barrier. The selected vapor barrier will be installed in general accordance with the manufacturer's specifications including, but not limited to, terminations, and sealing the system around penetrations. Generalized specifications of both EPRO Services, Inc.'s Geo-Seal EFC® and Land Science's Retro-Coat® are provided in Appendix D.

APPENDIX A

FIGURE

SUB-SLAB SOIL SAMPLING LOCATION PLAN

SOURCE: www.google.com
SCALE: As Shown

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AMERICAN DELI INTERNATIONAL INC.
9849 Parkway East
Birmingham, Jefferson County, Alabama
NOVA Project Number 10102-3022153

APPENDIX B

LABORATORY DATA REPORT

Mobile Geochemistry Inc.

07 February 2023

Jim Fineis
Total Vapor Solutions
120 Nottaway Lane
Alpharetta, GA 30009

H&P Project: TVS020123-10
Client Project: Nova Birmingham

Dear Jim Fineis:

Enclosed is the analytical report for the above referenced project. The data herein applies to samples as received by H&P Mobile Geochemistry, Inc. on 01-Feb-23 which were analyzed in accordance with the attached Chain of Custody record(s).

The results for all sample analyses and required QA/QC analyses are presented in the following sections and summarized in the documents:

- Sample Summary
- Case Narrative (if applicable)
- Sample Results
- Quality Control Summary
- Notes and Definitions / Appendix
- Chain of Custody
- Sampling Logs (if applicable)

Unless otherwise noted, I certify that all analyses were performed and reviewed in compliance with our Quality Systems Manual and Standard Operating Procedures. This report shall not be reproduced, except in full, without the written approval of H&P Mobile Geochemistry, Inc.

We at H&P Mobile Geochemistry, Inc. sincerely appreciate the opportunity to provide analytical services to you on this project. If you have any questions or concerns regarding this analytical report, please contact me at your convenience at 760-804-9678.

Sincerely,

Kristin Beckley for:
Lisa Eminhizer
Laboratory Director

H&P Mobile Geochemistry, Inc. is certified under the California ELAP and the National Environmental Laboratory Accreditation Conference (NELAC) for the fields of proficiency and analytes listed on those certificates. H& P is approved as an Environmental Testing Laboratory in accordance with the DoD-ELAP Program and ISO/IEC 17025:2005 programs for the fields of proficiency and analytes included in the certification process and to the extent offered by the accreditation agency . Unless otherwise noted, accreditation certificate numbers, expiration of certificates, and scope of accreditation can be found at: www.handpmg.com/about/certifications. Fields of services and analytes contained in this report that are not listed on the certificates should be considered uncertified or unavailable for certification.

H&P Mobile
Geochemistry Inc.

2470 Impala Drive
Carlsbad, CA 92010
760-804-9678 Phone
760-804-9159 Fax

Total Vapor Solutions	Project: TVS020123-10	
120 Nottaway Lane	Project Number: Nova Birmingham	Reported:
Alpharetta, GA 30009	Project Manager: Jim Fineis	07-Feb-23 13:15

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS-1	E302001-01	Vapor	27-Jan-23	01-Feb-23
SS-2	E302001-02	Vapor	27-Jan-23	01-Feb-23
SS-3	E302001-03	Vapor	27-Jan-23	01-Feb-23

H&P Mobile
Geochemistry Inc.

2470 Impala Drive
Carlsbad, CA 92010
760-804-9678 Phone
760-804-9159 Fax

Total Vapor Solutions	Project: TVS020123-10	
120 Nottaway Lane	Project Number: Nova Birmingham	Reported:
Alpharetta, GA 30009	Project Manager: Jim Fineis	07-Feb-23 13:15

DETECTIONS SUMMARY

Sample ID: **SS-1** Laboratory ID: **E302001-01**

Analyte	Result	Reporting Limit	Units	Method	Notes
Toluene	**5.7**	3.8	ug/m3	EPA TO-15	
Tetrachloroethene	**23**	6.9	ug/m3	EPA TO-15	

Sample ID: **SS-2** Laboratory ID: **E302001-02**

Analyte	Result	Reporting Limit	Units	Method	Notes
Toluene	**9.0**	3.8	ug/m3	EPA TO-15	
Tetrachloroethene	**150**	6.9	ug/m3	EPA TO-15	
m,p-Xylene	**9.5**	8.8	ug/m3	EPA TO-15	

Sample ID: **SS-3** Laboratory ID: **E302001-03**

Analyte	Result	Reporting Limit	Units	Method	Notes
Benzene	**3.8**	3.2	ug/m3	EPA TO-15	
Toluene	**19**	3.8	ug/m3	EPA TO-15	
Tetrachloroethene	**330**	6.9	ug/m3	EPA TO-15	
m,p-Xylene	**21**	8.8	ug/m3	EPA TO-15	
1,2,4-Trimethylbenzene	**7.4**	5.0	ug/m3	EPA TO-15	

H&P Mobile
Geochemistry Inc.

2470 Impala Drive
Carlsbad, CA 92010
760-804-9678 Phone
760-804-9159 Fax

Total Vapor Solutions	Project: TVS020123-10	
120 Nottaway Lane	Project Number: Nova Birmingham	Reported:
Alpharetta, GA 30009	Project Manager: Jim Fineis	07-Feb-23 13:15

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SS-1 (E302001-01) Vapor Sampled: 27-Jan-23 Received: 01-Feb-23									
Dichlorodifluoromethane (F12)	ND	5.0	ug/m3	1	EB30203	02-Feb-23	02-Feb-23	EPA TO-15	
Chloromethane	ND	2.1	"	"	"	"	"	"	
Dichlorotetrafluoroethane (F114)	ND	7.1	"	"	"	"	"	"	
Vinyl chloride	ND	2.6	"	"	"	"	"	"	
Bromomethane	ND	16	"	"	"	"	"	"	
Chloroethane	ND	8.0	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND	5.6	"	"	"	"	"	"	
1,1-Dichloroethene	ND	4.0	"	"	"	"	"	"	
1,1,2-Trichlorotrifluoroethane (F113)	ND	7.7	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND	3.5	"	"	"	"	"	"	
Carbon disulfide	ND	6.3	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	8.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	4.1	"	"	"	"	"	"	
2-Butanone (MEK)	ND	30	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	4.0	"	"	"	"	"	"	
Chloroform	ND	4.9	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.5	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	4.1	"	"	"	"	"	"	
Benzene	ND	3.2	"	"	"	"	"	"	
Carbon tetrachloride	ND	6.4	"	"	"	"	"	"	
Trichloroethene	ND	5.5	"	"	"	"	"	"	
1,2-Dichloropropane	ND	9.4	"	"	"	"	"	"	
Bromodichloromethane	ND	6.8	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	4.6	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND	8.3	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	4.6	"	"	"	"	"	"	
Toluene	**5.7**	3.8	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.5	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	8.3	"	"	"	"	"	"	
Dibromochloromethane	ND	8.6	"	"	"	"	"	"	
Tetrachloroethene	**23**	6.9	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	7.8	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	7.0	"	"	"	"	"	"	
Chlorobenzene	ND	4.7	"	"	"	"	"	"	
Ethylbenzene	ND	4.4	"	"	"	"	"	"	
m,p-Xylene	ND	8.8	"	"	"	"	"	"	
Styrene	ND	4.3	"	"	"	"	"	"	
o-Xylene	ND	4.4	"	"	"	"	"	"	

H&P Mobile
Geochemistry Inc.

2470 Impala Drive
Carlsbad, CA 92010
760-804-9678 Phone
760-804-9159 Fax

Total Vapor Solutions	Project: TVS020123-10	
120 Nottaway Lane	Project Number: Nova Birmingham	Reported:
Alpharetta, GA 30009	Project Manager: Jim Fineis	07-Feb-23 13:15

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SS-1 (E302001-01) Vapor Sampled: 27-Jan-23 Received: 01-Feb-23									
Bromoform	ND	10	ug/m3	1	EB30203	02-Feb-23	02-Feb-23	EPA TO-15	
1,1,2,2-Tetrachloroethane	ND	7.0	"	"	"	"	"	"	
4-Ethyltoluene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	12	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	12	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	12	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	38	"	"	"	"	"	"	
Hexachlorobutadiene	ND	54	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*90.2 %*		*76-134*	"	"	"	"	
Surrogate: Toluene-d8		*105 %*		*78-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*95.5 %*		*77-127*	"	"	"	"	
SS-2 (E302001-02) Vapor Sampled: 27-Jan-23 Received: 01-Feb-23									
Dichlorodifluoromethane (F12)	ND	5.0	ug/m3	1	EB30203	02-Feb-23	02-Feb-23	EPA TO-15	
Chloromethane	ND	2.1	"	"	"	"	"	"	
Dichlorotetrafluoroethane (F114)	ND	7.1	"	"	"	"	"	"	
Vinyl chloride	ND	2.6	"	"	"	"	"	"	
Bromomethane	ND	16	"	"	"	"	"	"	
Chloroethane	ND	8.0	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND	5.6	"	"	"	"	"	"	
1,1-Dichloroethene	ND	4.0	"	"	"	"	"	"	
1,1,2-Trichlorotrifluoroethane (F113)	ND	7.7	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND	3.5	"	"	"	"	"	"	
Carbon disulfide	ND	6.3	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	8.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	4.1	"	"	"	"	"	"	
2-Butanone (MEK)	ND	30	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	4.0	"	"	"	"	"	"	
Chloroform	ND	4.9	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.5	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	4.1	"	"	"	"	"	"	
Benzene	ND	3.2	"	"	"	"	"	"	
Carbon tetrachloride	ND	6.4	"	"	"	"	"	"	
Trichloroethene	ND	5.5	"	"	"	"	"	"	
1,2-Dichloropropane	ND	9.4	"	"	"	"	"	"	

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Total Vapor Solutions	Project: TVS020123-10	
120 Nottaway Lane	Project Number: Nova Birmingham	Reported:
Alpharetta, GA 30009	Project Manager: Jim Fineis	07-Feb-23 13:15

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SS-2 (E302001-02) Vapor Sampled: 27-Jan-23 Received: 01-Feb-23									
Bromodichloromethane	ND	6.8	ug/m3	1	EB30203	02-Feb-23	02-Feb-23	EPA TO-15	
cis-1,3-Dichloropropene	ND	4.6	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND	8.3	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	4.6	"	"	"	"	"	"	
Toluene	**9.0**	3.8	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.5	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	8.3	"	"	"	"	"	"	
Dibromochloromethane	ND	8.6	"	"	"	"	"	"	
Tetrachloroethene	**150**	6.9	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	7.8	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	7.0	"	"	"	"	"	"	
Chlorobenzene	ND	4.7	"	"	"	"	"	"	
Ethylbenzene	ND	4.4	"	"	"	"	"	"	
m,p-Xylene	**9.5**	8.8	"	"	"	"	"	"	
Styrene	ND	4.3	"	"	"	"	"	"	
o-Xylene	ND	4.4	"	"	"	"	"	"	
Bromoform	ND	10	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	7.0	"	"	"	"	"	"	
4-Ethyltoluene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	12	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	12	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	12	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	38	"	"	"	"	"	"	
Hexachlorobutadiene	ND	54	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*94.4 %*		*76-134*	"	"	"	"	
Surrogate: Toluene-d8		*116 %*		*78-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*92.8 %*		*77-127*	"	"	"	"	

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Total Vapor Solutions	Project: TVS020123-10	
120 Nottaway Lane	Project Number: Nova Birmingham	Reported:
Alpharetta, GA 30009	Project Manager: Jim Fineis	07-Feb-23 13:15

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SS-3 (E302001-03) Vapor Sampled: 27-Jan-23 Received: 01-Feb-23									
Dichlorodifluoromethane (F12)	ND	5.0	ug/m3	1	EB30203	02-Feb-23	02-Feb-23	EPA TO-15	
Chloromethane	ND	2.1	"	"	"	"	"	"	
Dichlorotetrafluoroethane (F114)	ND	7.1	"	"	"	"	"	"	
Vinyl chloride	ND	2.6	"	"	"	"	"	"	
Bromomethane	ND	16	"	"	"	"	"	"	
Chloroethane	ND	8.0	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND	5.6	"	"	"	"	"	"	
1,1-Dichloroethene	ND	4.0	"	"	"	"	"	"	
1,1,2-Trichlorotrifluoroethane (F113)	ND	7.7	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND	3.5	"	"	"	"	"	"	
Carbon disulfide	ND	6.3	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	8.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	4.1	"	"	"	"	"	"	
2-Butanone (MEK)	ND	30	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	4.0	"	"	"	"	"	"	
Chloroform	ND	4.9	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.5	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	4.1	"	"	"	"	"	"	
Benzene	**3.8**	3.2	"	"	"	"	"	"	
Carbon tetrachloride	ND	6.4	"	"	"	"	"	"	
Trichloroethene	ND	5.5	"	"	"	"	"	"	
1,2-Dichloropropane	ND	9.4	"	"	"	"	"	"	
Bromodichloromethane	ND	6.8	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	4.6	"	"	"	"	"	"	
4-Methyl-2-pentanone (MIBK)	ND	8.3	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	4.6	"	"	"	"	"	"	
Toluene	**19**	3.8	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.5	"	"	"	"	"	"	
2-Hexanone (MBK)	ND	8.3	"	"	"	"	"	"	
Dibromochloromethane	ND	8.6	"	"	"	"	"	"	
Tetrachloroethene	**330**	6.9	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	7.8	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	7.0	"	"	"	"	"	"	
Chlorobenzene	ND	4.7	"	"	"	"	"	"	
Ethylbenzene	ND	4.4	"	"	"	"	"	"	
m,p-Xylene	**21**	8.8	"	"	"	"	"	"	
Styrene	ND	4.3	"	"	"	"	"	"	
o-Xylene	ND	4.4	"	"	"	"	"	"	

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Total Vapor Solutions	Project: TVS020123-10	
120 Nottaway Lane	Project Number: Nova Birmingham	Reported:
Alpharetta, GA 30009	Project Manager: Jim Fineis	07-Feb-23 13:15

Volatile Organic Compounds by EPA TO-15

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SS-3 (E302001-03) Vapor Sampled: 27-Jan-23 Received: 01-Feb-23									
Bromoform	ND	10	ug/m3	1	EB30203	02-Feb-23	02-Feb-23	EPA TO-15	
1,1,2,2-Tetrachloroethane	ND	7.0	"	"	"	"	"	"	
4-Ethyltoluene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	**7.4**	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	12	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	12	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	12	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	38	"	"	"	"	"	"	
Hexachlorobutadiene	ND	54	"	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*96.6 %*		*76-134*	"	"	"	"	
Surrogate: Toluene-d8		*103 %*		*78-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*95.4 %*		*77-127*	"	"	"	"	

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Alpharetta, GA 30009	Project Manager: Jim Fineis	07-Feb-23 13:15

Volatile Organic Compounds by EPA TO-15 - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EB30203 - TO-15										
Blank (EB30203-BLK1)				Prepared & Analyzed: 02-Feb-23						
Dichlorodifluoromethane (F12)	ND	5.0	ug/m3							
Chloromethane	ND	2.1	"							
Dichlorotetrafluoroethane (F114)	ND	7.1	"							
Vinyl chloride	ND	2.6	"							
Bromomethane	ND	16	"							
Chloroethane	ND	8.0	"							
Trichlorofluoromethane (F11)	ND	5.6	"							
1,1-Dichloroethene	ND	4.0	"							
1,1,2-Trichlorotrifluoroethane (F113)	ND	7.7	"							
Methylene chloride (Dichloromethane)	ND	3.5	"							
Carbon disulfide	ND	6.3	"							
trans-1,2-Dichloroethene	ND	8.0	"							
1,1-Dichloroethane	ND	4.1	"							
2-Butanone (MEK)	ND	30	"							
cis-1,2-Dichloroethene	ND	4.0	"							
Chloroform	ND	4.9	"							
1,1,1-Trichloroethane	ND	5.5	"							
1,2-Dichloroethane (EDC)	ND	4.1	"							
Benzene	ND	3.2	"							
Carbon tetrachloride	ND	6.4	"							
Trichloroethene	ND	5.5	"							
1,2-Dichloropropane	ND	9.4	"							
Bromodichloromethane	ND	6.8	"							
cis-1,3-Dichloropropene	ND	4.6	"							
4-Methyl-2-pentanone (MIBK)	ND	8.3	"							
trans-1,3-Dichloropropene	ND	4.6	"							
Toluene	ND	3.8	"							
1,1,2-Trichloroethane	ND	5.5	"							
2-Hexanone (MBK)	ND	8.3	"							
Dibromochloromethane	ND	8.6	"							
Tetrachloroethene	ND	6.9	"							
1,2-Dibromoethane (EDB)	ND	7.8	"							
1,1,1,2-Tetrachloroethane	ND	7.0	"							
Chlorobenzene	ND	4.7	"							

