HYDRO ANALYSIS, INC.
Environmental & Water Resources Engineering
Groundwater Consultants

May 9, 2013

Elyse Heilshorn
City & County of San Francisco
Environmental Health Section
1390 Market Street, Suite 210
San Francisco, CA 94102

Re: 490 S. Van Ness Ave, San Francisco, CA

Dear Ms. Heilshorn:

On behalf of JCN Developers, LLC, please find herewith the "*Site Mitigation Plan, JCN Developers, LLC,490 South Van Ness, San Francisco, CA*" by Hydro Analysis, Inc., dated May 9, 2013.

If you have any questions or require additional information, please call me at (510)620-0891 or e-mail at gary@hydroanalysis.com.

Sincerely,

Gary Aguilar
Principal Engineer

11100 SAN PABLO AVE., SUITE 209, EL CERRITO, CALIFORNIA 94530 • TEL 510-620-0891 • FAX 510-620-0894
www.HydroAnalysis.com

HYDRO ANALYSIS, INC.
Environmental & Water Resources Engineering
Groundwater Consultants

SITE MITIGATION PLAN

JCN DEVELOPERS, LLC

490 South Van Ness Avenue
San Francisco, California

May 9, 2013

11100 SAN PABLO AVE., SUITE 209, EL CERRITO, CALIFORNIA 94530 • TEL 510-620-0891 • FAX 510-620-0894
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I. INRODUCTION

On behalf of JCN Developers, LLC, we are providing this Site Mitigation Plan. The subject site is the former Quality Tune-Up facility located at 490 South Van Ness Avenue in San Francisco, California. The location of the site is shown in Figure 1.

Previous Site Work and LUFT Case Closure

Following an extensive soil excavation project that was undertaken between January 2012, and March 2012, the LUFT Case at the subject site was closed on March 21, 2013. A detailed description of the project is provided in the "*Report of Environmental Corrective Action, Quality Tune-Up, 490 South Van Ness, San Francisco, CA*" by Hydro Analysis, Inc., dated June 14, 2012.

The goal of the previous corrective action was to physically remove subsurface contamination by the excavation of contaminated soil, along with the extraction of a significant amount of contaminated shallow groundwater. The corrective action was part of an effort to expedite LUFT Case closure and to facilitate the timely construction of a residential development on the property by JCN Developers, LLC. The full extent of soil over-excavation is shown in Figure 2. Most of the excavation reached a depth of between 12 and 16 feet below ground surface.

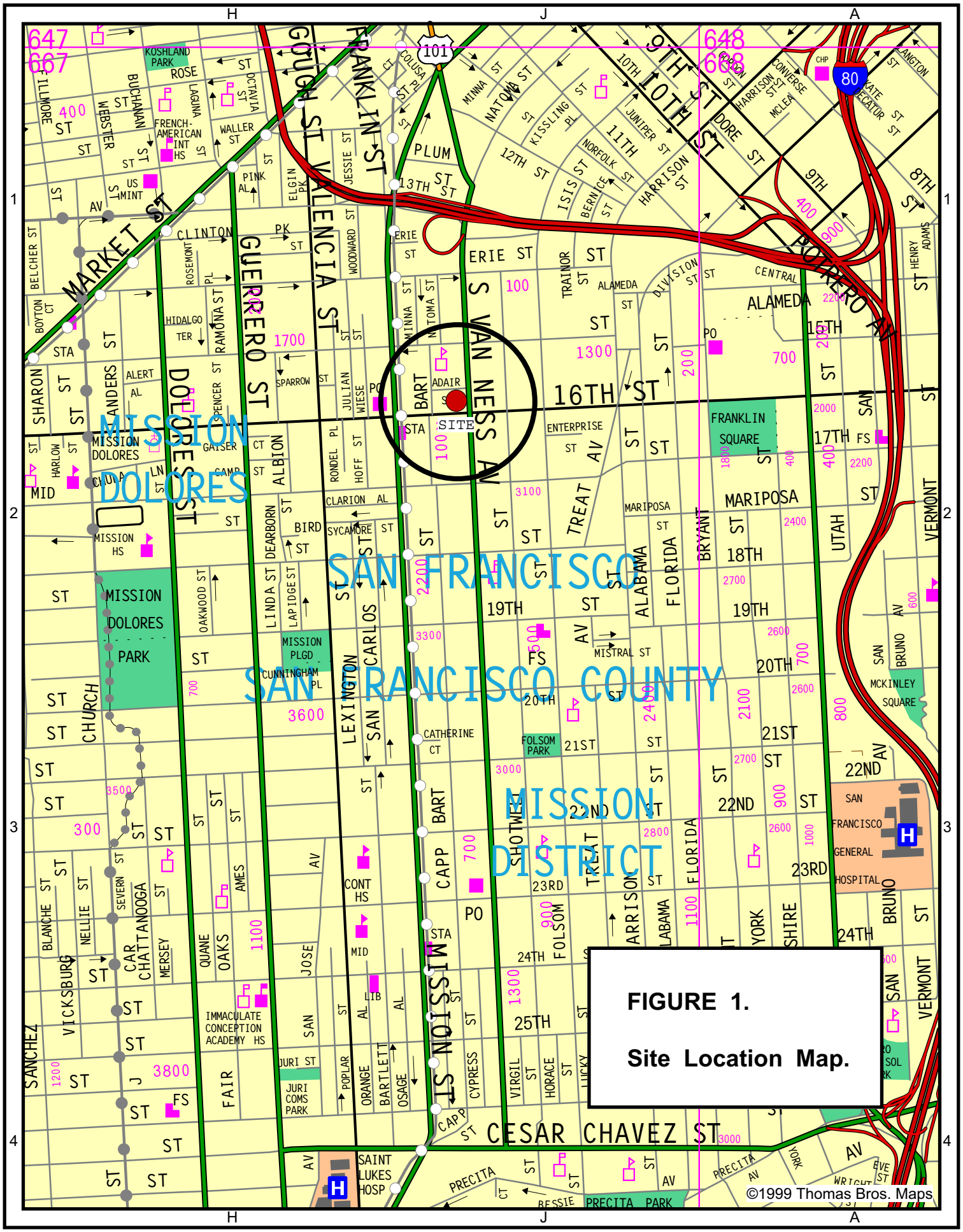


FIGURE 1.

Site Location Map.