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120 Nottaway Lane	Project Number: Nova Birmingham	Reported:
Alpharetta, GA 30009	Project Manager: Jim Fineis	07-Feb-23 13:15

Volatile Organic Compounds by EPA TO-15 - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EB30203 - TO-15										
Blank (EB30203-BLK1)				Prepared & Analyzed: 02-Feb-23						
Ethylbenzene	ND	4.4	ug/m3							
m,p-Xylene	ND	8.8	"							
Styrene	ND	4.3	"							
o-Xylene	ND	4.4	"							
Bromoform	ND	10	"							
1,1,2,2-Tetrachloroethane	ND	7.0	"							
4-Ethyltoluene	ND	5.0	"							
1,3,5-Trimethylbenzene	ND	5.0	"							
1,2,4-Trimethylbenzene	ND	5.0	"							
1,3-Dichlorobenzene	ND	12	"							
1,4-Dichlorobenzene	ND	12	"							
1,2-Dichlorobenzene	ND	12	"							
1,2,4-Trichlorobenzene	ND	38	"							
Hexachlorobutadiene	ND	54	"							
Surrogate: 1,2-Dichloroethane-d4	*206*		*"*	*214*		*96.6*	*76-134*			
Surrogate: Toluene-d8	*251*		*"*	*208*		*121*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*328*		*"*	*363*		*90.4*	*77-127*			
LCS (EB30203-BS1)				Prepared & Analyzed: 02-Feb-23						
Dichlorodifluoromethane (F12)	100	5.0	ug/m3	101		103	59-128			
Vinyl chloride	52	2.6	"	52.0		99.5	64-127			
Chloroethane	54	8.0	"	53.6		101	63-127			
Trichlorofluoromethane (F11)	110	5.6	"	113		100	62-126			
1,1-Dichloroethene	79	4.0	"	80.8		98.0	61-133			
1,1,2-Trichlorotrifluoroethane (F113)	100	7.7	"	155		67.7	66-126			
Methylene chloride (Dichloromethane)	72	3.5	"	70.8		101	62-115			
trans-1,2-Dichloroethene	72	8.0	"	80.8		88.7	67-124			
1,1-Dichloroethane	77	4.1	"	82.4		93.8	68-126			
cis-1,2-Dichloroethene	72	4.0	"	80.0		89.6	70-121			
Chloroform	98	4.9	"	99.2		98.4	68-123			
1,1,1-Trichloroethane	110	5.5	"	111		95.3	68-125			
1,2-Dichloroethane (EDC)	76	4.1	"	82.4		91.7	65-128			
Benzene	61	3.2	"	64.8		93.9	69-119			

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120 Nottaway Lane	Project Number: Nova Birmingham	Reported:
Alpharetta, GA 30009	Project Manager: Jim Fineis	07-Feb-23 13:15

Volatile Organic Compounds by EPA TO-15 - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EB30203 - TO-15										
LCS (EB30203-BS1)				Prepared & Analyzed: 02-Feb-23						
Carbon tetrachloride	120	6.4	ug/m3	128		93.9	68-132			
Trichloroethene	100	5.5	"	110		94.8	71-123			
Toluene	71	3.8	"	76.8		92.6	66-119			
1,1,2-Trichloroethane	98	5.5	"	111		88.5	73-119			
Tetrachloroethene	130	6.9	"	138		90.8	66-124			
1,1,1,2-Tetrachloroethane	130	7.0	"	140		90.2	67-129			
Ethylbenzene	88	4.4	"	88.4		99.3	70-124			
m,p-Xylene	87	8.8	"	88.4		98.8	61-134			
o-Xylene	89	4.4	"	88.4		100	67-125			
1,1,2,2-Tetrachloroethane	130	7.0	"	140		95.0	65-127			
Surrogate: 1,2-Dichloroethane-d4	*206*		*"*	*214*		*96.5*	*76-134*			
Surrogate: Toluene-d8	*226*		*"*	*208*		*109*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*340*		*"*	*363*		*93.7*	*77-127*			
LCS Dup (EB30203-BSD1)				Prepared & Analyzed: 02-Feb-23						
Dichlorodifluoromethane (F12)	110	5.0	ug/m3	101		106	59-128	2.19	25	
Vinyl chloride	54	2.6	"	52.0		103	64-127	3.74	25	
Chloroethane	55	8.0	"	53.6		102	63-127	0.979	25	
Trichlorofluoromethane (F11)	110	5.6	"	113		97.7	62-126	2.47	25	
1,1-Dichloroethene	80	4.0	"	80.8		99.6	61-133	1.56	25	
1,1,2-Trichlorotrifluoroethane (F113)	170	7.7	"	155		107	66-126	44.9	25	QR-02
Methylene chloride (Dichloromethane)	75	3.5	"	70.8		106	62-115	5.00	25	
trans-1,2-Dichloroethene	71	8.0	"	80.8		87.5	67-124	1.36	25	
1,1-Dichloroethane	76	4.1	"	82.4		91.9	68-126	1.99	25	
cis-1,2-Dichloroethene	73	4.0	"	80.0		91.2	70-121	1.78	25	
Chloroform	95	4.9	"	99.2		95.3	68-123	3.13	25	
1,1,1-Trichloroethane	100	5.5	"	111		93.7	68-125	1.73	25	
1,2-Dichloroethane (EDC)	78	4.1	"	82.4		94.2	65-128	2.73	25	
Benzene	60	3.2	"	64.8		92.9	69-119	1.07	25	
Carbon tetrachloride	120	6.4	"	128		92.8	68-132	1.18	25	
Trichloroethene	110	5.5	"	110		96.2	71-123	1.46	25	
Toluene	73	3.8	"	76.8		94.8	66-119	2.33	25	
1,1,2-Trichloroethane	100	5.5	"	111		91.9	73-119	3.74	25	

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120 Nottaway Lane	Project Number: Nova Birmingham	Reported:
Alpharetta, GA 30009	Project Manager: Jim Fineis	07-Feb-23 13:15

Volatile Organic Compounds by EPA TO-15 - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EB30203 - TO-15										
LCS Dup (EB30203-BSD1)				Prepared & Analyzed: 02-Feb-23						
Tetrachloroethene	130	6.9	ug/m3	138		93.2	66-124	2.60	25	
1,1,1,2-Tetrachloroethane	120	7.0	"	140		85.9	67-129	4.86	25	
Ethylbenzene	87	4.4	"	88.4		99.0	70-124	0.351	25	
m,p-Xylene	89	8.8	"	88.4		101	61-134	2.09	25	
o-Xylene	91	4.4	"	88.4		103	67-125	2.40	25	
1,1,2,2-Tetrachloroethane	140	7.0	"	140		98.6	65-127	3.70	25	
Surrogate: 1,2-Dichloroethane-d4	*201*		*"*	*214*		*94.3*	*76-134*			
Surrogate: Toluene-d8	*241*		*"*	*208*		*116*	*78-125*			
Surrogate: 4-Bromofluorobenzene	*347*		*"*	*363*		*95.5*	*77-127*			

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120 Nottaway Lane	Project Number: Nova Birmingham	Reported:
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Notes and Definitions

QR-02	The RPD result exceeded the QC control limits. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
LCC	Leak Check Compound
ND	Analyte NOT DETECTED at or above the reporting limit
MDL	Method Detection Limit
%REC	Percent Recovery
RPD	Relative Percent Difference

All soil results are reported in wet weight.

Appendix

H&P Mobile Geochemistry, Inc. is approved as an Environmental Testing Laboratory and Mobile Laboratory in accordance with the DoD-ELAP Program and ISO/IEC 17025:2005 programs through PJLA, accreditation number 69070 for EPA Method TO-15, EPA Method 8260B and H&P 8260SV.

H&P is approved by the State of California as an Environmental Laboratory and Mobile Laboratory in conformance with the Environmental Laboratory Accreditation Program (ELAP) for the category of Volatile and Semi-Volatile Organic Chemistry of Hazardous Waste, certification numbers 2740, 2741, 2743 & 2745.

H&P is approved by the State of Louisiana Department of Environmental Quality under the National Environmental Laboratory Accreditation Conference (NELAC) certification number 04138

The complete list of stationary and mobile laboratory certifications along with the fields of testing (FOTs) and analyte lists are available at www.handpmg.com/about/certifications.

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VAPOR / AIR Chain of Custody

DATE: 2/1/23
Page 1 of ____

Lab Client and Project Information

Lab Client/Consultant:	Total Vapor Solutions	Project Name / #:	~~[illegible]~~ Nova-Birmingham
Lab Client Project Manager:	Jim Fineis	Project Location:	Birmingham, AL
Lab Client Address:	120 Nottaway Lane	Report E-Mail(s):	jim@totalvaporsolutions.com
Lab Client City, State, Zip:	Alpharetta, GA 30009		
Phone Number:	770-883-3372		

Reporting Requirements
- [x] Standard Report ☐ Level III ☐ Level IV
- [x] Excel EDD ☐ Other EDD: _____
- ☐ CA Geotracker Global ID: _____

Turnaround Time
- ☐ **Standard** (7 days for preliminary report, 10 days for final report)
- ☐ **Rush** (specify): _____

Sampler Information
Sampler(s): Jim Fineis
Signature: [signature]
Date: 1.30.23

Sample Receipt (Lab Use Only)
Date Rec'd: 2/1/23 Control #: 230050-01
H&P Project # TVS020123-10
Lab Work Order #
Sample Intact: [x] Yes ☐ No ☐ See Notes Below
Receipt Gauge ID: 60206 Temp: RT
Outside Lab:
Receipt Notes/Tracking #: FedEx 7711 6616 8790 60
Lab PM Initials: SN

Additional Instructions to Laboratory: 5th day TAT

* *Preferred VOC units (please choose one):*
☐ µg/L [x] µg/m³ ☐ ppbv ☐ ppmv

SAMPLE NAME	FIELD POINT NAME (if applicable)	DATE mm/dd/yy	TIME 24hr clock	SAMPLE TYPE Indoor Air (IA), Ambient Air (AA), Subslab (SS), Soil Vapor (SV)	CONTAINER SIZE & TYPE 400mL/1L/6L Summa, Tedlar, Tube, etc.	CONTAINER ID (###)	Lab use only: Receipt Vac	VOCs Standard Full List ☐ 8260SV [x] TO-15	VOCs Short List / Project List ☐ 8260SV ☐ TO-15	Oxygenates ☐ 8260SV ☐ TO-15	Naphthalene ☐ 8260SV ☐ TO-15	TPHv as Gas ☐ 8260SVm ☐ TO-15m	Aromatic/Aliphatic Fractions ☐ 8260SVm ☐ TO-15m	Leak Check Compound ☐ DFA ☐ IPA ☐ He	Methane by EPA 8015m	Fixed Gases by ASTM D1945 ☐ CO2 ☐ O2 ☐ N2
55-1	355	1.27.23	~~1140~~ 1140	55	400	200	5.74	[x]								
55-2	370	↓	1148	↓	↓ 370	~~300~~	0.64	[x]								
55-3	349	↓	1157	↓	349	~~169~~	5.96	[x]								

Approved/Relinquished by: [signature]	Company: TVS	Date: ~~1.30.23~~ 1.30.23	Time:	Received by: FedEx	Company:	Date:	Time:
Approved/Relinquished by:	Company:	Date:	Time:	Received by: [signature]	Company: H&P	Date: 2/1/23	Time: 1235
Approved/Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:

*Approval constitutes as authorization to proceed with analysis and acceptance of conditions on back

APPENDIX C

VISL CALCULATOR OUTPUT

Resident Air Inputs

Variable	Resident Air Default Value	Site-Specific Value
AF_{gw} (Attenuation Factor Groundwater) unitless	0.001	0.001
AF_{ss} (Attenuation Factor Sub-Slab) unitless	0.03	0.03
ED_{res} (exposure duration) years	26	26
ED_{0-2} (mutagenic exposure duration first phase) years	2	2
ED_{2-6} (mutagenic exposure duration second phase) years	4	4
ED_{6-16} (mutagenic exposure duration third phase) years	10	10
ED_{16-26} (mutagenic exposure duration fourth phase) years	10	10
EF_{res} (exposure frequency) days/year	350	350
EF_{0-2} (mutagenic exposure frequency first phase) days/year	350	350
EF_{2-6} (mutagenic exposure frequency second phase) days/year	350	350
EF_{6-16} (mutagenic exposure frequency third phase) days/year	350	350
EF_{16-26} (mutagenic exposure frequency fourth phase) days/year	350	350
ET_{res} (exposure time) hours/day	24	24
ET_{0-2} (mutagenic exposure time first phase) hours/day	24	24
ET_{2-6} (mutagenic exposure time second phase) hours/day	24	24
ET_{6-16} (mutagenic exposure time third phase) hours/day	24	24
ET_{16-26} (mutagenic exposure time fourth phase) hours/day	24	24
THQ (target hazard quotient) unitless	0.1	0.1
LT (lifetime) years	70	70
TR (target risk) unitless	1.0E-06	1.0E-06

Resident Vapor Intrusion Screening Levels (VISL)

Key: I = IRIS; P = PPRTV; O = OPP; A = ATSDR; C = Cal EPA; X = PPRTV Screening Level; H = HEAST; D = DWSHA; W = TEF applied; E = RPF applied; U = user provided; G = see RSL User's Guide Section 5; CA = cancer; NC = noncancer.

Chemical	CAS Number	Does the chemical meet the definition for volatility? (HLC>1E-5 or VP>1)	Does the chemical have inhalation toxicity data? (IUR and/or RfC)	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Soil Source? ($C_{vp} > C_{i,a}$,Target?)	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Groundwater Source? ($C_{hc} > C_{i,a}$,Target?)	Target Indoor Air Concentration (TCR=1E-06 or THQ=0.1) MIN($C_{ia,c}$,$C_{ia,nc}$) ($\mu g/m^3$)	Toxicity Basis	Target Sub-Slab and Near-source Soil Gas Concentration (TCR=1E-06 or THQ=0.1) C_{sg},Target ($\mu g/m^3$)	Target Groundwater Concentration (TCR=1E-06 or THQ=0.1) C_{gw},Target ($\mu g/L$)
Benzene	71-43-2	Yes	Yes	Yes	Yes	3.60E-01	CA	1.20E+01	1.59E+00
Tetrachloroethylene	127-18-4	Yes	Yes	Yes	Yes	4.17E+00	NC	1.39E+02	5.76E+00
Toluene	108-88-3	Yes	Yes	Yes	Yes	5.21E+02	NC	1.74E+04	1.92E+03
Trimethylbenzene, 1,2,4-	95-63-6	Yes	Yes	Yes	Yes	6.26E+00	NC	2.09E+02	2.48E+01
Xylenes	1330-20-7	Yes	Yes	Yes	Yes	1.04E+01	NC	3.48E+02	3.85E+01

Is Target Groundwater Concentration < MCL? (C_{gw} < MCL?)	Pure Phase Vapor Concentration C_{vp}\ (25 °C)\ ($\mu g/m^3$)	Maximum Groundwater Vapor Concentration C_{hc}\ ($\mu g/m^3$)	Temperature for Maximum Groundwater Vapor Concentration (°C)	Lower Explosive Limit LEL (% by volume)	LEL Ref	IUR (ug/m^3)$^{-1}$	IUR Ref	RfC (mg/m^3)	RfC Ref	Mutagenic Indicator	Carcinogenic VISL TCR=1E-06 $C_{ia,c}$ ($\mu g/m^3$)	Noncarcinogenic VISL THQ=0.1 $C_{ia,nc}$ ($\mu g/m^3$)
Yes (5)	3.98E+08	4.06E+08	25	1.20	U	7.80E-06	U	3.00E-02	U	No	3.60E-01	3.13E+00
No (5)	1.65E+08	1.49E+08	25	-		2.60E-07	U	4.00E-02	U	No	1.08E+01	4.17E+00
No (1000)	1.41E+08	1.43E+08	25	1.10	U	-		5.00E+00	U	No	-	5.21E+02
--	1.36E+07	1.44E+07	25	0.90	U	-		6.00E-02	U	No	-	6.26E+00
Yes (10000)	4.56E+07	2.87E+07	25	-		-		1.00E-01	U	No	-	1.04E+01

Resident Vapor Intrusion Risk

Chemical	CAS Number	Site Sub-Slab and Exterior Soil Gas Concentration C_{sg} \ ($\mu g/m^3$)	Site Indoor Air Concentration $C_{i,a}$ \ ($\mu g/m^3$)	VI Carcinogenic Risk CDI ($\mu g/m^3$)	VI Carcinogenic Risk CR	VI Hazard CDI (mg/m^3)	VI Hazard HQ	IUR $(ug/m^3)^{-1}$	IUR Ref
Benzene	71-43-2	3.8	1.14E-01	4.06E-02	3.17E-07	1.09E-04	3.64E-03	7.80E-06	U
Tetrachloroethylene	127-18-4	330	9.90E+00	3.53E+00	9.17E-07	9.49E-03	2.37E-01	2.60E-07	U
Toluene	108-88-3	19	5.70E-01	2.03E-01	-	5.47E-04	1.09E-04	-	
Trimethylbenzene, 1,2,4-	95-63-6	7.4	2.22E-01	7.91E-02	-	2.13E-04	3.55E-03	-	
Xylenes	1330-20-7	21	6.30E-01	2.24E-01	-	6.04E-04	6.04E-03	-	
*Sum		-	-	-	1.23E-06	-	2.51E-01	-	

Chronic RfC (mg/m^3)	RfC Ref	Temperature (℃)\ for Groundwater Vapor Concentration	Mutagen?
3.00E-02	U	25	No
4.00E-02	U	25	No
5.00E+00	U	25	No
6.00E-02	U	25	No
1.00E-01	U	25	No
-		-	

Chemical Properties

Chemical	CAS Number	Does the chemical meet the definition for volatility? (HLC>1E-5 or VP>1)	Does the chemical have inhalation toxicity data? (IUR and/or RfC)	MW	MW Ref	Vapor Pressure VP (mm Hg)	VP Ref	S (mg/L)	S Ref	MCL (ug/L)
Benzene	71-43-2	Yes	Yes	78.12	U	9.48E+01	U	1.79E+03	U	5
Tetrachloroethylene	127-18-4	Yes	Yes	165.83	U	1.85E+01	U	2.06E+02	U	5
Toluene	108-88-3	Yes	Yes	92.14	U	2.84E+01	U	5.26E+02	U	1000
Trimethylbenzene, 1,2,4-	95-63-6	Yes	Yes	120.20	U	2.10E+00	U	5.70E+01	U	-
Xylenes	1330-20-7	Yes	Yes	106.17	U	7.99E+00	U	1.06E+02	U	10000

HLC (atm-m ^{3}/mole)	Henry's Law Constant (unitless)	H` and HLC Ref	Henry's Law Constant Used in Calcs (unitless)	Normal Boiling Point BP (K)	BP Ref	Critical Temperature T_C\ (K)	T_C\ Ref	Enthalpy of vaporization at the normal boiling point $\Delta H_{v,b}$\ (cal/mol)	$\Delta H_{v,b}$\ Ref	Lower Explosive Limit LEL (% by volume)	LEL Ref
5.55E-03	2.27E-01	U	2.27E-01	353.15	U	5.62E+02	U	7340.00	U	1.20	U
1.77E-02	7.24E-01	U	7.24E-01	394.15	U	6.20E+02	U	8290.00	U	-	
6.64E-03	2.71E-01	U	2.71E-01	384.15	U	5.92E+02	U	7930.00	U	1.10	U
6.16E-03	2.52E-01	U	2.52E-01	442.15	U	6.49E+02	U	9370.00	U	0.90	U
6.63E-03	2.71E-01	U	2.71E-01	411.15	U	6.20E+02	U	8520.00	U	-	

APPENDIX D

GEO-SEAL EFC® AND RETRO-COAT® GENERAL SPECIFICATIONS

Geo-Seal EFC

Product Description

Basic Use: Geo-Seal EFC is a highly chemically resistant, impervious epoxy coating specially formulated to protect existing structures from contaminant vapor intrusion without the need for additional concrete protection. Geo-Seal EFC is resistant to both PCE, TCE, and other organic solvents commonly found in contaminated soils. Applied as the key component of ERPO's Geo-Seal EFC coating system, Geo-Seal EFC can be combined with various functional topcoat materials to create an abrasion-resistant wearing surface or any desired aesthetic appearance; this optional enhancement ensures Geo-Seal EFC can meet the performance needs of any project. Most commonly applied to horizontal concrete substrates, various functional primers part of the Geo-Seal EFC system can be utilized for various substrate conditions common in existing structures, including oil saturated concrete and substrates with high moisture content and high moisture vapor drive.

Composition: Geo-Seal EFC is a plural component, zero VOC, 100% solids, low odor, medium viscosity, highly chemically resistant impermeable epoxy coating.

Benefits

- Virtually eliminates chemical vapor intrusion through concrete without the need for additional concrete protection or removal of the concrete slab.
- Specially formulated to provide superior chemical resistance to soil contaminates including TCE, PCE and petroleum hydrocarbons.
- Reduces overall remediation costs while providing multiple options for surface finishes including cast aggregate or floor coverings.
- Low odor and fast cure times reduce the application impact on existing buildings.
- Zero VOCs, 100% solids, USDA and FDA approved.

Limitations

- Material should be stored above 40°F and not allowed to freeze.
- Ambiant application temperature range is recommended between 40°F and 90°F.
- Cold temperatures will prolong cure time and high temperatures will result in shortened working times.
- Proper substrate preparation including the use of certain primers and concrete surface repair must be employed in accordance with the manufacturer's application guidelines.

Technical Data

Shelf life: 1 year when maintained between a 40°F and 80°F.

Properties: See physical properties table

Specification Writer: Contact EPRO before writing specifications on this product. Geo-Seal system assemblies should be reviewed in order to meet project specific site conditions.

Installation

Surface Preparation: All surfaces shall be prepared in accordance with manufacturer's specifications and ICRI Guideline No. 310.2R Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair. Apply the appropriate primer based on the specific conditions of the substrate following that primer's application guidelines. See EPRO's Technical Bulletin: Selecting a Primer.

Application: Please refer to manufacturer's specifications. Mix at lowest RPM setting. Geo-Seal EFC is applied at a rate of 80 square feet per gallon to a total applied thickness of 20 mils.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Geo-Seal EFC is available in 1 gal. a 5 gal. kits.

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

Geo-Seal EFC

Equipment

Disposable brushs, variable low speed drill with impeller mixing paddle, non-shedding phenolic core rollers, and V-notched rubber squeegees and/or guage rake and trowels.

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

Typical Physical Properties

Physical Property	Test Method	Value
Color		Standard and custom colors
VOC Content		0 gr./lt.
Shelf Life		1 year
Viscosity at 77°F		1000-2000 cps
Viscosity at 60°F		2200-4000 cps
Compressive Strength	ASTM D695	14,500 PSI (16,500 PSI with aggregate)
Flexular Strength	ASTM D790	19,200
Tensile Elongation	ASTM D638	1.0%
Abrasion Resistance	ASTM D1044	20-25 mg.
Bond Strength	ACI 503	>350 psi 100% concrete failure
Hardness (Shore D)	ASTM D 2240	89-93
Impact Resistance	ASTM D 2794	160 in./lbs.
Freeze Thaw Resistance	ASTM C666	300 cycles pass

Packaging: 1 gallon and 5 gallon kits.

Mix Ratio by Volume: 2:1
Mix Ratio by Weight: 2.16:1 (lbs.)
Minimum Substrate Application Temprature: 40°F
Pot Life at 77°F: 15 min.
Dry to Touch (50°F-90°F): 7 to 12 hours
Recoat Time (77°F): 7 to 8 hours
Recoat Time (60°F): 10 to 12 hours
Light Foot Traffic (50°F-90°F): 7 to 12 hours

Geo-Seal EFC Primer

Product Description

Basic Use: Geo-Seal EFC Primer is a high performance 2-component 100% solids, concrete penetrating epoxy primer. As a component to the Geo-Seal EFC system, it is designed to bond to properly prepared concrete substrates including substrates that may have been contaminated by common concrete surface hardeners or curing agents. Geo-Seal EFC Primer contains no migratory plasticizers, phenols or unreacted amines which often leads to adhesion problems, especially when concrete moisture problems exist.

Composition: Geo-Seal EFC Primer is a plural component, low VOC, water based, low viscosity epoxy primer.

Benefits

- Complies with USDA and FDA requirements.
- VOC and EPA Compliant in all states and provinces in North America. Cures to an inert finish.
- Penetrates into concrete substrates and exhibits excellent adhesive properties.
- Excellent chemical resistance.
- Designed for new concrete substrates and for resurfacing existing substrates.

Limitations

- This product is best suited for applications in temperatures between 60°F to 90°F. Do not apply when relative humidity exceeds 85%.
- Higher temperatures will result in shortened working time and faster drying time.
- Substrate must be dry.

Technical Data

Shelf life: 1 year maintained between a 40°F and 100°F.

Properties: See physical properties table

Specification Writer: Contact EPRO before writing specifications on this product. E.Series system assemblies should be reviewed in order to meet project specific site conditions.

Installation

Surface Preparation: All surfaces shall be prepared in accordance with manufacturer's specifications and ICRI Guideline No. 310.2R Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair. The pH of the concrete substrate should be at 9 or above. All materials that may inhibit bonding must be removed. A test area should always be done prior to application using the same cleaning preparation and application procedures to be used on the project.

Application: Please refer to manufacturer's specifications. Mix at lowest RPM setting. Geo-Seal EFC Primer is applied to a wet film thickness of 8 mils at a rate of approximately 200 SF per gallon.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Geo-Seal EFC Primer is available in 3 gal. and 15 gal. kits.

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

Geo-Seal EFC Primer

Equipment

Disposable brushes, variable low speed drill with impeller mixing paddle, 3/8" non-shedding phenolic core rollers, roller frame and V-notched rubber squeegees.

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

Typical Physical Properties

Physical Property	Test Method	Value
Color		Straw
VOC Content		< 2 gr./lt.
Shelf Life		1 year
Viscosity at 77°F		500-700 cps
Viscosity at 60°F		1300-1600 cps
Hardness, Shore D	ASTM D2240	78-80
Bond Strength	ACI 503	>350
Impact Resistance	ASTM D2794	160 in./lbs.
Abrasion Resistance	ASTM D1044	45-50 mg.
Compressive Strength	ASTM D695	7,800 PSI
Flexural Strength	ASTM D790	10,360
Tensile Elongation	ASTM D638	6.5%
Tensile Strength	ASTM D638	6,790
Freeze Thaw Resistance	ASTM C666	300 cycles pass

Packaging: 3 gallon and 15 gallon kits.

Mix Ratio by Volume: 2:1
Mix Ratio by Weight: 2.24:1 (lbs.)
Minimum Substrate Application Temperature: 40°F
Pot Life at 77°F: 15 min.
Dry to Touch (50°F-90°F): 7 to 12 hours
Recoat Time (77°F): 7 to 8 hours
Recoat Time (60°F): 10 to 12 hours
Light Foot Traffic (50°F-90°F): 7 to 12 hours

Geo-Seal EFC Gel

Product Description

Basic Use: Geo-Seal EFC Gel is a plural component, semi-rigid, 100% solids epoxy used as cove paste, joint sealant, and crack filler. It features a combination of excellent adhesion and elongation not available in general purpose epoxies. Formulated to produce a workable paste with the addition of fine aggregate or decorative color quartz aggregate, it reinforces concrete joint edges, and minimizes the deterioration of concrete joint/crack edges to impacts. Geo-Seal EFC Gel should be used in lieu of elastomeric sealants that meet ASTM C920 Standard Specification for Elastomeric Joint Sealants which do not reinforce concrete joint edges. Geo-Seal EFC Gel can also be used as a "cove gel" for hanging a semi-rigid cove or skim coat for vertical wall applications.

Composition: Geo-Seal EFC Gel is a plural component, thixotropic, 100% solids, semi-rigid epoxy.

Benefits

- Easily workable concrete surface repair material of common spalls, cracks, bug holes and other concrete imperfections when mixed with fine aggregate.
- Versatile application as a concrete surface repair material, concrete edge reinforcement material or "cove gel" material.
- Self priming as a concrete repair material.
- Complies with USDA and FDA requirements.
- VOC and EPA Compliant in all states and provinces in North America.

Limitations

- Best suited for applications in temperatures between 55°F to 90°F. Do not apply when relative humidity exceeds 85%.
- Higher temperatures will result in shortened working time and faster drying time.

Technical Data

Shelf life: 1 year maintained between a 40°F and 100°F.

Properties: See physical properties table.

Specification Writer: Contact EPRO before writing specifications on this product. Geo-Seal system assemblies should be reviewed in order to meet project specific site conditions.

Installation

Surface Preparation: All materials that may inhibit bonding must be removed. No surface priming is necessary when mixed with aggregate and applied as a concrete repair material or cove gel. Coating applications may require a primer. See EPRO Tech Bulletin: How to Choose a Primer. A test area should always be done prior to application using the same cleaning preparation and application procedures to be used on the project.

Application: Please refer to manufacturer's specifications.

Cleaning: Clean all tools and equipment with an acetone solvent or equivalent.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Geo-Seal EFC Gel is available in 1 gallon kits with gel additive. Silica aggregate sold separately.

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

Geo-Seal EFC Gel

Equipment

Variable low speed drill with impeller mixing paddle. Clean margin trowels or spatula for patching applications. 1 1/2" blade for filling cracks.

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

Typical Physical Properties

Physical Property	Value
Color	Clear
Solids Content	100%
VOC Content	0 gr./lt.
Shelf Life	1 year

Packaging: 1 gallon with gel additive.

Mix Ratio by Volume: 2:1
Mix Ratio by Weight: 2.29:1
Minimum Substrate Application Temperature: 40°F
Pot Life at 77°F (Standard): 30 minutes
Dry to Touch (40°F - 90°F. Standard): 6 - 8 hours
Recoat Time (40°F - 90°F. Standard): 12 - 72 hours
Light Traffic (40°F - 90°F. Standard): 6 - 8 hours

PM Sealant

Product Description

Basic Use: PM Sealant is a Silyl Terminated Polyether (STPE) non-isocyanate, non-solvent detailing sealant that combines the strength of polyurethanes with the weathering resistance of silicones. PM Sealant can withstand the most stringent requirements for high performance bonding and elasticity under severe aging and UV weathering conditions without cracking or yellowing when subjected to extended UV-light exposure.

PM Sealant is used for penetration detailing, as a seam edge and patching detailing sealant, along the transition construction joint between two pours, and for sealing applied termination bar.

Compliances: Conforms to ASTM C920, Type S, Grade NS, Class 25, and AAMA 802.3 Type II Back Bedding Compound. USDA accepted.

Composition: PM Sealant is a gray, single-component, 100% solids, moisture-cured, elastomeric STPE sealant.

Benefits

- Replaces Silicone and Urethane sealants.
- Does not require a primer.
- Cures rapidly, even at low temperatures, and retains its properties to -75°F (-59°C).
- Non-reactive, PM Sealant will not oxidize or corrode metals.
- PM Sealant does not contain VOC's.
- Provides a continuous smooth surface.

Limitations

- Surfaces must be clean and dry for application.
- Surfaces must be free from frost or ice.

Technical Data

Properties: See physical properties table.

Coverages: Coverage is dependent on the size of application bead. Minimum Bead Size & Estimated Linear Coverage:

- 3/8" x 3/8" (10 mm x 10 mm): Penetrations, seam edges, corner & patch detailing.
  - Sausage: 21' (6.4 m)
- 3/4" x 3/4" with 1" cant (19 mm x 19 mm with 25 mm cant): Horizontal to vertical footing or brick ledge transition joint, wall vertical inside corner.
  - Sausage: 11' (3.4 m)

Storage and Handling: Store raised off the floor, away from moisture and sun, between 55-80°F (13-27°C).

Shelf Life: Sausage = 12 months.

Specification Writer: Contact EPRO before writing specifications on this product. EPRO System selection should be reviewed in order to meet project specific site conditions.