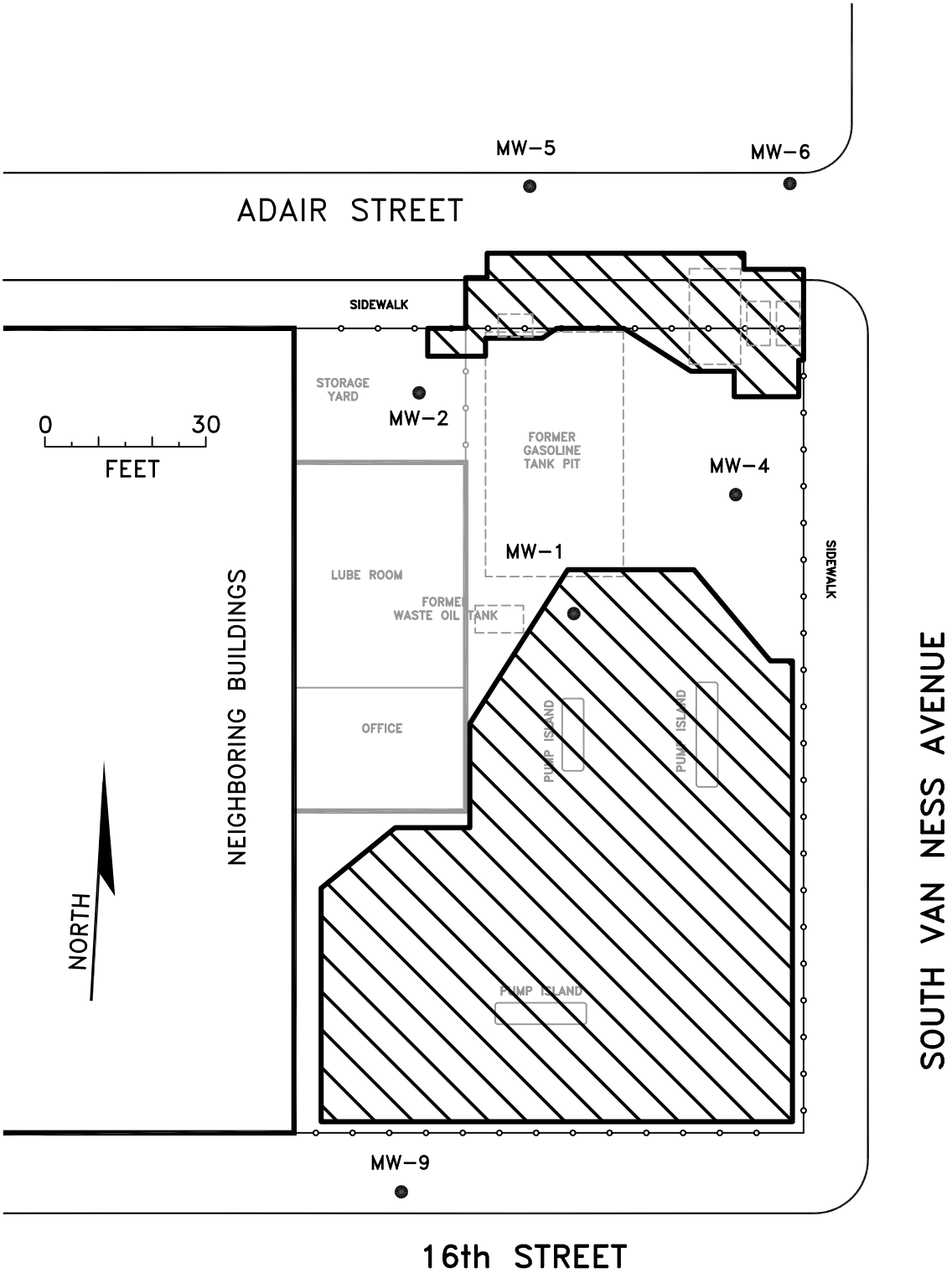


FIGURE 2.

Extent of
Previous Excavation.

Proposed Soil Excavation

The proposed land development involves the complete excavation of the property down to a depth of 15 feet below street grade. The sidewalls of the excavation will be retained by soldier beams and timber lagging. The adjacent buildings will be underpinned in accordance with a design that will be approved by San Francisco Bureau of Building Inspection (BBI). The full extent of the proposed excavation is shown in Figure 3.

Within areas of the site that were temporarily backfilled during the previous remediation project, the excavated material will consist of 1) 4"-minus crushed recycled concrete, 2) sand and 3) lean Portland cement concrete mix. This material should be suitable for immediate load-out and transport to a construction material recycling facility.

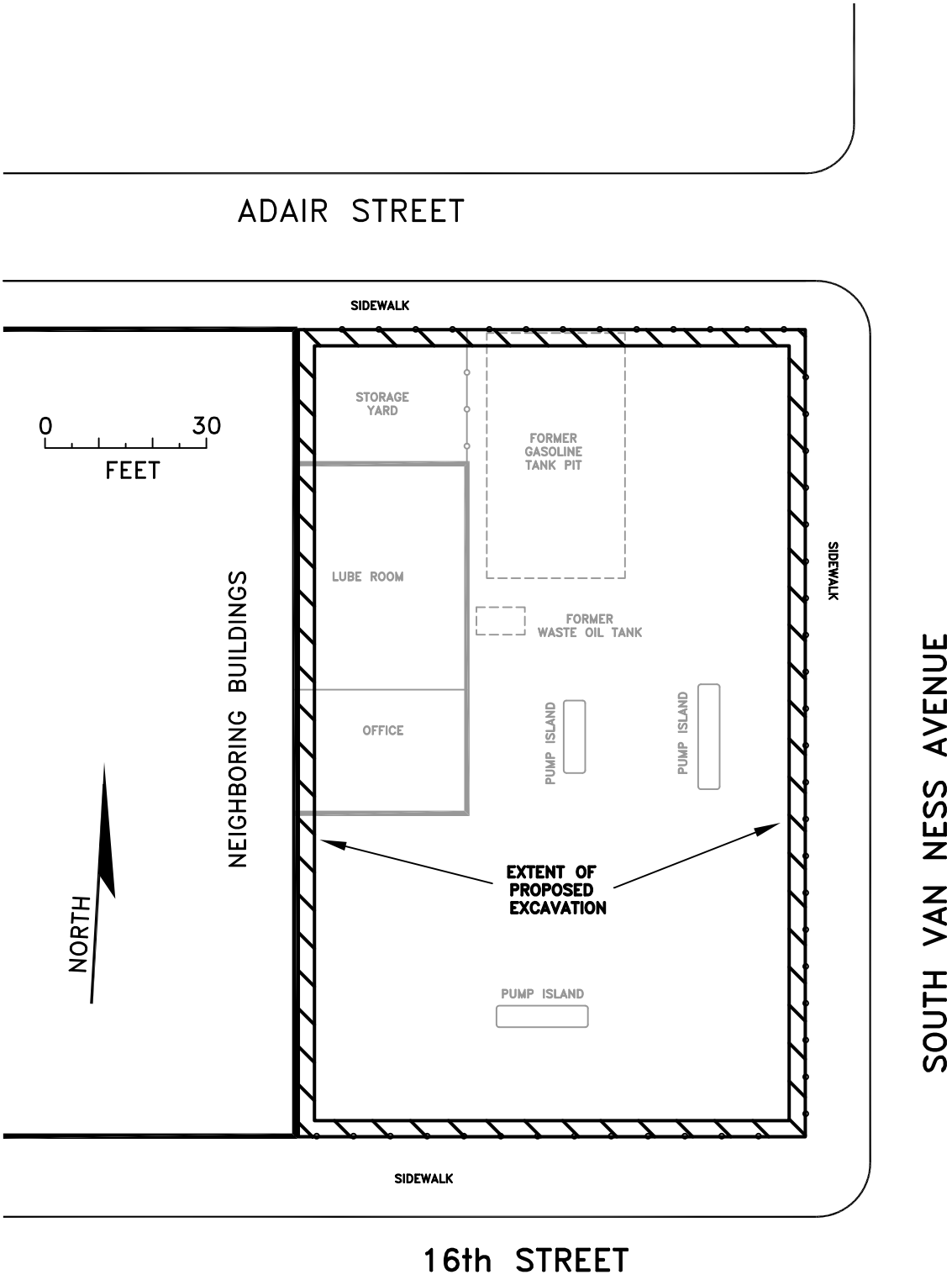


FIGURE 3.

Extent of
Proposed Excavation.

II. CONTAMINATED SOIL PROCEDURES

Previous excavation work has resulted in the removal of nearly all subsurface contamination from the site. However, some localized areas of contamination are known to exist. These locations are indicated in Figure 4 and are discussed below. For reference, confirmation petroleum hydrocarbon concentrations from the previous remediation project are provided in Attachment A.

Street Sidewalls Elevated petroleum hydrocarbon concentrations still remain localized in the soil where over-excavation became impractical due to the location of existing sidewalks and streets. Specifically, elevated concentrations of petroleum hydrocarbons still exist in the excavation sidewalls along South Van Ness Avenue and along 16th Street, adjacent to the previous pump island. If additional excavation of native soil is required at these locations, the excavated soil will be segregated, stockpiled and profiled by laboratory analysis.