Installation

Preparation: Please refer to manufacturer's specifications for substrate requirements. Buckets and Sausages should be inspected for cosmetic damage prior to application.

Application: Please refer to manufacturer's specifications.

Substrate Preparation: Use with adequate ventilation. Wipe substrates to receive PM Sealant clean to remove any dirt, dust, or moisture. Clean the surface of penetrations or protrusions with a wire brush to remove dirt, dust, rust, and loose particles. Surface must be free of frost or ice. No priming is necessary.

Installation: Determine minimum bead thickness and tool into surface.

Horizontal to vertical transition joints shall be applied like a caulk into a 1" (25 mm) cant, making sure product is injected into the joint with as well as applied to the surface.

Availability and Packaging

Contact EPRO sales representative for local distributors or authorized applicators (www.eproinc.com).

Sausage Size: 20 oz (591 ml), 2.5 lbs (1.13 kg)
Case Size: 20 sausages, 50 lbs (22.7 kg)

Warranty

Limited Warranty: EPRO Services, Inc. believes to the best of its knowledge that performance tables are accurate and reliable. EPRO warrants this product to be free from defects. EPRO makes no other warranties with respect to this product, express or implied, including without limitation the implied warranties of MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

Equipment

Caulking gun (20 oz. sausage capactiy), knife, box cutter.

Technical Services and Information

Complete technical services and information are available by contacting EPRO at 800.882.1896 or www.eproinc.com.

This product was formally known as Primetak Detail Sealant by Kingfield Construction Products.

PM Sealant

Physical Property	Test Method	Value
Material		STPE
Color		Gray
Corrosive Properties		Non-corrosive
High Temperature Resistance		Up to 300°F for short periods
Low Temperature Flexibilty		Properties retained to -75°F (-59°C)
Skin Time		< 30 minutes @ 77°F & 50% RH
Tack Free Time	ASTM C 679	< 60 minutes @ 77°F & 50% RH
Sag	ASTM D 2202	Non-sagging
Staining	ASTM C 510	Non-staining
Tensile Strength	ASTM D 412	225 PSI
Lap Shear (shear rate = 1"/min)	(internal eq. ASTM D 1002)	275 PSI
Elongation	ASTM D 412	275%
Hardness	ASTM C 661	45-50
Ultraviolet Radiation (UV) Rating	ASTM G 26	2000+ hours UV-A, no change in appearance or physical properties

Dimensions: Sausage: 20 oz (591 ml)
Weight: Sausage: 2.5 lbs (1.13 kg)

Applications:	**Vapor Intrusion Coating for Existing Structures**
Spec Version:	**EPRO SPEC Geo-SealEFC.v2.10.21**
Date issued:	**October, 2021**
Note:	**This specification may be superseded at any time. Check eproinc.com for the most up to date version of this specification.**

SECTION 09 96 56
EPOXY FLOOR COATINGS

Geo-Seal EFC Guide Specification
Contaminate Vapor Intrusion
Epoxy Floor Coating

Geo-Seal EFC is a highly chemically resistant, impervious epoxy coating specially formulated to protect existing structures from contaminant vapor intrusion without the need for additional concrete protection. This guide specification has been prepared according to the principles established in the Manual of Practice published by the Construction Specification Institute.

For additional questions, your local EPRO technical representative can be contacted through: EPRO Services, Inc., Wichita KS; 1.800.882.1896; www.eproinc.com.

GEO-SEAL EFC CONTAMINATE VAPOR INTRUSION EPOXY FLOOR COATING SPECIFICATION

SECTION 09 96 56 – EPOXY FLOOR COATING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including general and supplementary conditions, and Division 1 specification section, apply to this section.

1.2 SECTION INCLUDES

A. The Work of this Section includes, but is not limited to, Geo-Seal EFC Contaminate Vapor Intrusion Epoxy Floor Coating.

B. Related Sections:

1. Section 02 24 00: Environmental Assessment
2. Section 02 32 00: Geotechnical Investigation
3. Section 03 30 00: Cast-in-Place Concrete
4. Section 03 40 00: Precast Concrete
5. Section 07 92 00: Joint Sealants
6. Section 09 00 00: Finishes

1.3 REFERENCE STANDARDS

A. The following standards and publications are applicable to the extent referenced in the text.

B. American Standard Testing Methods (ASTM):

D 695 Standard Test Method for Compressive Properties of Rigid Plastics

D 790 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials

D 638 Standard Test Method for Tensile Properties of Plastics

D 1044 Standard Test Method for Resistance of Transparent Plastics to Surface Abrasion by the Taber Abraser

D 2240 Standard Test Method for Rubber Property—Durometer Hardness

D 2794 Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)

C 666 Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing

D 4060 Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser

D 522 Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings

F 1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

F 2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

C. American Concrete Institute (ACI):

503 Guide for the Selection of Polymer Adhesives in Concrete

1.4 PERFORMANCE REQUIREMENTS

A. General: Provide a complete contaminate vapor intrusion epoxy floor coating system for concrete surfaces that meet the requirements for specific use indicated in the contract documents. Include all applicable substrate testing, surface preparation, and detail work.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's printed technical data, tested physical and performance properties, instructions for evaluating, preparing, and treating substrates, and installation instructions.

B. Shop Drawings: Project specific drawings showing locations and extent of coating, details for substrate joints and cracks, drains, penetrations, transitions, and termination conditions.

C. Samples: Submit two standard size samples of the following:

1. Individual components of the specified coating system.

D. Applicator Certification: Submit written confirmation at the time of bid that applicator is currently approved by the coating manufacturer.

E. Manufacturer’s Warranty Requirements: Submit complete documentation of manufacturer’s warranty requirements and sample warranty.

1.6 QUALITY ASSURANCE

A. Applicator Qualifications: Epoxy coating applicator shall be an EPRO Authorized Applicator who is trained and approved for ***Geo-Seal EFC*** application in accordance with EPRO standards and policies.

B. Pre-Construction Meeting: A meeting shall be held prior to application of the epoxy floor coating system to assure proper substrate preparation, confirm installation conditions and any additional project specific requirements. Attendees of the meeting shall include, but are not limited to the following:

1. EPRO representative

2. EPRO certified applicator

3. General contractor

4. Owner’s representative

5. Project design team

6. All appropriate related trades

C. Field Sample: Apply epoxy coating system field sample to 100 ft^2 (9.3 m^2) of each assembly to demonstrate proper application techniques, standard of workmanship, and to confirm the aesthetic of the coating is acceptable.

1. Notify epoxy coating system manufacturer representative, architect, and other appropriate parties one week in advance of the dates and times when field sample will be prepared.

2. If architect and manufacturer representative determine that field sample does not meet requirements; reapply epoxy coating system until field sample is approved.

3. Retain and maintain approved field sample during construction in an undisturbed condition as a standard for judging the completed epoxy coating system. An undamaged field sample may become part of the completed work.

D. Materials: Epoxy coating system and auxiliary materials shall be single sourced from the epoxy coating manufacturer.

1.7 MATERIAL DELIVERY, STORAGE AND DISPOSAL

A. Delivery: Deliver materials to site labeled with manufacturer's name, product brand name, material type, and batch number. Upon the arrival of materials to the jobsite, inspect materials to confirm material has not been damaged during transit.

B. Storage: Proper storage of onsite materials is the responsibility of the certified applicator. Consult product data sheets to confirm storage requirements. Storage area shall be clean, dry, and protected from the elements. Protect stored materials from direct sunlight.

C. Disposal: Remove and replace any material that cannot be properly applied in accordance with local regulations and specification section 01 74 19.

1.8 PROJECT CONDITIONS

A. Substrate Review: Substrates shall be reviewed by the certified applicator and accepted by the certified inspector prior to application.

1.9 WARRANTY

A. General Warranty: The special warranty specified in this section shall not deprive the owner of other rights the owner may have under other provisions of the contract documents, and shall be in addition to, and run concurrent with, other warranties made by the contractor under requirements of the contract documents.

B. Special Warranty: Submit a written warranty signed by waterproofing manufacturer agreeing to replace system materials that do not conform with manufacturer’s published specifications or are deemed to be defective. Warranty does not include failure of the epoxy coating due to failure of concrete substrate prepared or formation of new joints and cracks.

1. Warranty Period: 1 year after date of application.

2. Coverage: Manufacturer will guarantee that the material provided is free of defect for the warranty period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: EPRO Services, Inc. (EPRO), P.O. Box 347; Derby, KS 67037; Tel: (800) 882-1896; Email: info@eproinc.com; Web: www.eproinc.com

2.2 MATERIALS

A. Contaminate vapor intrusion epoxy coating: ***Geo-Seal EFC*** is a highly chemically resistant, impervious epoxy coating specially formulated to protect existing structures from contaminant vapor intrusion without the need for additional concrete protection. Provide system with the following physical properties:

PROPERTIES	VALUE	TEST METHOD
Compressive Strength	14,500 PSI (16,500 PSI with aggregate)	ASTM D 695
Flexular Strength	19,200	ASTM D 790
Tensile Elongation	1.0%	ASTM D638
Abrasion Resistance	20-25 mg.	ASTM D 1044
Bond Strength	>350 psi 100% concrete failure	ACI 503
Hardness (Shore D)	89-93	ASTM D 2240
Impact Resistance	160 in. / lbs.	ASTM D 2794
Freeze Thaw Resistance	300 cycles (pass)	ASTM C 666

Primer

1. ***Geo-Seal EFC Primer*** is a is a plural component, low VOC, water based, low viscosity, concrete penetrating epoxy primer with the following physical properties:

PROPERTIES	VALUE	TEST METHOD
Hardness (Shore D)	78-80	ASTM D 2240
Bond Strength	>350	ACI 503
Impact Resistance	160 in./lbs.	ASTM D 2794
Abrasion Resistance	45-50 mg.	ASTM D 1044
Compressive Strength	7800 PSI	ASTM D 695
Flexular Strength	10,360 PSI	ASTM D 790
Tensile Elongation	6.5%	ASTM D 638
Tensile Strength	6790	ASTM D 638
Freeze Thaw Resistance	300 Cycles (Pass)	ASTM C 666

Optional Top Coat

1. ***Geo-Seal EFC Clear Coat*** is a is a plural component, low VOC polyaspartic topcoat designed to increase the longevity of the system and has the following physical properties:

PROPERTIES	TEST METHOD	VALUE
Hardness (Shore D)	65-70	ASTM D 2240
Abrasion Resistance	90-95 mg	ASTM D 4060
Flexibility	1/8" (Pass)	ASTM D 522
Freeze Thaw Resistance	300 Cycles (Pass)	ASTM C 666

2.3 AUXILIARY MATERIALS

A. General: All auxiliary materials shall be provided by the specified coating manufacturer. Auxiliary materials used in lieu of, or in addition to, the manufacturer's materials must be approved in writing by EPRO prior to installation.

1. Detailing Material: ***PM Sealant*** an STPE moisture cure detailing sealant.

2. Substrate Patching Material: ***Geo-Seal EFC Gel*** is a plural component, thixotropic, 100% solids, semi-rigid epoxy.

3. Backer Rod: Closed cell polyethylene foam

PART 3 - EXECUTION

3.1 EXAMINATION

A. Comply with project documents, manufacturer's product information, including product application and installation guidelines, pre-job punch list, as well as, manufacturer's shipping and storage recommendations.

B. Examine all substrates, areas, and conditions under which the epoxy coating system will be installed, applicator and inspector must be present. Do not proceed with installation until unsatisfactory conditions have been corrected and surface preparation requirements have been met. If conditions exist that are not addressed in this section notify inspector and contact EPRO for additional clarification.

1. That the concrete deck surface is free of ridges and sharp projections, sound and dry.

2. That the concrete was cured for a minimum of 28 days. (Minimum of 3,500 psi compressive strength). The use of concrete curing agents, if any, shall be of the sodium silicate base only; others require written approval by EPRO.

3. That damaged areas of the concrete substrate be restored to match adjacent areas. Use Geo-Seal EFC Gel for filling and leveling mixed with recommended amount of aggregate/filler.

4. Due to hydrostatic, capillary and moisture vapor pressure, the moisture vapor emission of concrete shall not exceed 3 lbs/1,000 sq. ft./24 hrs, when tested by the quantitative calcium chloride test method (ASTM F1869). Relative Humidity is not to exceed 75% when tested by In-situ Probe Test (ASTM F2170). If site conditions exceed these parameters, moisture mitigation primers are available.

3.2 SUBSTRATE PREPARATION

A. Clean and prepare substrate according to manufacturer's written recommendations. Provide clean, relatively smooth, dust free, and dry substrate for epoxy coating application. The pH of the concrete substrate should be at 9 or above.

B. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, acid residues, and other penetrating contaminants or film-forming coatings from substrate. Contaminated surfaces must be vigorously scrubbed with a power broom and a strong non-sud detergent. Areas where oil or other contaminants penetrate deep into the concrete may require removal by mechanical methods.

C. Mechanically prepare surface by shot-blasting or diamond grinding to industry standard surface texture (ICRI's CSP3-4) without causing additional surface defects to substrate. Shot-blasting and diamond grinding does not remove deep penetrating oils, grease, tar or asphalt stains. Follow proper cleaning procedures to ensure proper bonding of the epoxy coating. Note: Contact EPRO Technical Service for alternative surface preparation methods.

D. Fill all non-moving cracks with Geo-Seal EFC Gel after shotblasting. Fill control and cold joints flush with Geo-Seal EFC Patch at 3/4" depth. Install backer rod if necessary to limit depth to 3/4".

E. Seal expansion and isolation joints =/< 1" in width PM Sealant. Sealant shall be applied to inside of joint only, not applied to floor surface.

3.3 APPLICATION

A. General: The contaminate vapor intrusion epoxy floor coating shall be applied to the vertical wall or slab under strict accordance with the manufacture's guideline and project specifications. Complete all substrate preparation before applying the coating over the field of the substrate.

B. Primer Application

1. Mix at lowest RPM to prevent air entrapment in prepared mix and apply Geo-Seal EFC Primer at a minimum rate of 200 square feet per gallon (8 mils WFT) to prepared substrate with a notched squeegee. Back roll with a short napped phenolic roller to assure even coverage.

C. Base Coat Application

1. Mix at lowest possible RPM to prevent air entrapment in prepared mix and apply 20 mil coat of Geo-Seal EFC at a minimum rate of 80 square feet per gallon (20 mils WFT) to properly primed and prepared substrate with a notched squeegee. Back roll with a short napped phenolic roller to assure even coverage.

D. Aggregate Application

1. Broadcast blended silica quartz into wet epoxy base coat until refusal at a rate of approximately 50 pounds per 100 square feet. Maintain a one to two foot wet edge without any aggregate to allow for a smooth transition to the next pass of neat epoxy. Allow to cure 8 to 12 hours at 70°F/21°C. Remove excess aggregate and lightly sand with a circular floor sander and #50 grit sandpaper to remove any rough spots.

E. Top Coat Application

1. Mix at lowest RPM to prevent air entrapment in prepared mix and apply Geo-Seal Clear Coat a minimum rate of 160 square feet per gallon (10 mils WFT) over Geo-Seal EFC base coat with a notched squeegee. Back roll with a short napped phenolic roller to assure even coverage.

3.4 QUALITY CONTROL

A. ***Geo-Seal EFC*** is 100% solids. When applied 1 gallon will yield 80 square feet. Confirm the amount of material used corresponds the square footage of application.

B. Use a wet film gauge to spot check the thickness of ***Geo-Seal EFC*** to make certain the proper mil thickness has been applied. Since the material is 100% solid, the material will not shrink after curing. Due to the thickness of the coating and the uneven substrate professional judgement will need to be utilized because of high or low points in the underlying substrate.

3.5 PROTECTION AND CLEANING

A. Strictly comply with installation guidelines in manufacturer's published literature, including but not limited to, the following:

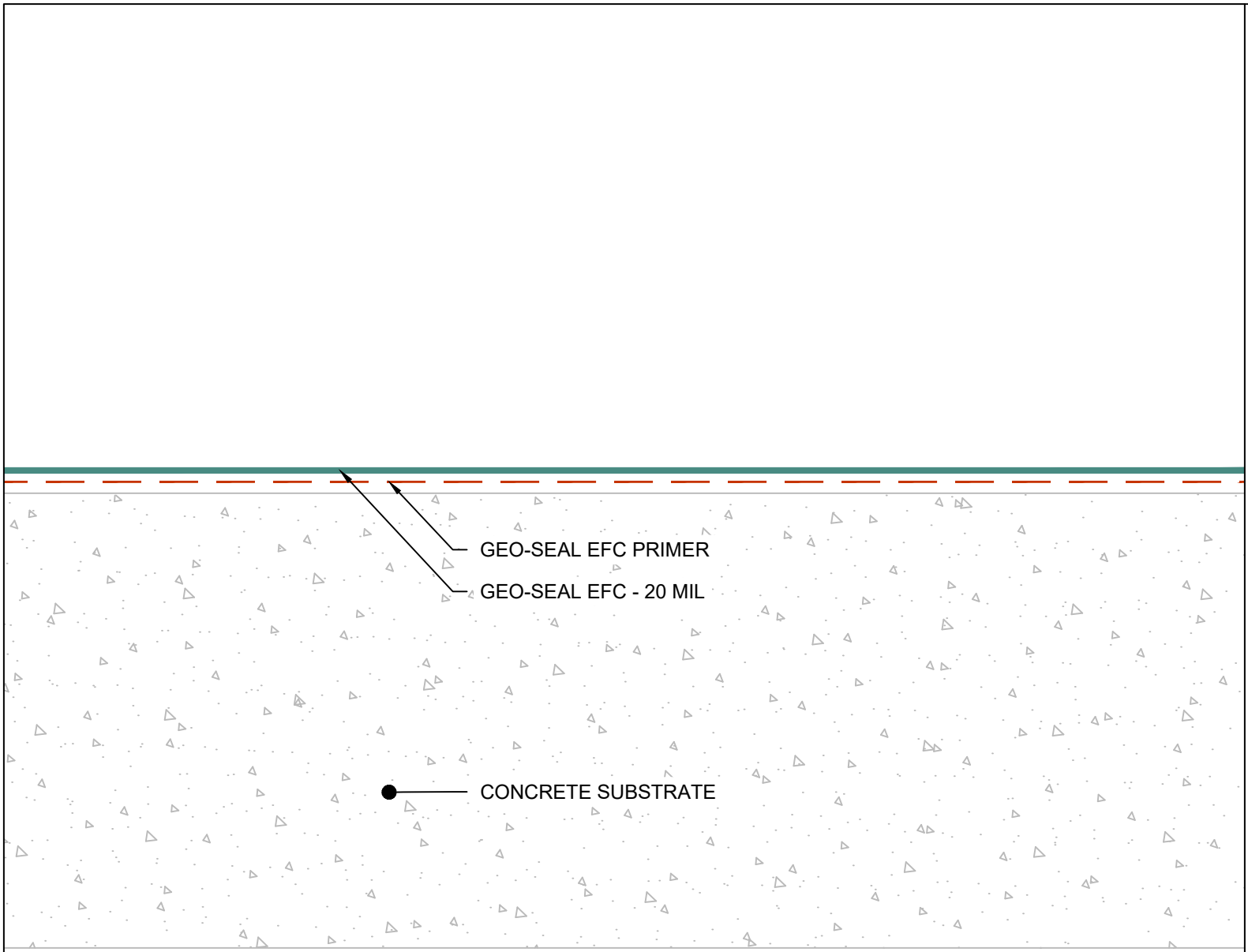
1. After completion of application, allow system to cure for 24 hours at 75°F/23°C before allowing foot traffic, 48 hours before allowing heavy loading.

2. Properly dispose of all debris and unused materials.

3. Clean tools and surfaces before the materials cure.

B. Proper and routine floor care will extend the life of ***Geo-Seal EFC.*** Use a damp mop to clean dust and debris from coating, conventional commercial cleaners are acceptable. Never us any abrasive cleaners to clean the coating system.

End of Section



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Geo-Seal® Vapor Intrusion Barrier

DRAWIMG NUMBER
60.001.0

SYSTEM NAME
GEO-SEAL EFC

SYSTEM DESCRIPTION
STANDARD APPLICATION

DATE
12/08/2021

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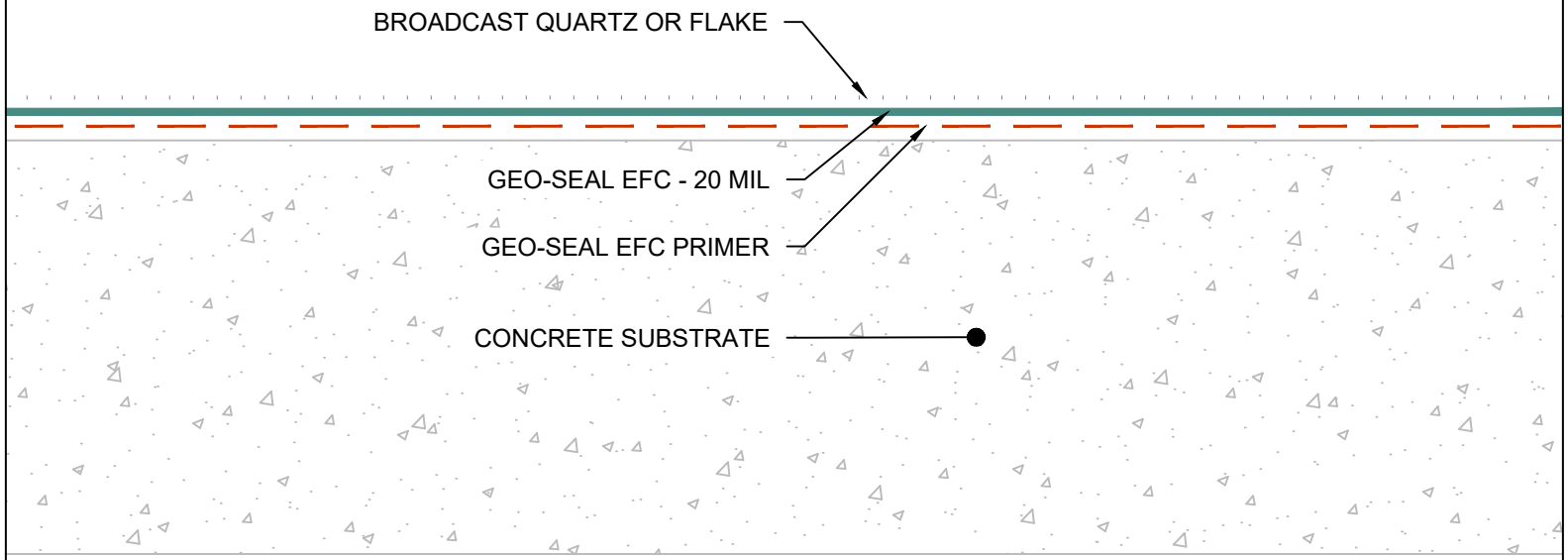
RJT	NTS



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Geo-Seal® Vapor Intrusion Barrier

DRAWIMG NUMBER
60.002.0

SYSTEM NAME
GEO-SEAL EFC

SYSTEM DESCRIPTION
BROADCAST APPLICATION

DATE
12/08/2021

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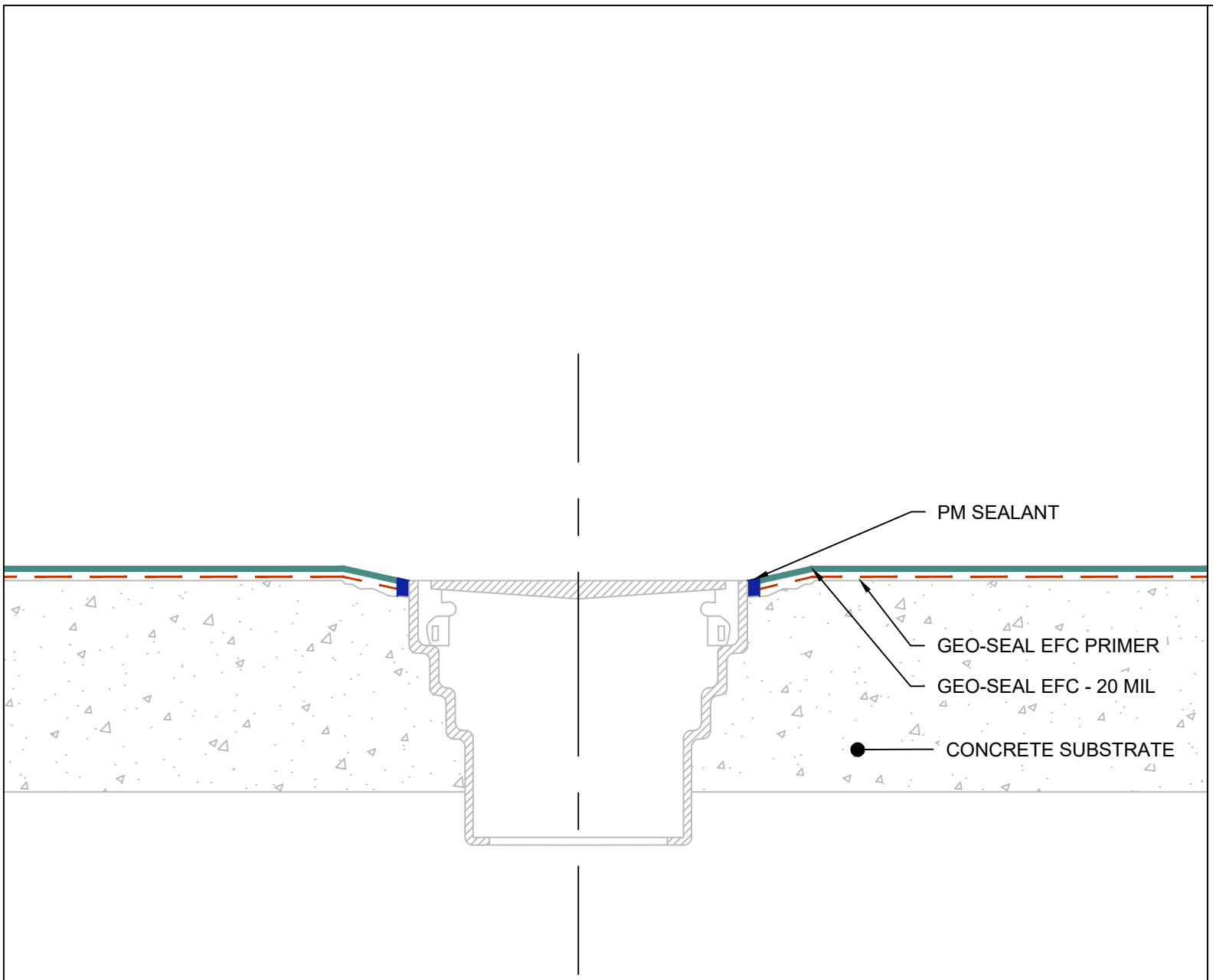

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DRAWIMG NUMBER
60.003.0

SYSTEM NAME
GEO-SEAL EFC

SYSTEM DESCRIPTION
AREA DRAIN DETAIL

DATE
12/08/2021

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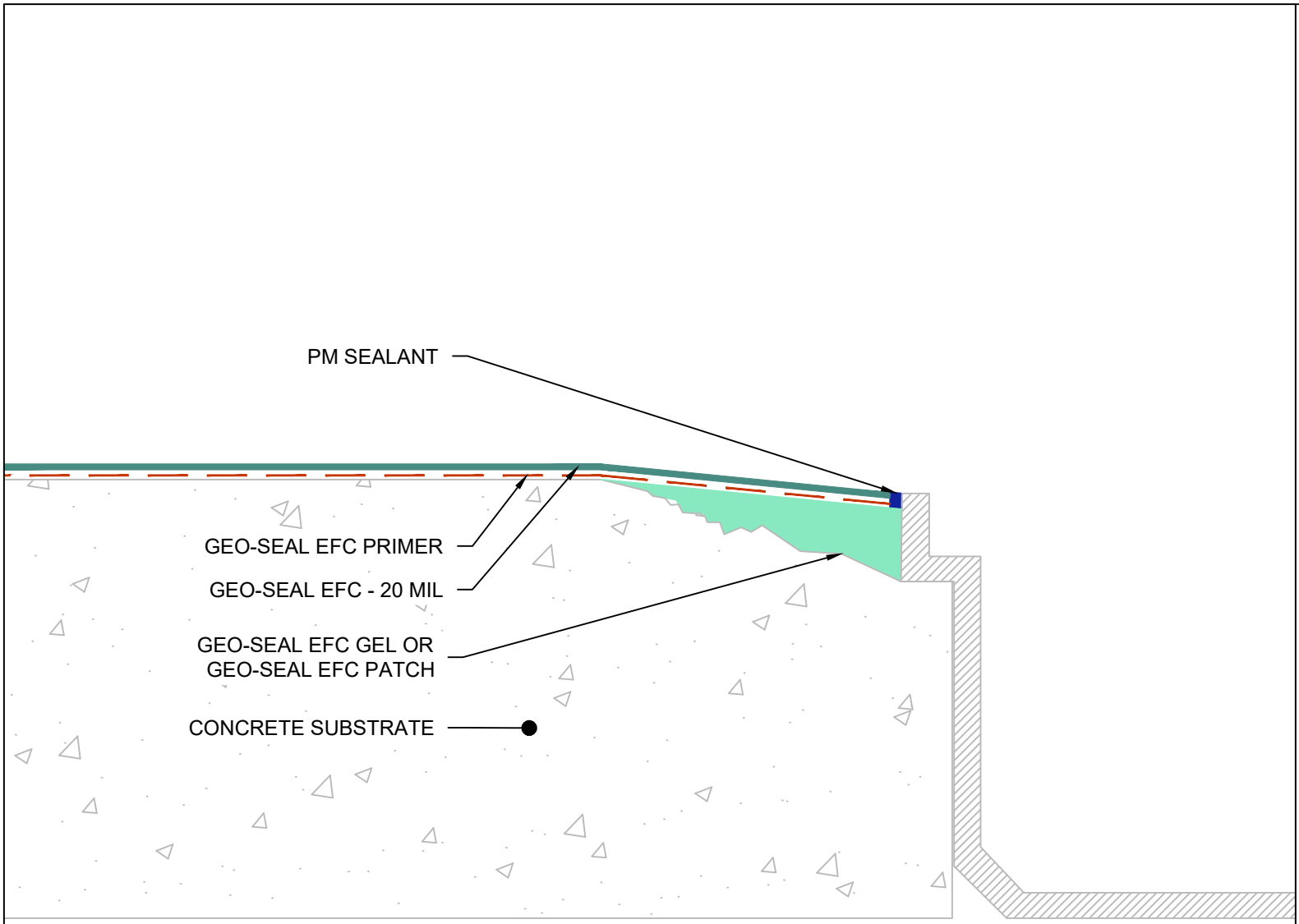

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Geo-Seal® Vapor Intrusion Barrier