Pump Islands The pump islands and canopies were shored up and preserved during the previous excavation project. Consequently, there is a quantity of contaminated soil present directly beneath the footprint of each pump island that was not removed. During the excavation, this soil will be segregated, stockpiled and profiled by laboratory analysis.

Building Subsurface Based upon previous subsurface investigation, elevated concentrations of lead are present in the near-surface soils beneath the existing building footprint. All material excavated down to a depth of 3 feet in this area will be segregated, stockpiled and profiled by laboratory analysis.

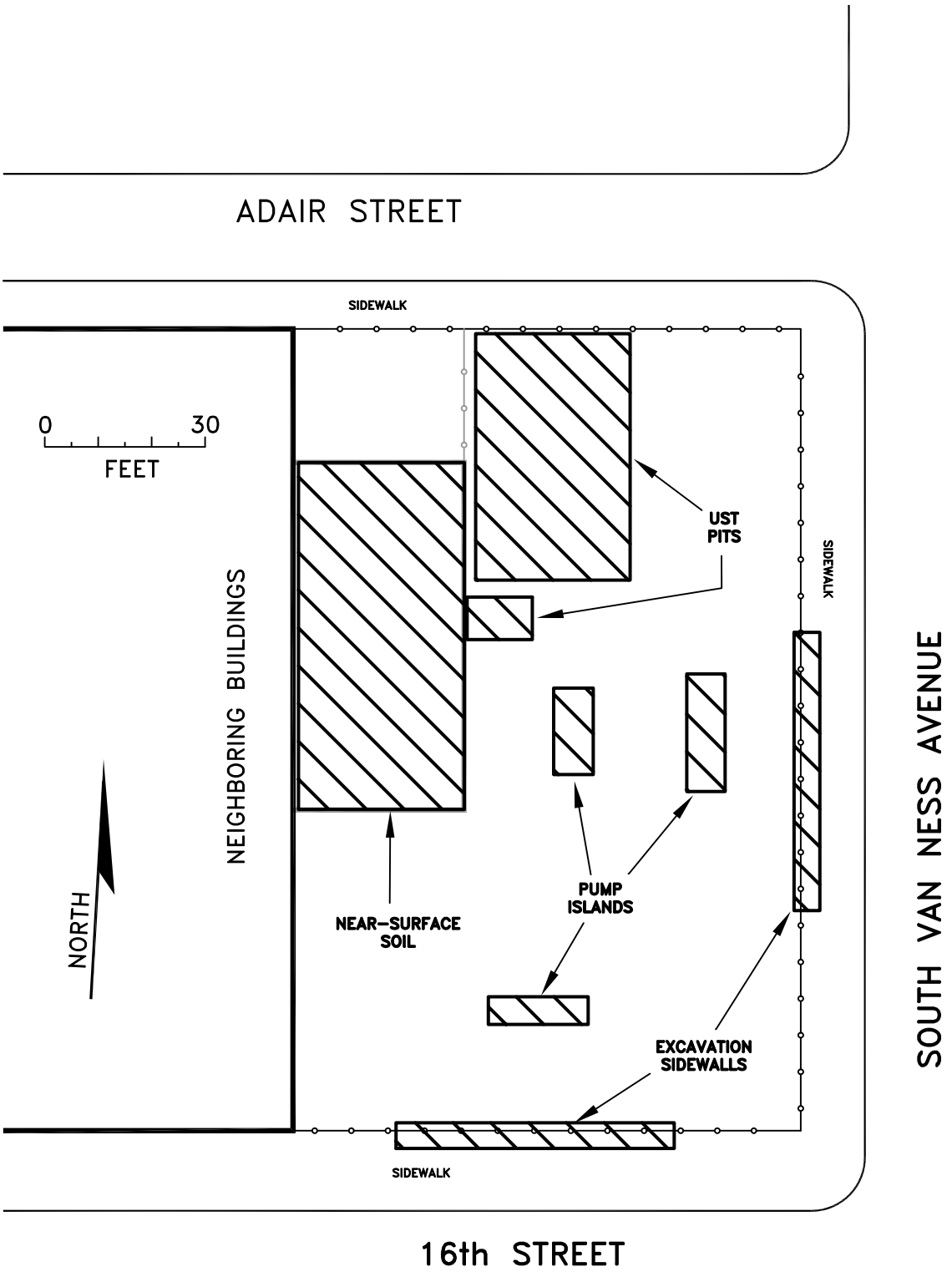


FIGURE 4.

Areas of Potential Contamination

Previous Tank Pits The proposed excavation will include the removal of the backfill material from the two on-site tank pits that were the locations of three underground gasoline storage tanks and one underground waste oil storage tank. Based upon observations made during the previous excavation project, the backfill material consists of loose sub-angular gravel. The presence of dissolved gasoline in water that had accumulated within the larger tank pit was noted. Following proper stockpiling, draining and drying, it is likely that this gravel will be suitable for transport to a construction material recycling facility.

Native Soil As the excavation progresses into native soil on the remaining portions of the property, soil will be carefully monitored by the field engineer for apparent petroleum hydrocarbon contamination. The presence of petroleum hydrocarbon contamination can easily by detected using a portable organic vapor meter (OVM). In addition, it has been noted from previous work at the site that the natural brown color of the native soil appears as olive-gray color when significant petroleum hydrocarbon concentrations are present. Any soil that is suspect of being contaminated with petroleum hydrocarbons will be segregated, stockpiled and profiled by laboratory analysis.

Soil Disposal

All excavated soil that is suspected of being contaminated will be stockpiled on-site. Based upon field OVM readings and physical observations, soil will be segregated into appropriate soil stockpiles according to expected waste profile concentrations. The soil suspected of containing elevated lead concentrations will be stockpiled separately. Upon profiling by sampling and laboratory analysis, the excavated soil will be transported by a licensed transporter under manifest to an appropriate disposal facility. After initial waste profiling, it may be possible to establish a wastestream to a particular landfill. This would preclude the necessity for further stockpiling and allow direct load-out of excavated soil.

We expect that all of the petroleum-contaminated soil will be appropriate for disposal as a Special Waste at a Bay Area Class II or Class III solid waste landfill. Lead-contaminated soil may require disposal as a Class I hazardous Waste. The landfills that will be utilized for this project are listed in Table 1.

TABLE 1.

Class I Hazardous Waste

Clean Harbors Buttonwillow, LLC
Buttonwillow Landfill
EPA ID: CAD980675276
2500 West Lokern Road
Buttonwillow, CA 93206
(661) 762-6200

Class II High-Level Petroleum Hydrocarbons

Republic Services, Inc.
Keller Canyon Landfill
901 Bailey Road
Pittsburg, CA 94565
(925) 458-9800

Class III Low-Level Petroleum Hydrocarbons

Waste Management, Inc.
Altamont Landfill
10840 Altamont Pass Road
Livermore, CA 94551
(925) 455-7300

BFI
Ox Mountain Landfill
12310 San Mateo Road
Half Moon Bay, CA 94019
(650)726-1819

Laboratory Analysis

Laboratory analysis of soil samples will be conducted by a California State DOHS certified in accordance with EPA recommended procedures.

At a minimum, soil samples will be analyzed for:

1) Total Petroleum Hydrocarbons as Gasoline (EPA method 8260B)
2) Benzene, Toluene, Ethylbenzene, Total Xylenes (EPA method 8260B)
3) MTBE (EPA method 8260B)
4) Total Extractable Petroleum Hydrocarbons as Diesel & Motor Oil (EPA method 8015B)
5) Cadmium, Chromium, Lead, Nickel, Zinc (LUFT metals) (EPA method 6010B)

Additional laboratory analyses may be required for waste profiling purposes, in accordance with the requirements of the appropriate landfill, recycling facility or TSD facility. For the lead-contaminated soil, the following additional analyses will be required:

1) TCLP (soluble) Lead
   (sample prep by EPA method 1311, analysis by EPA method 6010B)
2) Reactivity, Corrosivity, Ignitability (RCI)
   (CA Title 22)

III. GROUNDWATER REMOVAL

Due to the presence of relatively shallow groundwater, we expect that dewatering will be necessary to complete the soil excavation activities. As a result of the previous soil excavation work, four temporary dewatering casings currently exist at the site. For the proposed excavation, additional perimeter dewatering casings will be installed. In order to discharge wastewater to the combined sewer system during the previous excavation project, Permit #11-12189 was obtained from the San Francisco PUC on December 21, 2011. The permit is currently active.

During the proposed excavation project, groundwater will be extracted, as necessary, from the various dewatering casings using electric submersible pumps. The water will be collected on-site in a baffled open-top settling tank. Periodically, the clarified wastewater will be discharged by gravity flow through a totalizing meter and into the on-site storm drain catch basin located at the corner of Adair Street and South Van Ness.

IV. NUISANCE ABATEMENT

Dust Control During the previous contamination remediation project that involved extensive on-site soil excavation, dust control was never a problem. We propose to use the same Granite Excavation Dust Control Plan for the current excavation project. The major components of the plan are 1) water spraying, 2) soil covering and 3) particulate monitoring. A copy of the plan is provided in Attachment B.

Odor Control The majority of the petroleum hydrocarbon contamination has already been removed from the site. However, in order to insure that no odor problems arise during the soil excavation work, water misting equipment will be kept on-site and will be mobilized in the event that any significant odors are detected from the excavation. In order to further minimize hydrocarbon odors and possible nuisance to neighboring building occupants and nearby pedestrian traffic, stockpiled soil will be covered as quickly as possible during the soil excavation operation. In addition, all trucks will immediately be tarped upon completion of loading.

V. CONFIRMATION SAMPLING

In the areas where samples were not previous collected during the recent contamination remediation project, soil samples will be collected from the excavation bottom and from the final extent of the excavation sidewalls. Since shoring will be placed as the excavation progresses, the sidewall samples will be collected during the course of the excavation.

Laboratory Analysis

Laboratory analysis of soil samples will be conducted by a California State DOHS certified in accordance with EPA recommended procedures.

Confirmation soil samples will be analyzed for:

1) Total Petroleum Hydrocarbons as Gasoline (EPA method 8260B)
2) Benzene, Toluene, Ethylbenzene, Total Xylenes (EPA method 8260B)
3) MTBE (EPA method 8260B)
4) Total Extractable Petroleum Hydrocarbons as Diesel & Motor Oil (EPA method 8015B)
5) Cadmium, Chromium, Lead, Nickel, Zinc (LUFT metals) (EPA method 6010B)

VI. UNDERGROUND STORAGE TANKS

In the event that an underground storage tank is encountered during the course of the proposed excavation work, further excavation at that location will be stopped and the SFDPH will be contacted immediately. After an assessment of the size and condition of the tank, a tank removal permit will be obtained from the SFDPH and the tank will be removed before the excavation continues. The tank removal will follow all required protocol, including agency inspection, tank inerting, tank disposal and collection of confirmation soil samples.

VII. SITE SAFETY PLAN

A set of site-specific health and safety operating procedures for Granite Excavation & Demolition is provided in Attachment C. In order to maintain a safe working environment for field personnel, a copy of these operating procedures will be kept on-site during the field operations, and will be followed in accordance with the magnitude of any contamination encountered.

All additional on-site contractors shall maintain their own site safety protocol in order to maintain OSHA compliance for all workers.

VIII. ENGINEERED CONTROL OF VAPOR INTRUSION

Elevated petroleum hydrocarbon concentrations remained localized in the soil where previous over-excavation became impractical due to the location of existing sidewalks and streets. At the time of future residential development of the property, elevated concentrations of petroleum hydrocarbons may still exist in the excavation sidewalls along South Van Ness Avenue and along 16th Street. The results of a Tier 1 Risk Assessment was presented in the "*Site Conceptual Model, 490 South Van Ness Avenue, San Francisco, California*" by Hydro Analysis, Inc., dated December 6, 2012. The risk assessment compared the highest petroleum hydrocarbon concentrations still present in the soil with the Environmental Screening Levels (ESL's), as set forth in the report titled "*Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final*" by the California Regional Water Quality Control Board, San Francisco Bay Region, November 2007. Based upon the risk assessment, there are some areas where the soil ESL's are exceeded. Consequently, the potential for intrusion of hydrocarbon vapors into the residential living spaces of the future building must be considered.

Mechanism for Vapor Intrusion

Upon completion of the proposed final excavation, no petroleum hydrocarbons will be present under the footprint of the future building. Any migration of hydrocarbon vapors into the residential living spaces of the future building will require that the vapors first accumulate inside the underground parking garage.

Elevated petroleum hydrocarbon concentrations remained localized in the soil where previous over-excavation became impractical due to the location of existing sidewalks and streets. Specifically, elevated concentrations of petroleum hydrocarbons may still exist in the excavation sidewalls along South Van Ness Avenue and along 16th Street, adjacent to the previous pump island. Inspection of the confirmation soil sampling data indicates that elevated concentrations of petroleum hydrocarbons in the soil exist at depths of greater than 7 feet below street grade. Since the shallow water table at the site is on the order of 3 to 5 feet below street grade, any residual soil contamination is within the saturated zone. By this reasoning, it can be concluded that the mechanism for vapor migration into the underground parking garage is the volatilization of petroleum hydrocarbons from any contaminated groundwater that may potentially seep into the space.

Placement of Moisture Barrier

We have concluded that the mechanism for vapor migration into the underground parking garage is the volatilization of petroleum hydrocarbons from any contaminated groundwater that may potentially seep into the space. Eliminating groundwater seepage into the underground parking garage will eliminate the potential for vapor intrusion into the residential living spaces. A water-proof membrane will be placed throughout the construction of the below-grade foundation and the underground parking garage. The proper application of appropriate membrane products will eliminate the intrusion of any moisture into the below-grade portion of the building. JCN Developers plans to utilize several products manufactured by Epro Waterproofing Systems, Inc. Epro has reviewed the highest expected groundwater concentrations for the site and has certified that the design membrane will be suitable. The letter from Epro Waterproofing Systems, Inc., dated April 29, 2013, and product data sheets are provided in Attachment D.

Mechanical Ventilation System

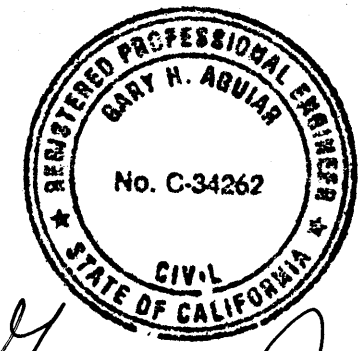
The proposed multi-unit residential development will include an underground parking garage. In accordance with California Mechanical Code, 2010 CMC, Section 403.8, the underground parking garage will have a mechanical ventilation system that will be in operation 24/7 at a design flowrate of 0.75 CFM/SF. A statement by MHC Engineers regarding the ventilation design criteria is provided in Attachment E.

We do not expect any vapor intrusion into the underground parking garage if the water-proof membrane is properly placed. However, the presence of the mechanical ventilation system will add an additional tier of safety to the overall building design. With the ventilation system operating 24/7, the accumulation of vapors in the underground parking garage seems highly unlikely.