DRAWIMG NUMBER
60.004.0

SYSTEM NAME
GEO-SEAL EFC

SYSTEM DESCRIPTION
PRE-FABRICATED TRENCH DRAIN

DATE
12/08/2021

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PAGE 1 OF 1

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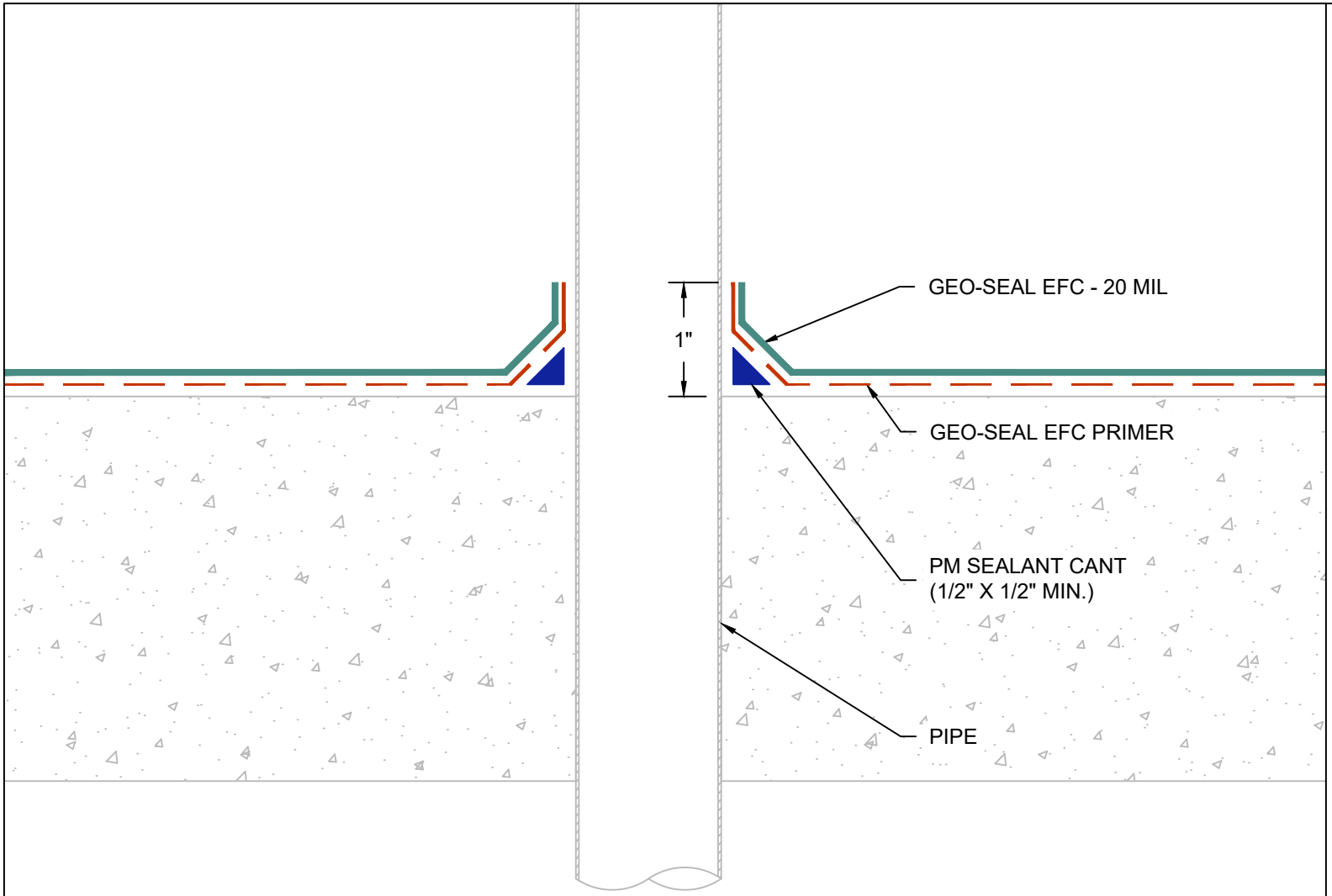

NOTES:

1. ALL PIPES, CONDUITS, AND SLEEVES SHALL BE FREE OF DIRT, CONCRETE SPLATTER, PAINT, OIL, AND RUST.

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Geo-Seal® Vapor Intrusion Barrier

DRAWIMG NUMBER
60.005.1

SYSTEM NAME
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SYSTEM DESCRIPTION
PIPE PENETRATION OPTION 1

DATE
12/08/2021

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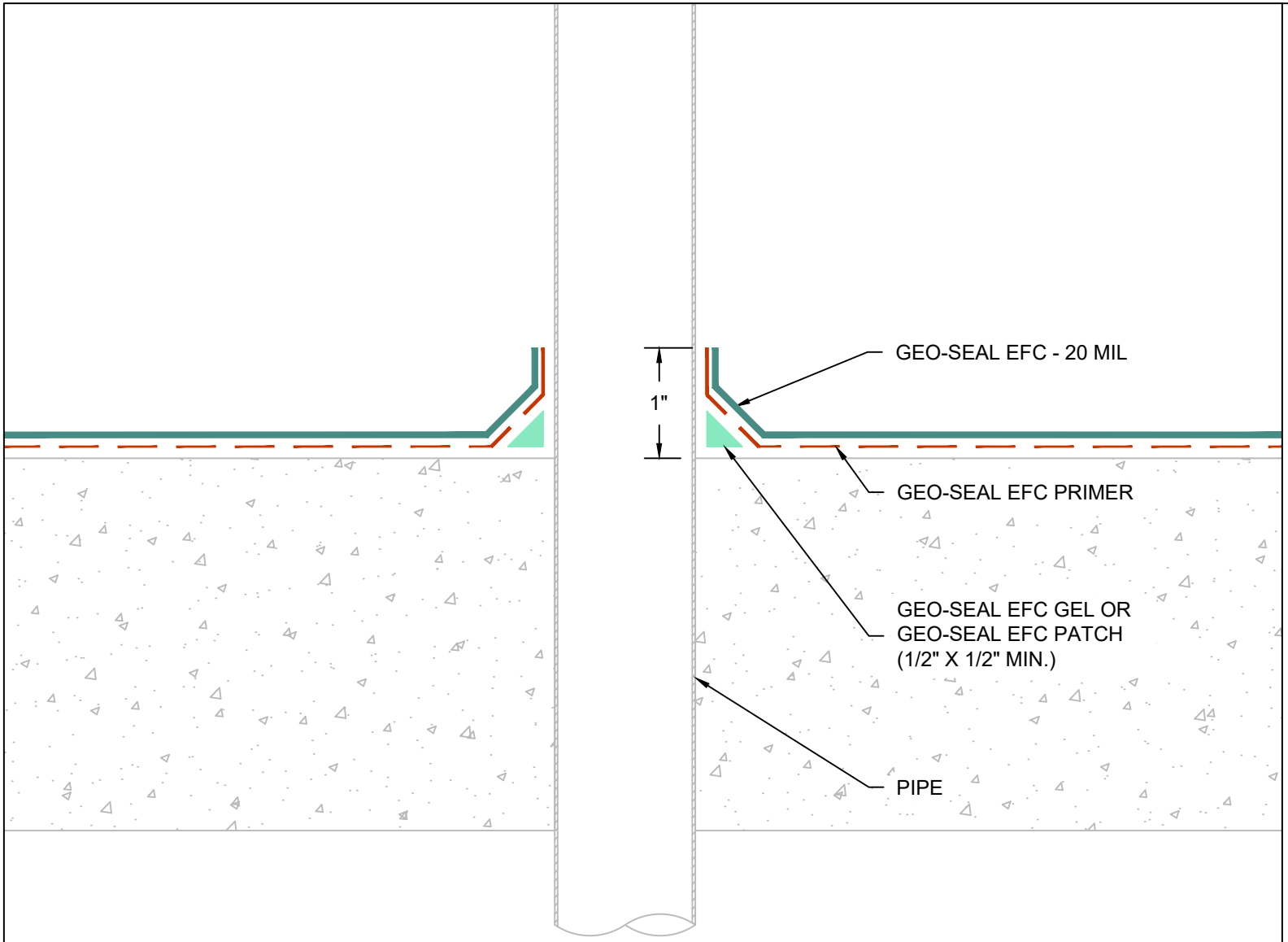

NOTES:

1. ALL PIPES, CONDUITS, AND SLEEVES SHALL BE FREE OF DIRT, CONCRETE SPLATTER, PAINT, OIL, AND RUST.

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DRAWIMG NUMBER
60.005.2

SYSTEM NAME
GEO-SEAL EFC

SYSTEM DESCRIPTION
PIPE PENETRATION OPTION 2

DATE
12/08/2021

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RJT	NTS

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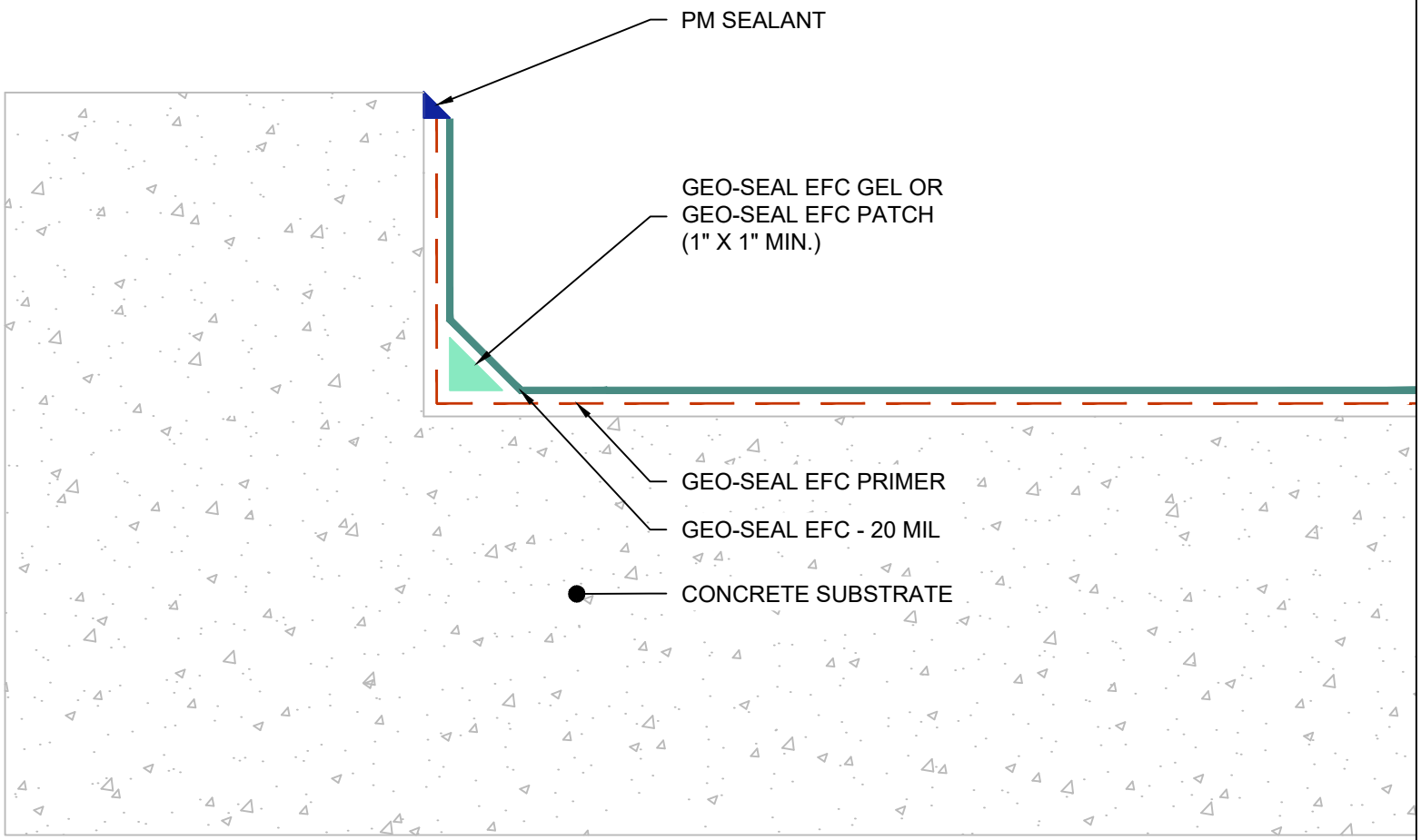

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Geo-Seal® Vapor Intrusion Barrier

DRAWIMG NUMBER
60.006.0

SYSTEM NAME
GEO-SEAL EFC

SYSTEM DESCRIPTION
STANDARD TROWEL COVE BASE

DATE
12/08/2021

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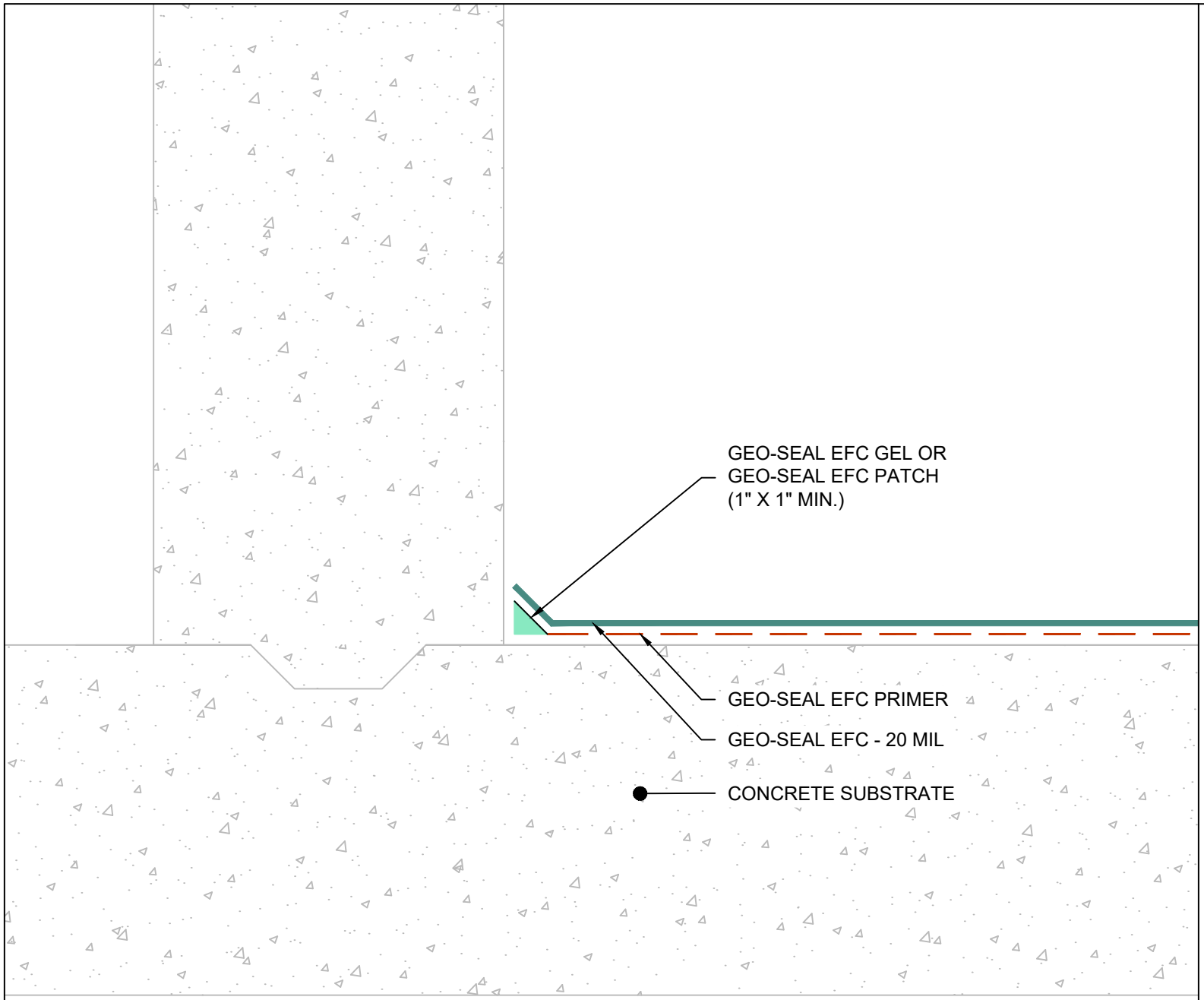

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Geo-Seal® Vapor Intrusion Barrier