SITE MITIGATION PLAN

490 South Van Ness, San Francisco, California

May 9, 2013



EXP. 9-30-2013

Gary Aguiar **RCE 34262**

ATTACHMENT A

Previous Excavation Sampling

NORTH

GASOLINE

SOUTH VAN NESS AVENUE

ADAIR STREET

16th STREET

SIDEWALK

FORMER GASOLINE TANK PIT

FORMER WASTE OIL TANK

LUBE ROOM

OFFICE

STORAGE YARD

PUMP ISLAND

PUMP ISLAND

MW-1

MW-2

MW-4

MW-5

MW-6

MW-9

A

B

C

D

BS-A

BS-B

BS-D

BS-F

BS-J

BS-K

BS-L

BS-N

BS-P

BS-Q

BS-R

BS-S

BS-T

SW-R

SW-L

SW-G

SW-F

SW-K

SW-J

SW-P

SW-Q

SW-T

13' – ND<0.25

7' – **2.8**
9' – ND<25

7' – **68**
13' – **3,100**
16' – **2,300**

12' – **7.6**

17' – **2,400**

6' – ND<0.25
11' – **0.50**

13' – ND<0.25

6' – **0.61**
13' – ND<0.25

8' – ND<0.24

3' – ND<0.24
6' – **4.2**

14' – ND<0.25

8' – ND<0.25
10.5' – ND<0.25

5' – **260**
11' – **22**

12.5' – ND<0.25

13' – ND<0.25

7' – ND<0.25
10' – **2,600**

12.5' – **0.58**

13.5' – ND<0.24

8' – ND<0.25

14' – ND<0.25

3' – ND<0.25
6' – **18**

3' – ND<0.25
6.5' – ND<0.25

6' – **360**
11' – ND<0.25
15' – ND<0.25

5' – ND<0.25
9' – ND<0.25

11' – ND<0.25

5' – **0.68**
8' – **5.5**

12' – ND<0.25

0 30
FEET

Concentrations of TPH-gas in Soil Samples Collected at Various Depths.

concentrations in mg/kg (ppm)

depths in feet below ground surface

BENZENE

NORTH

13' – ND<0.005

7' – **0.013**
9' – **0.066**

7' – ND<0.47
13' – **9.2**
16' – ND<5

12' – ND<0.021

17' – ND<5

6' – ND<0.005
11' – **0.011**

8' – ND<0.049

13' – ND<0.0049

3' – ND<0.0048
6' – ND<0.0049

6' – **0.14**
13' – **0.0082**

14' – ND<0.0049

8' – ND<0.005
10.5' – **0.0084**

5' – ND<0.5
11' – ND<0.025

12.5' – ND<0.005

13' – ND<0.0049

12.5' – **0.0056**

7' – ND<0.005
10' – **6.8**

8' – ND<0.005

13.5' – ND<0.0049

14' – ND<0.005

3' – ND<0.005
6' – ND<0.024

3' – ND<0.005
6.5' – ND<0.0049

6' – ND<0.0049
11' – **0.021**
15' – ND<0.0051

5' – ND<0.005
9' – ND<0.005

11' – ND<0.005

5' – **0.062**
8' – **0.26**

12' – ND<0.005

SOUTH VAN NESS AVENUE

ADAIR STREET

16th STREET

SIDEWALK

FORMER GASOLINE TANK PIT

FORMER WASTE OIL TANK

LUBE ROOM

OFFICE

STORAGE YARD

PUMP ISLAND

MW-1
MW-2
MW-4
MW-5
MW-6
MW-9

SW-R
SW-L
SW-G
SW-F
SW-S
SW-T
SW-P
SW-K
SW-J

BS-R
BS-S
BS-T
BS-N
BS-Q
BS-P
BS-K
BS-J
BS-L
BS-D
BS-B
BS-A
BS-F

A
B
C
D

0 30
FEET

Concentrations of Benzene in Soil Samples Collected at Various Depths.

concentrations in mg/kg (ppm)

depths in feet below ground surface

NORTH

GASOLINE

16' – ND<0.25

6' – ND<0.24
10' – ND<0.25
12' – ND<0.25

3' – ND<0.25
7' – **750**
11' – **1.5**

3' – ND<0.24
6' – ND<0.24
13' – ND<0.24

9' – **730**
12' – **3,300**

3' – ND<0.25
6' – ND<0.24
9' – ND<0.25
12' – **0.40**

15' – **0.49**

SOUTH VAN NESS AVENUE

3' – ND<0.25
7' – **96**
11' – **0.27**
16' – ND<0.25

3' – **1.1**
9' – ND<0.24
15' – ND<0.25

3' – ND<0.25
6' – **160**
9' – **0.91**
14' – **0.33**

3' – ND<0.24
5' – **340**
9' – **35**
15' – ND<0.25

3' – **4.8**
5' – **310**
9' – **820**

6' – ND<0.25
10' – **1.5**

AD-88
AD-E
AD-8S
AD-8
AD-6
AD-2
AD-5
AD-S
AD-5S
AD-1
AD-3
AD-W
AD-9
MW-6
MW-4
MW-1
MW-5
MW-2
MW-9
SIDEWALK
PUMP ISLAND
FORMER GASOLINE TANK PIT
FORMER WASTE OIL TANK
LUBE ROOM
OFFICE
STORAGE YARD
ADAIR STREET
16th STREET

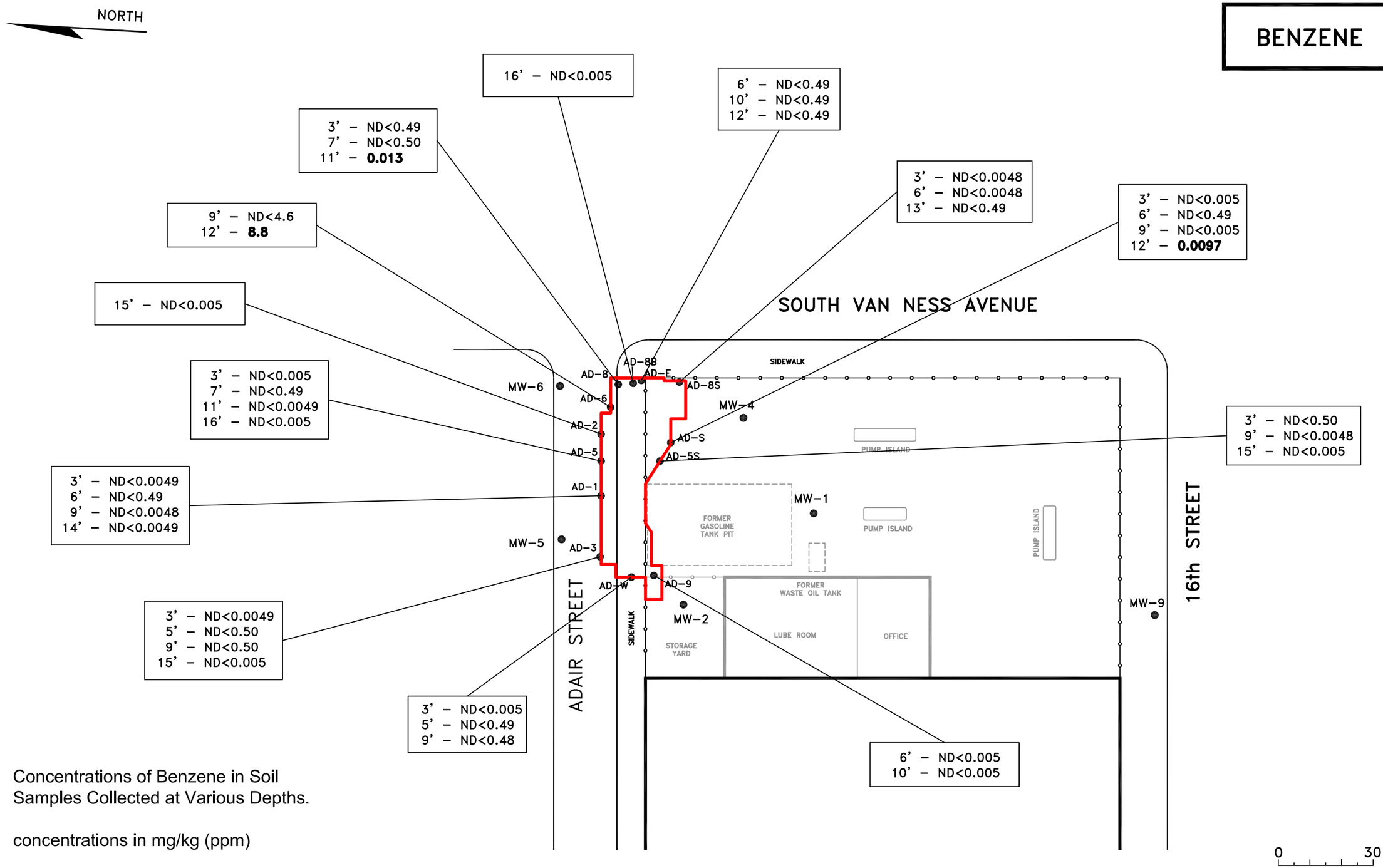
0 30
FEET

Concentrations of TPH-gas in Soil Samples Collected at Various Depths.

concentrations in mg/kg (ppm)

depths in feet below ground surface

BENZENE



Concentrations of Benzene in Soil Samples Collected at Various Depths.

concentrations in mg/kg (ppm)

depths in feet below ground surface

ATTACHMENT B

Dust Control Plan

GRANITE EXCAVATION & DEMOLITION
FUGITIVE PARTICULATE
MATTER EMISSIONS PREVENTION IMPLEMENTATION PLAN
(DUST CONTROL PLAN)

The following Fugitive Particulate Matter Emissions Prevention Implementation Plan was developed by Granite Excavation & Demolition (GED) to comply with the requirements of 40 C.F.R. § 49.126 and as requested by the Department of Public Health, Local Oversight Program (DPH-LOP).

Conducted by: Erwin O'Toole – Project Manager erwin@granitesf.com

Site address: 450 South Van Ness Ave, San Francisco, CA 94103

Prime Contractor: Granite Excavation and Demolition Inc.
160 S. Linden Ave, Suite 100,
South San Francisco, CA 94080
650 737 8700

INTRODUCTION

Granite Excavation & Demolition Inc. has been asked to provide a "Dust Control Plan" by the Department of Public Health, Local Oversight Program (DPH-LOP).
In line with the language used in 40 C.F.R. § 49.126 we have elected to call this a "*Fugitive Particulate Matter Emissions Prevention Implementation Plan*"

DESCRIPTION OF THE WALK THROUGH AND THE RESULTS

Erwin O Toole, Project Manager conducted a walk through on 10.04.11 between 09.00 am and 10.00 am at the remediation site. The site is located 450 South Van Ness Ave, San Francisco, CA 94103 and measures 150'x 95'. The walk through consisted of walking around the site to identify the potential sources of fugitive particulate matter emissions during the demolition of the asphalt and the excavation of the ground.

DUST SOURCES FROM DEMOLITION PHASE AND EXCAVATION PHASE

As the old asphalt is lifted there will be potential fugitive emissions from:

1. the break up of the asphalt
2. the loading of the asphalt into semi trucks
3. the dry soil under the asphalt concrete
4. the stockpiling of the dirt
5. loading stockpiled dirt into the trucks

CONTROL MEASURES

1. During work operations, water will be used to wet down the area that is being demolished prior to starting the demolition. During the demolition process a water spray will be used to minimize the fugitive particulate matter emissions. The water source is from the hydrant located on the corner of 16th and South Van Ness connected with a water meter to a two inch fire line with a spray/ mister nozzle.
2. During the loading of the trucks with demolition debris a water spray will be used to minimize fugitive particulate matter emissions. The trucks will have tarpaulins installed to cover their loads prior to leaving the site to ensure there are no emissions while the trucks are in transit. The trucks will only be loaded on hardscape areas. This will ensure no street sweeping is necessary as no dirt will be tracked out onto the street. Truck tires are to be inspected before leaving the site.
3. After the asphalt concrete is lifted the ground will be sprayed with water to minimize fugitive particulate matter emissions.
4. The stockpiled dirt will be placed on 6 mil plastic and covered after every work shift. During work shifts the dirt stockpile will be kept constantly misted to minimize fugitive particulate matter emissions. The stockpiles will not be placed in areas that will block site drainage. All storm and sewer water inlets will be protected from runoff.
5. The stockpiled dirt will be loaded into trucks after the stockpiles are profiled. Again, during the loading of the trucks with demolition debris a water spray will be used to minimize fugitive particulate matter emissions. The trucks will have tarpaulins installed to cover their loads prior to

leaving the site to ensure there are no emissions while the trucks are in transit. The trucks will only be loaded on hardscape areas. This will ensure no street sweeping is necessary as no dirt will be tracked out onto the street. Truck tires are to be inspected before leaving the site.

PROCEDURES THAT GED WILL PERFORM TO MINIMIZE FUGITIVE PARTICULATE MATTER EMISSIONS.

a) Water sprays will be used to minimize fugitive particulate matter emissions from the demolition of the asphalt concrete.
b) A supervisor will monitor the demolition process and ensure that water sprays are turned on as required to minimize fugitive particulate matter emissions.
c) A log of the dates and times the water sprays are turned on and off will be maintained.
d) A supervisor will monitor the movement of haul trucks and demolition equipment and ensure that water is used as required to minimize fugitive particulate matter emissions.
e) Tarpaulins will be fitted to trucks hauling demolition debris off site, to minimize potential fugitive particulate matter emissions.

PROCEDURES FOR MONITORING PERFORMANCE

Hydo Analysis has been hired by the owner to formulate some dust monitoring procedures. They will have a certain amount of dust monitoring points on site. We generally use PDR DataRAM 1000 Particulate Monitors. The DataRAM instruments are designed to sample ambient air and record the particulate concentration in air that flows past the monitor in micrograms per cubic meter (µg/m3). The particulate monitors are usually set to alarm at 300 µg/m^3 but background levels should be monitored for a few days prior to operations.

These instruments are useful tools as they show tangibly that Particulate Matter Emissions or dust is being kept under control at the source.

However, nothing can beat good old fashioned site supervision. The key to this document is to outline the need to keep water on the debris at the construction site as much as possible.

ATTACHMENT C

Health & Safety Plan

A SITE HEALTH AND SAFETY PLAN

Soil Excavation & Shoring
Former Auto Repair Facility
490 South Van Ness Ave
San Francisco, CA

Prepared by:

Granite Excavation & Demolition Health & Safety
160 South Linden Ave.
Suite 100
South San Francisco, CA. 94080

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SECTION 1: INTRODUCTION

Granite Excavation & Demolition, Inc. (GED) has developed this Health and Safety Plan (HASP) on behalf of Old Sod Construction Inc. (the Parties), to communicate the known and suspected hazards associated with the remediation, Excavation & Shoring of the former Auto Repair Facility located at 490 S. Van Ness Ave, San Francisco, CA. This HASP will also serve to establish appropriate safety procedures for GED and their personnel working at the site.

SECTION 2: KEY PERSONNEL / IDENTIFICATION

The following individuals have been identified as key personnel for this project. Their roles and responsibilities are described in this section.