DRAWIMG NUMBER
60.007.0

SYSTEM NAME
GEO-SEAL EFC

SYSTEM DESCRIPTION
TERMINATION AT COVE BASE

DATE
12/08/2021

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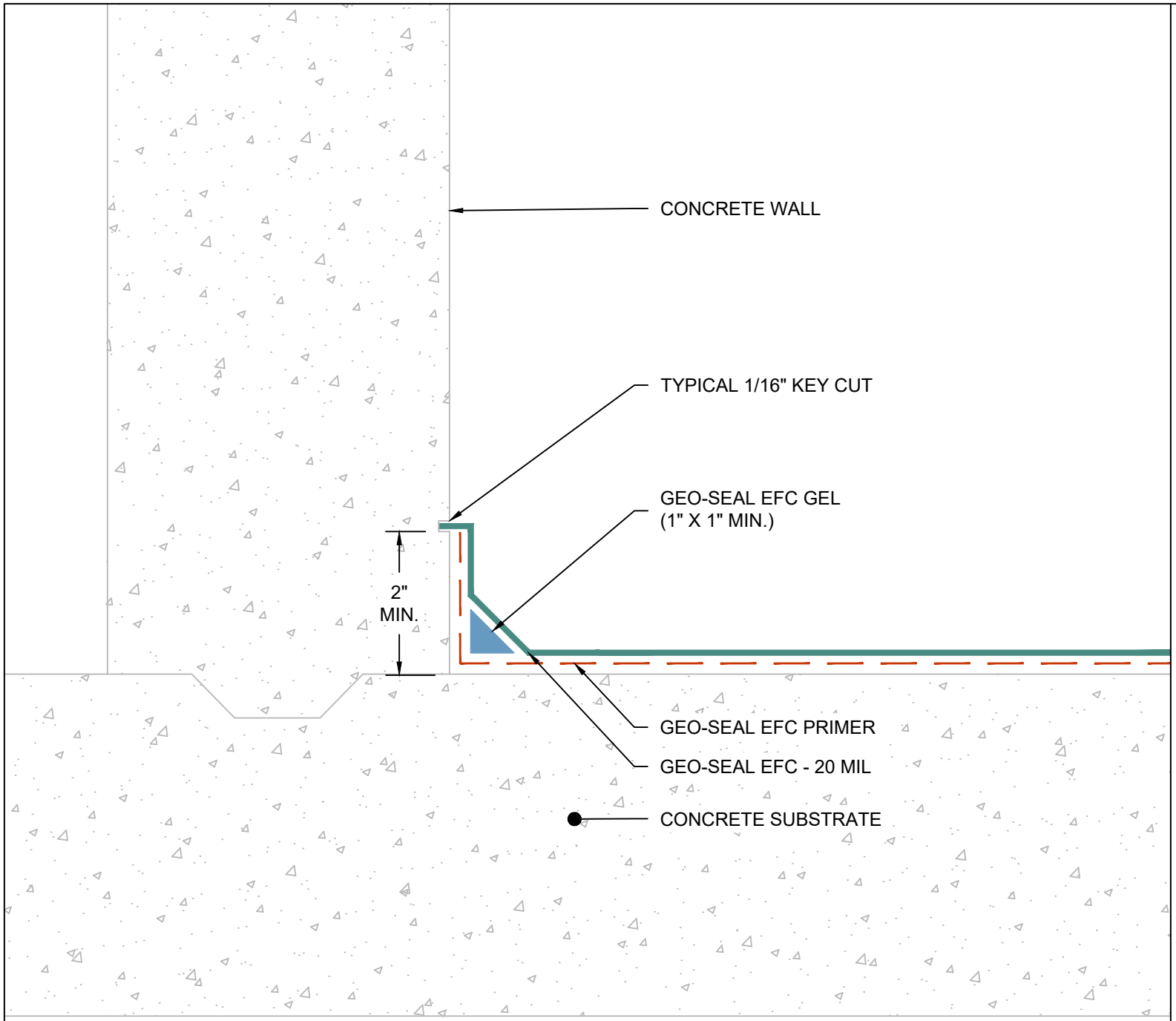
RJT	NTS



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Geo-Seal® Vapor Intrusion Barrier

DRAWIMG NUMBER
60.008.0

SYSTEM NAME
GEO-SEAL EFC

SYSTEM DESCRIPTION
HORIZONTAL TO VERTICAL STANDARD COVE BASE TERMINATION

DATE
12/08/2021

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PAGE 1 OF 1

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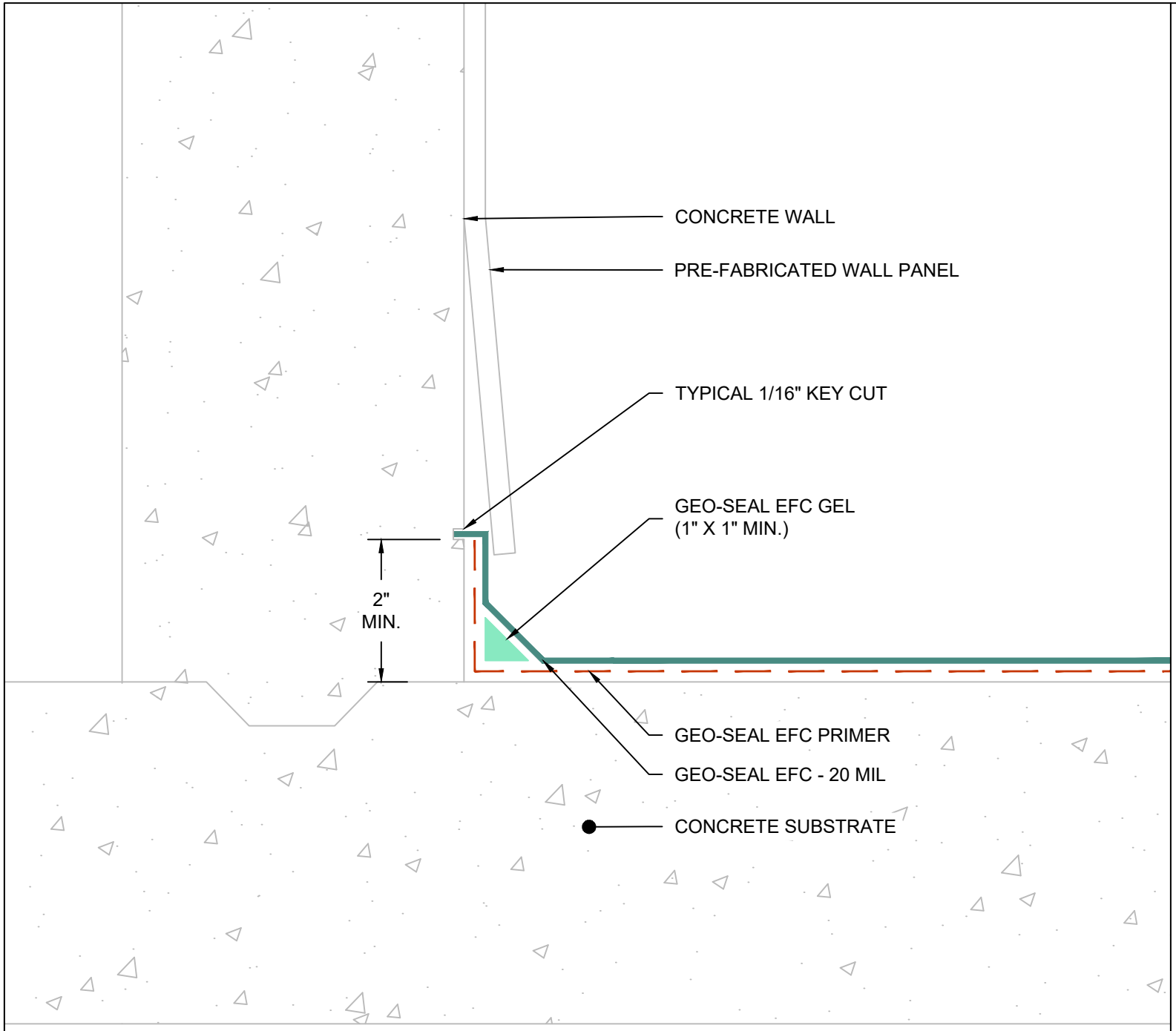

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DRAWIMG NUMBER
60.009.0

SYSTEM NAME
GEO-SEAL EFC

SYSTEM DESCRIPTION
HORIZONTAL TO VERTICAL STANDARD COVE BASE TERMINATION AT PRE FABRICATED WALL SYSTEM

DATE
12/08/2021

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PAGE 1 OF 1

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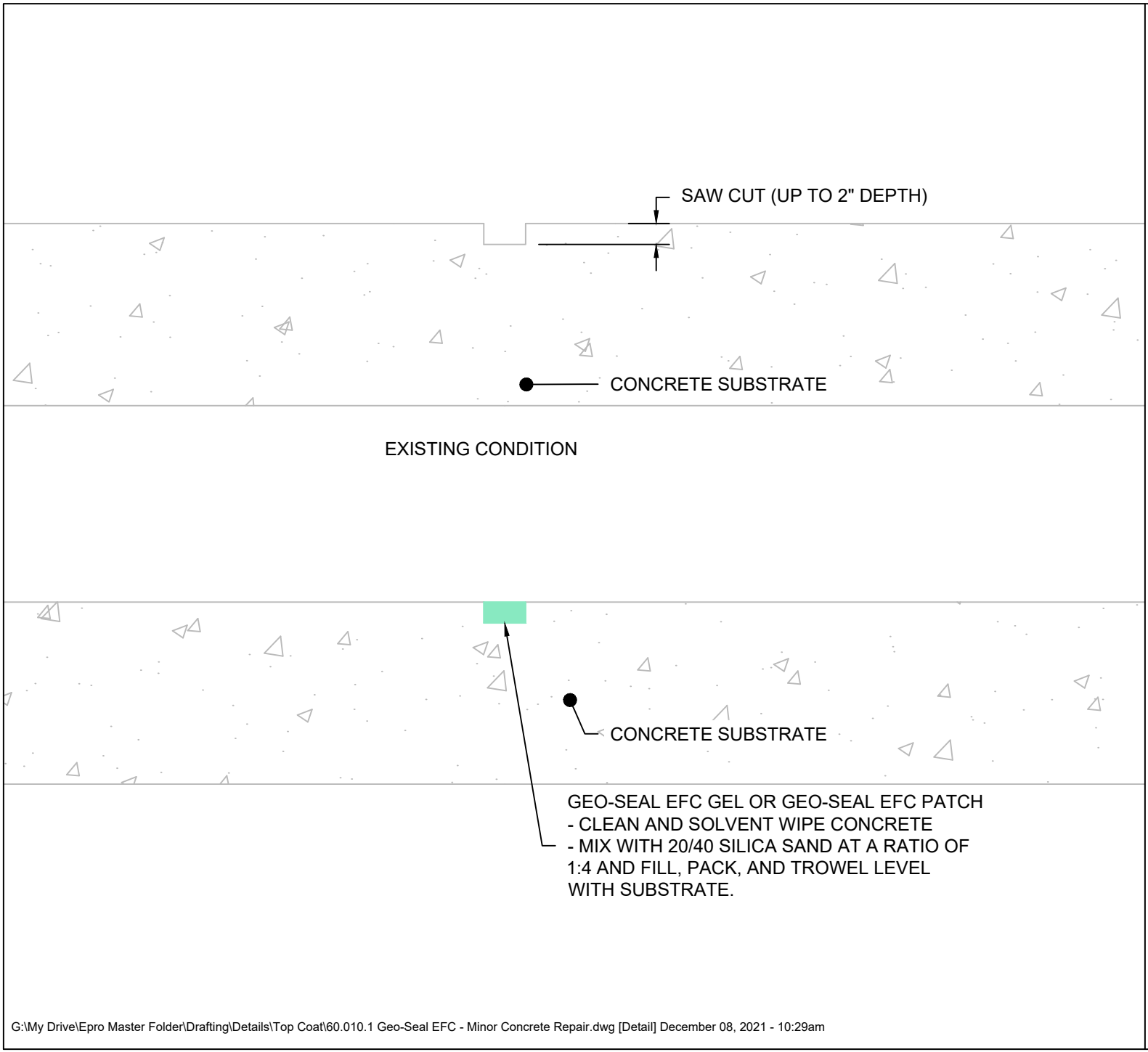

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Geo-Seal® Vapor Intrusion Barrier

DRAWIMG NUMBER
60.010.1

SYSTEM NAME
GEO-SEAL EFC

SYSTEM DESCRIPTION
MINOR CONCRETE REPAIR

DATE
12/08/2021

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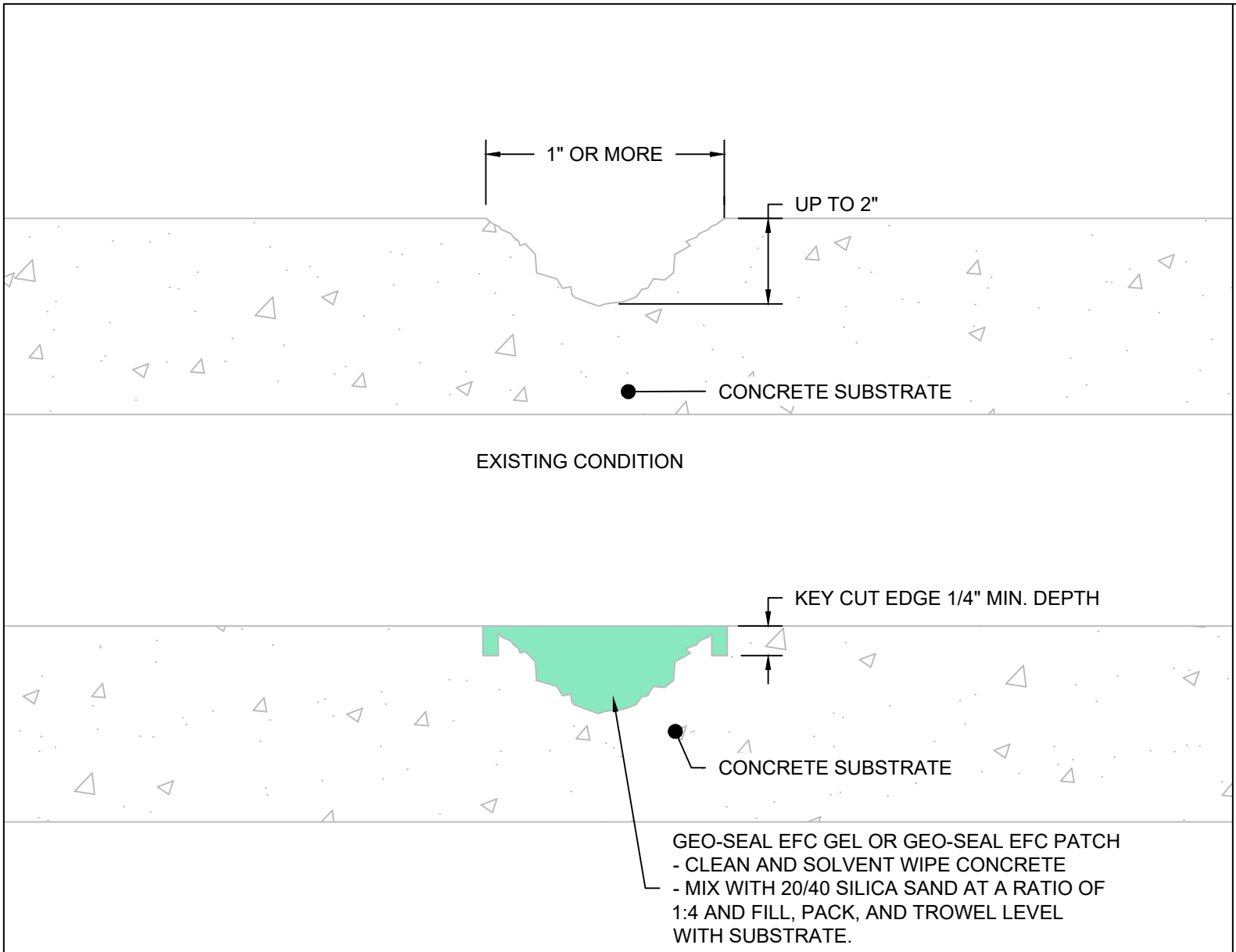

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Geo-Seal® Vapor Intrusion Barrier