Project Coordinator: Erwin O'Toole, GED

Site Superintendent: Gary Hanson GED

Site Health & Safety Coordinator: Tony Martinez, GED

2.1 PROJECT COORDINATOR

The Project Coordinator will have overall responsibility for all aspects of the remediation project and will report directly to the Project Directors. The Project Coordinator will have direct supervision of the Site Superintendent and will ensure that all remediation activities are performed in accordance with the Soil Excavation Work Plan (SEWP). The Project Coordinator will coordinate all sampling activities and will be responsible for maintaining all field files, project tracking, and preparing daily and weekly progress reports.

The Project Coordinator will be identified as the day-to-day point of contact with the Owners r or his designee and will be responsible for administration of all actions by the Parties under the terms of the (SEWP).

2.2 SITE SUPERINTENDENT

The Site Superintendent will be the corporate entity responsible for implementation of all work specified in the contract documents. The Site Superintendent will report directly to the Project Coordinator. The Site Superintendent will be responsible for overseeing all operations related to demolition, excavation, handling, transportation, and disposal of materials from the site. The Site Superintendent will be responsible for ensuring that all work activities are performed in accordance with the requirements of the HASP.

2.3 SITE HEALTH AND SAFETY COORDINATOR

The Site HSC will have primary responsibility for the daily implementation of the HASP at the site. The HSC will oversee all health and safety issues associated with demolition, excavation, air monitoring, site inspections, decontamination of equipment and personnel, and materials leaving the site. The HSC will verify proper training of all site personnel and will have the authority to require the use of personal protective equipment as outlined in the HASP. The HSC will have stop work authority if methods or practices are unsafe in her opinion.

SECTION 3: OPERATION SAFETY AND HEALTH RISK ANALYSIS

This section addresses the identified health and safety hazards associated with the activities covered by this HASP.

Job hazard analyses will be performed by the site HSC and the Site Superintendent Project Manager on an as-needed basis. These task-specific hazard analyses will address the hazards and safety procedures associated with individual operations or tasks, such as permitting a confined space entry or developing a lifting plan for crane operations.

3.1 SITE DESCRIPTION

The Site is bound to the west by 16th Street and to the east by S. Van Ness Ave, Figure 1). Properties in the immediate vicinity are developed for office, warehouse, apartments l and retail use. Business parks are present north and south of the property.

Topography in the vicinity of the site is generally flat. Asphalt and concrete cover the entire ground surface. Surface water runoff at the site flows into storm drains located near 16th and South Van Ness Avenue.

3.2 SITE HISTORY

The Site is a former auto repair facility located at 490 South Van Ness Avenue, San Francisco, CA

3.3 SCOPE OF WORK

The scope of work is to excavate the 150 x 95 foot site down to a depth of 15 feet bgs. It is proposed to install a temporary shoring bulkhead to support the excavation as necessary. It is anticipated that 10 dewatering wells will be required on site to lower the water table in the 10 to 15 feet below ground surface zone.

An excavator, loader, and other required equipment will be used to break up and remove pavement. Debris will be segregated from the soil to be extracted and transported as non-hazardous waste to a recycle facility. It is anticipated that any areas of concern will be marked out prior to asphalt removal under a seperate plan and excavated and disposed of separately. Maximum excavation depth will be approximately 15 feet or two to five feet into the groundwater table. Depth to groundwater at the site ranges between 9 and 14 feet bgs with an average depth of 12 feet bgs.

Floating product, if encountered, will be stored in 55-gallon DOY approved drums for subsequent of-site disposal within 90 days.

Prior to the start of work, GED will be required to adopt this HASP for their personnel. Should additional contractors or subcontractors become involved in potentially hazardous work at the site, they will be required to adopt this site-specific HASP for their personnel. In this event, the new contractor will be given the opportunity to review this HASP and request any modifications appropriate to the nature of their work. Any request for site-specific HASP modification must be reviewed and approved by the site HSC and the GED Project Coordinator as described in the HASP.

The procedures contained herein are based upon the best available information at the time of the plan's preparation. As new information becomes available, the HASP will be revised accordingly to ensure protection of site personnel. To make a revision to the HASP document, the revision must be described in a Memorandum of HASP Modification, approved by the HSC and the GED Project Coordinator, and provided to the health and safety coordinator from each contractor on site for review and comment.

3.4 CHEMICAL HAZARDS

Contaminated soils containing petroleum hydrocarbons, gasoline (TPH-g), benzene, toluene, ethylbenzene, and xylenes have been determined to be the primary constituents of concern on site.

Every hazardous chemical that is brought on site by any of the contractors must be reported to the site HSC in accordance with the Occupational Safety and Health Administration‘s (OSHA's) Hazard Communication Standard, 29 CFR 1910.1200.

A complete file of Material Safety Data Sheets (MSDSs) will be provided and maintained by the Site Superintendent for all constituents identified at the site or for any chemicals or petroleum products brought on site. The MSDSs provide a summary of toxicological data information, chemical properties, and proper handling procedures for the materials.

Based on the historical laboratory soil analytical results of previous soil sampling investigations, impacted soils will be manifested and transported to an approved disposal facility in DOT approved trucks using a California waste hauler. Handling and transportation of impacted soils will be in accordance with all federal, state, and local requirements.

The personal protective equipment (PPE) and procedures specified for these specific activities will reflect the level of protection needed.

The potential for public exposure is greatest through the direct contact route. Site activities that do not involve the handling or removal of potentially affected material have minimal potential for chemical

exposures. For onsite personnel not associated with the remediation activities, the area will be cordoned off.

3.5 BIOLOGICAL HAZARDS

Biological hazards include plants, animals, bacteria, or viruses that may cause disease in humans. A wide variety of biological hazards are present in and around the site work area. These include, but are not limited to, rodents, bees, wasps, and bloodborne pathogens. Workers should avoid contact and adopt appropriate controls.

Allergic reactions caused by contact with plants, insect bites, and other biological hazards should be reported to the site HSC.

All first-aid activities involving potential exposure of personnel to blood or blood-tainted (contaminated) body fluids shall be conducted in accordance with the requirements of the Bloodborne Pathogen Standard, 29 CFR 1910.1030.

Personnel involved in first-aid procedures shall don the proper PPE and dispose of blood-contaminated materials as required. Responding personnel will don surgical gloves and other PPE deemed necessary by the site HSC at the time of the incident.

An adequate inventory of such PPE will be maintained with the first-aid kit located at a known first-aid station near the decontamination area. Contact with blood or blood-tainted body fluids during first-aid procedures should be reported immediately to the HSC.

3.6 PHYSICAL AND ENVIRONMENTAL HAZARDS

Physical and environmental hazards may be encountered during work activities. The site HSC will be responsible for maintaining an Injury & Illnesses Prevention Program (IIPP) and may be used for many of these activities. Contractors or subcontractors preferring to use their own procedures may do so, where applicable, provided they are at least as protective of site personnel as this site-specific HASP. Prior to using an alternate procedure, however, the contractor will be required to submit the company‘s written program to the site HSC for approval. Work activities will be performed in accordance with applicable OSHA regulations. Specific emphasis will be placed on the anticipated physical and environmental hazards described in the paragraphs that follow.

3.6.1 Slips, Trips, and Falls

All work paths and work areas must be kept clear of slip and trip hazards. Applicable OSHA standards for walkways, stairways, etc. (29 CFR 1926.500) will apply.

3.6.2 Heavy Equipment

The number of ground personnel working around heavy equipment shall be kept to a minimum. Workers should maintain eye contact with operators. Only experienced equipment operators shall be permitted to operate heavy equipment. All machines will be supplied with a fire extinguisher and a backup horn. The equipment operator shall inspect the equipment each morning prior to use to ensure that all safety equipment and devices (e.g., backup alarms, brakes) are fully operational. Trackhoes, backhoes, dump trucks, and Bobcats may be used during the course of this remediation.