DRAWIMG NUMBER
60.010.2

SYSTEM NAME
GEO-SEAL EFC

SYSTEM DESCRIPTION
MAJOR CONCRETE REPAIR

DATE
12/08/2021

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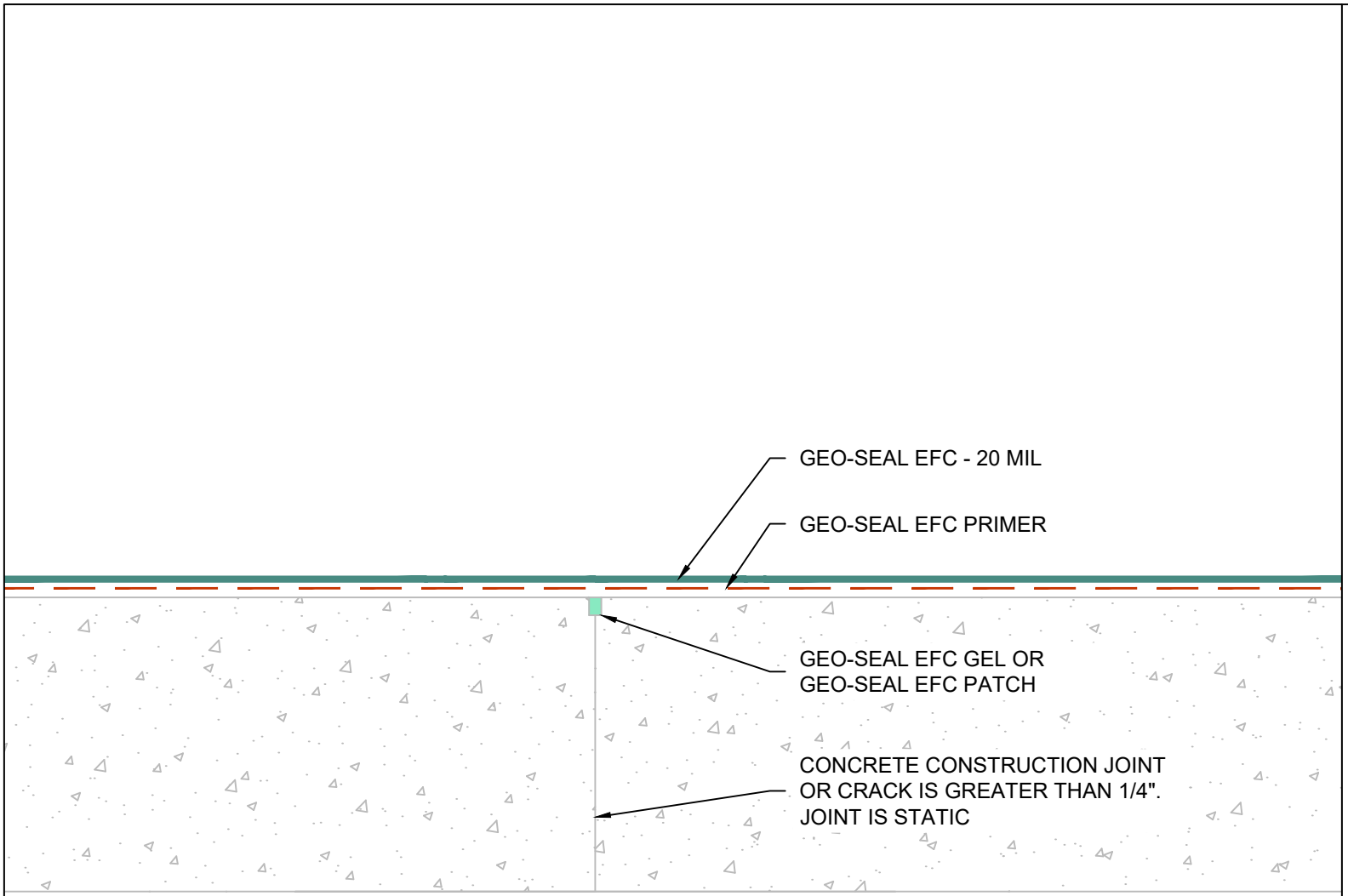

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Geo-Seal® Vapor Intrusion Barrier

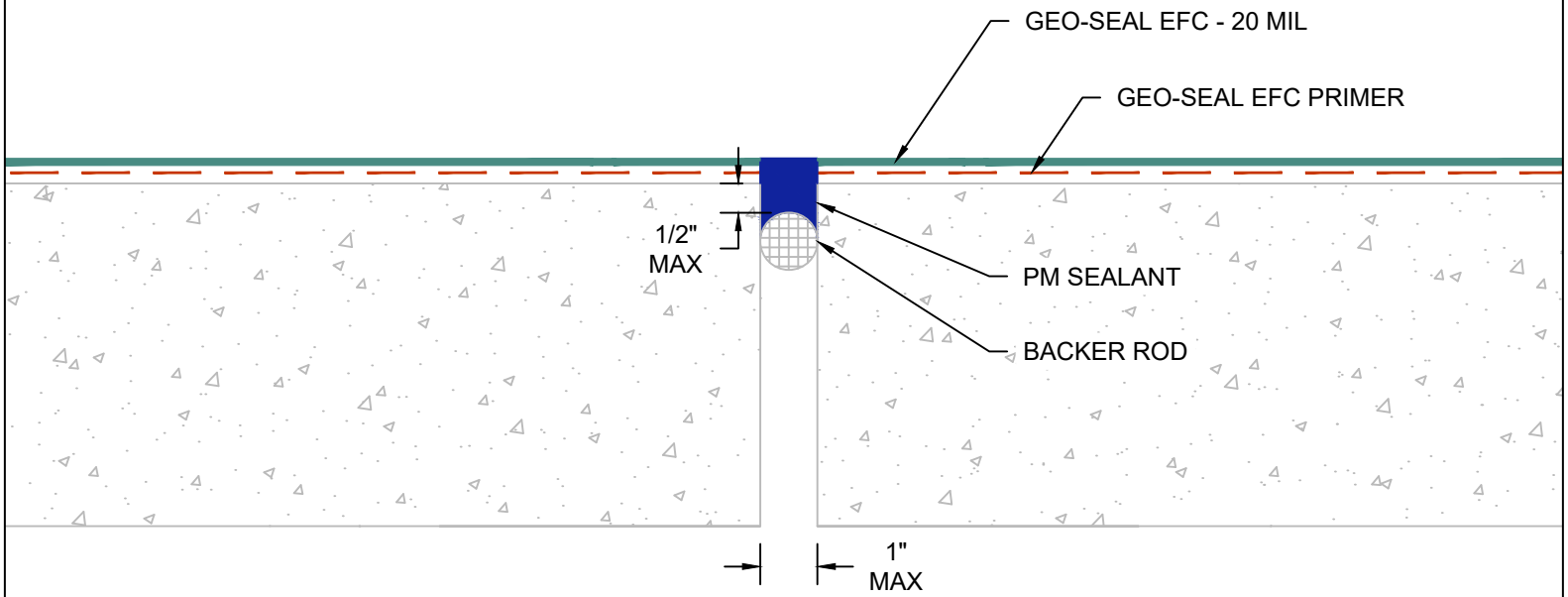
DRAWIMG NUMBER
60.011.0

SYSTEM NAME
GEO-SEAL EFC

SYSTEM DESCRIPTION
CRACK WITHOUT MOVEMENT REPAIR

DATE
12/08/2021

DRAWN BY	SCALE
RJT	NTS



NOTES:
1. JOINT MOVEMENT NO MORE THAN 1/4".
2. DO NOT EXTEND GEO-SEAL EFC OVER JOINT SEALANT.

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epro
1328 E. KELLOGG DRIVE
WICHITA, KS 67211
1-800-882-1896
EPROINC.COM

Geo-Seal® Vapor Intrusion Barrier

DRAWIMG NUMBER
60.012.0

SYSTEM NAME
GEO-SEAL EFC

SYSTEM DESCRIPTION
EXPANSION JOINT

DATE
12/08/2021

DRAWN BY	SCALE
RJT	NTS

Land Science
a division of REGENESIS

Retro-Coat®
Vapor Intrusion Coating

TECHNICAL DATA SHEET

SCOPE

Product and Application
This specification describes the application of the Retro-Coat® System. The minimum thickness of the system is between 26-30 mils, including a 20 mil minimum application of Retro-Coat.

Key Benefits

- Designed specifically to mitigate vapor intrusion in existing structures
- Retro-Coat is a wearing surface, meaning no additional concrete protection is necessary
- No odor and fast cure time reduce building downtime
- Carpet, tile, linoleum or other floor coverings can be applied directly over Retro-Coat, if desired
- Retro-Coat can increase the performance of an existing active sub-slab depressurization system
- Retro-Coat can aid in the retiring of existing active systems
- Available and installed by Land Science Technologies certified contractors

Acceptable Manufacturers
Retro-Coat as manufactured by Land Science San Clemente, CA.

Applicator
Applicator must be a certified contractor of Land Science.

Performance Criteria
Retro-Coat as manufactured by Land Science San Clemente, CA.

Diffusion Coeffcient PCE: TCE:	(Columbia Labs) 7.6×10^{-14} m²/s 8.2×10^{-14} m²/s
Tensile Strength Minimum:	ASTM D-638 9,800 PSI
Tensile Elongation Minimum:	ASTM D-638 6%
Flexural Strength Minimum:	ASTM D-790 7,035 PSI
Hardness, Shore D Maximum:	ASTM D-2240 83
Gardner Impact Minimum:	ASTM D-2794 80 inch-pounds
Bond Strength Minimum:	(to quarry tile) 1,000 PSI
Vapor Transmission Rate Maximum:	ASTM E-96 0.07 perms
Water Absorption Maximum:	ASTM D-570 0.02% in 24 hours
60° Gloss Minimum:	 100

Materials
Retro-Coat “A” shall be a modified epoxy containing special flexibilizers and specially formulated resins for superior chemical resistance and enhanced resilience. No solvents are allowed.

Retro-Coat “B” shall be customized blend of hardeners specifically formulated to maximize chemical resistance.

APPLICATION

Surface Preparation

All existing surfaces that will be covered with the systems specified herein should be mechanically ground, shot blasted or sand blasted to yield a minimum 60 grit surface texture. All loosely adhered coatings will be removed. Any grease and other contaminants found on the concrete must also be removed.

All open cracks 1/2" and greater should be v-notched to a 3/4" width by 1/2" depth and cleaned of any debris. Such cracks should be filled with Retro-Coat Gel and struck off flush with the surrounding surface.

Cut back and/or remove any expansion joint backing or filler strips to a minimum of 1 ½" deep. Insert disposable filler in the joints to prevent filling with the overlayment materials and to allow for accurate location of final saw cuts in the overlayment.

Material Application

Retro-Coat 2-Part Caulk

Apply Retro-Coat 2-Part Caulk around the base of all pipe penetrations making sure to fill any gap between the penetration and concrete slab

Apply Retro-Coat 2-Part Caulk to the joint created between horizontal and vertical transitions. The caulking material should be applied and pressed into the joint filling any gaps that might be present.

Retro-Coat PRIMER

Apply Retro-Coat PRIMER to all areas at a thickness of 6 mil and allow to dry tack free. In areas where the concrete surface is in need of slight repair or needs to be leveled, a slurry form of Retro-Coat PRIMER called Retro-Coat PRIMER-S can be applied with a flat squeegee. Retro-Coat PRIMER-S is self priming and does not need to be primed again.

Completed surface preparation consisting of shot blasting, Retro-Coat PREP, to fill joints and cracks and a 6 mil application of Retro-Coat PRIMER

APPLICATION

Retro-Coat
Mix Retro-Coat, Part A with a low-speed (<750 rpm) jiffy-style mixer for about 30 seconds, or until uniform in color, then mix in Retro-Coat Coating, Part B for another 30-60 seconds.

Dump contents onto floor in a ribbon pattern, squeegee, and then back roll at a coverage rate of 160 SF/gallon to achieve a film thickness of 10 mils.

Apply second coat 10 mil coat to achieve a total thickness of 20 mils. Repeat as necessary to achieve specified thickness.

If a flooring material will be placed over Retro-Coat after it is applied, or appearance is not a priority, (1) 20 mil coat can be applied.

Retro-Coat TOP WB
Retro-Coat TOP WB can be installed for aesthetic purposes to protect the Retro-Coat system from ambering or color fading due to fluorescent and UV light exposure.

Apply Retro-Coat TOP WB in two (2) 7-8 wet mil coats to achieve 7-8 dry mils.

Protection of Finished Work

Prohibit foot traffic on floor for 24 hours after laying (at 70°F). At 50°F, this time should be extended to 48 hours.

Rinse off any chemicals that may come in contact within 7 days of installation with the freshly laid floor immediately.

Application of Retro-Coat SEALANT to a 20 mil total thickness

Cleanup

Properly dispose of all unused and waste materials.

Tools can be washed in warm, soapy water when wet, but after drying, can only be cleaned by grinding or with a paint stripper.

Unused resin can be set off with proper amount of hardener and disposed of in regular trash bins.

QUALITY CONTROL

Warranty

Land Science warrants Retro-Coat to be free from defects for a period of one (1) year from the date when applied in accordance to Land Science's directions for application.

Bond failure, peeling or delamination due to water or moisture intrusion through the slab substrate will not be covered, nor will any defects to the Retro-Coat layer caused by osmotic vapor blistering.

Due to uncontrolled color tinting from each color batch, colors, textures, patterns, and shading may vary from job to job and throughout larger areas. Color and texture samples used by Land Science are approximate only and may vary from the completed project.

Any damage to the coating that is caused by movement of the underlying substrate (i.e., concrete, joint material or other such underlayment), such as concrete cracking, movement of concrete, and joints expanding, will not be covered by the warranty. Additionally, some tires may leave an amber colored tire tread mark impregnated into the top layer, this is not covered under the warranty.

Any repairs and/or corrections will be for the defective area only, unless deemed otherwise by Land Science. Due to the custom nature of Land Science coatings, any repairs and or corrections may not match the original work. Land Science will not re-install a brand new flooring system to the entire floor due to colors, gloss or sheen difference, texture difference and/or chips not matching.

Resinous coatings are odorous; we recommend turning off air handlers prior to installation. We hold no liability for these chemical odors.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND THE REMEDY PERMITTED HEREIN SHALL BE THE EXCLUSIVE REMEDY OF THE BUYER. SELLER'S LIABILITY SHALL BE LIMITED TO REPLACEMENT OF DEFECTIVE MATERIAL. IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL, PUNITIVE, CONSEQUENTIAL OR INCIDENTAL DAMAGES. THIS PARAGRAPH IS NOT APPLICABLE IN CONSUMER TRANSACTION OR WHERE PROHIBITED BY LAW.

Quality Control

Installer shall use a notched squeegee to apply Retro-Coat to the specified mil thickness and calculations shall be done to determine if the correct amount of material has been applied. Retro-Coat contains 100% solids at the time of application; therefore no material shrinkage will occur during the curing process. One gallon will cover 80 square feet.

A wet mil film gauge can be used to spot check the Retro-Coat thickness to make certain the minimum 20 mil thickness has been applied, though some discretion should be used because high points or low points on the underlying surface can adversely affect the thickness measurements.

Floor Care

The standard smooth surface of Retro-Coat should be cleaned on a regular basis by damp mopping the floor with conventional commercial cleaners. It is important to first remove any grease or oils by a suitable cleaner, preferably a citrus based cleaner. Rinse with clear water to help eliminate film buildup and then allow to dry.

⚠ ***Never use abrasive powder cleaners like Ajax or Comet as they tend to scratch the floor.***

- Additional steps can also be taken to prolong the look and life of a seamless floor:
- Protect the floor during transference of heavy equipment
- Educate the drivers inside the building of the importance of avoiding “jack-rabbit” starts and stops, as well as keeping the metal forks lifted
- Regular cleaning should take place as to not allow the buildup of abrasive material, such as sand or dirt, on the coating
- Eliminate all metal wheels
- Change over to light-colored polyurethane wheels
- Do not slide heavy metal totes, drums or bins across the floor
- Immediately hose down chemical spills, especially on newly laid floors.

APPENDIX D

QUALIFICATIONS OF CONCLUSIONS

QUALIFICATIONS OF CONCLUSIONS

The findings and opinions presented are relative to the dates of our site work and should not be relied on to represent conditions at substantially later dates or locations not investigated.

The opinions included herein are based on information obtained during the study and our experience. If additional information becomes available which might impact our environmental conclusions, we request the opportunity to review the information, reassess the potential concerns and modify our opinions, if necessary.

Assessments may include interviews, a review of documents prepared by others or other secondary information sources. NOVA has not verified the provided information and has no responsibility for the accuracy or completeness of the information.

Although this assessment has attempted to identify the potential for environmental impacts to the subject property, potential sources of contamination may have escaped detection due to: (1) the limited scope of this assessment, (2) the inaccuracy of public records, (3) the presence of undetected or unreported environmental incidents, (4) inaccessible areas and/or (5) deliberate concealment of detrimental information. It was not the purpose of this study to determine the actual presence, degree or extent of contamination at the site, except as specifically described in the previous sections of this report. This would require additional exploratory work, including supplemental sampling and laboratory analysis.

This report is intended for the sole use of ***American Deli International Inc***. The scope of work performed during this study was developed for purposes specifically intended by ***American Deli International Inc***. and may not satisfy other user requirements. Use of this report or the findings and conclusions by others will be at the sole risk of the user.

Our professional services have been performed, our findings obtained, our conclusions derived and our recommendations prepared in accordance with generally accepted engineering practices and principles. This statement is in lieu of all other statements or warranties, either expressed or implied.