3.6.3 Fuel Storage

Fuel for equipment will be from truck mounted tanks only. Storage tanks will not be permitted on site.

3.6.4 Electrical Power

All electrical power must have a ground fault circuit interrupter as part of the circuit. All equipment must be suitable and approved for the class of hazard. Applicable OSHA standards for electrical equipment (29 CFR 1926, Subpart K) shall apply.

3.6.5 Equipment Decontamination - Pressure Washer Operations

Personnel participating in equipment decontamination activities shall be properly trained in the operation of the pressure washer prior to beginning decontamination activities. Equipment shall be inspected each day prior to use. All personnel shall don the proper PPE as defined in Section 5. The area will be clearly marked, and all employees not directly involved in these activities shall remain outside the work area.

3.6.6 Heat Stress

When the temperature exceeds 70°F and personnel are wearing protective clothing, a heat stress monitoring program will be implemented, as appropriate. The site HSC will be responsible for implementing this program and for monitoring site personnel for the signs and symptoms of heat stress.
Adequate water will be made available by the remediation contractor at work stations.

3.6.7 Cold Stress

Potential exposure to extreme cold coupled with the presence of moisture may result in cold stress-related disorders. The site HSC will be responsible for monitoring site personnel for the signs and symptoms of cold stress (e.g., skin condition and color, sluggishness). If the signs and symptoms of cold exposure are discovered, the HSC will be responsible for implementing appropriate first-aid procedures. An enclosed, heated environment will be made available at the site during the duration of the project.

3.6.8 Flame, Heat, or Spark-producing Operations

Utilization of flame, heat, and/or spark-producing equipment (e.g., cutting or welding torches, abrasive saws) may be necessary during the course of this project. When the use of such equipment is necessary, the employee will obtain a Hot Work Permit from the site HSC, and the operation will be carefully monitored to ensure compliance with the provisions stated in 29 CFR 1926.353 for flame, heat, or spark-producing operations.

3.6.9 Noise

Those employees working around heavy equipment or in other noisy areas are subject to possible exposure to noise above the OSHA Permissible Exposure Limit (PEL) of 90 decibels (dBA). All heavy equipment operators will be required to use hearing protection unless sound level measurements clearly demonstrate that protection is not required. Other employees will utilize

hearing protection when working around heavy equipment or in areas where sound level measurements in excess of 85 dBA time-weighted average are encountered.

3.6.10 Lifting

All personnel should know their lifting limits and the proper way(s) to lift an object. Lifting should be limited by factors such as: the route and distance to be traveled, the amount of time required, and the center of gravity necessary to handle the load safely. A worker shall not lift more than 50 lb without assistance from another person or mechanical help.

3.6.11 Hand Tools/Power Tools

Proper eye, face, and hearing protection shall be provided and worn while using all power tools. Prior to beginning work operations, the user shall inspect all tools. Defective tools will not be used and will be tagged out. Only tools designed for the application in mind will be used. The proper strength tool will be used as specified for each job. For hand tools, the use of handle extensions and cheater bars is prohibited.

Power tools and machines will be disconnected from their power source before making adjustments or attachment changes. Guards or safety devices will not be removed. All fuel-powered tools will be shut off before refueling. Blade guards must be in place and working properly. Air-powered tools must have safety clips or retainers on all hose connections. Manufacturers' safe operating pressures will not be exceeded for any fittings.

3.6.12 Lockout/Tagout

In accordance with 29 CFR 1910.147 and 29 CFR 1926.417, no work shall be performed on or around any utility lines without proper lockout/tagout procedures in place. Utility lines such as electrical, steam, water, or gas must be rendered inoperative to protect personnel from an unexpected energization or startup that could cause injury. All personnel on this site are required to follow the lockout/tagout procedures that appear in GED‘s Standard Operating Procedure SP-015, Lockout/Tagout. A copy of this procedure will be maintained at the site for the duration of the project.

A preliminary inspection shall be conducted by a qualified person prior to beginning work activities in order to ensure that lockout/tagout procedures have been conducted properly and that the hazards have been adequately removed or controlled.

SECTION 4: PERSONNEL TRAINING REQUIREMENTS

4.1 HAZWOPER TRAINING

All personnel (including visitors) entering the exclusion zone or decontamination zone must have completed all applicable training requirements for hazardous waste site operations (HAZWOPER) in accordance with OSHA 29 CFR 1910.120.
Copies of the current training certificates for all personnel must be provided to the site HSC before beginning work. In the event that any worker's annual training will expire during the course of the project, he must complete the required refresher training prior to the expiration date.
Personnel required to supervise or manage site investigation/cleanup personnel must have an additional 8 hours of supervisory safety training as required under OSHA 29 CFR 1910.120.

4.2 SITE-SPECIFIC TRAINING

The site HSC will design and implement a site-specific training program for all site employees. The program will present all aspects of this HASP and will provide site employees an opportunity to ask questions regarding the HASP. The HSC will instruct employees in proper material handling techniques; proper methods for the use, storage, and disposal of decontamination fluids; preventive maintenance of safety equipment; personal hygiene practices; personal protective equipment; and appropriate responses to emergencies.
The training program will provide site employees instruction on responding effectively to an emergency. The appropriate response to fires, explosions, and the shutdown of operations will be reviewed, as well as the proper response to an unacceptable level of dust resulting from site activities. Emergency procedures, areas of the site that have restricted access, methods used for project decontamination, and general safety will also be covered in the training. At a minimum, the site-specific orientation training program will cover the following topics:

- ◊ Site history
- ◊ Explanation of effects of toxic chemicals identified at the site
- ◊ Requirements for personnel protection (e.g., gloves, hearing protection, respirators)
- ◊ Prohibited actions or procedures
- ◊ Safety precautions
- ◊ Emergency procedures
- ◊ Decontamination procedures
- ◊ Work areas
- ◊ Air monitoring program
- ◊ Symptoms and treatment of heat- or cold-related illness
- ◊ Location of site safety equipment, emergency phone numbers, and route to nearest hospital
- ◊ Confined space and hot work permits
- ◊ Shoring/benching requirements

Prior to working on site, replacement employees must report to the site HSC and will be required to receive the initial training.

4.3 TAILGATE SAFETY MEETINGS

The site HSC or his designee will conduct weekly safety meetings for all personnel at the site. During these meetings, the HSC will discuss any safety concerns, changes in site conditions, monitoring results, or other safety-related topics for the site remediation activities. Periodic retraining on important site-specific safety issues may also be addressed. Attendance lists, including signatures and topics discussed for all safety meetings will be maintained as part of the project safety records.

SECTION 5: PERSONAL PROTECTIVE EQUIPMENT

5.1 GENERAL

The following subsections describe the minimum protective equipment to be used by all personnel involved in project operations at this site. The PPE described here has been selected based on the anticipated chemical and physical hazards associated with each work zone and job function included in the RWP. This HASP may be modified if project hazards or air monitoring results identify higher-than-anticipated levels of VOCs, and/or any other contaminants.

5.2 PERSONAL PROTECTION

The level of protection required on this site is Level “D”
The following are brief descriptions of the levels of PPE that will be required for site activities.
Level "D" Protection
This is the minimum level of protection for all personnel on site and is generally required for all support zone operations.

- Field work uniform
- Steel-toe/steel-shank work boots
- Safety glasses with side shields
- Hard hat

Modified Level "D" Protection
This is the level of protection that is initially anticipated for concrete demolition/removal and soil excavation/backfilling activities inside the exclusion zone.

- Latex, vinyl, or nitrile inner gloves
- Field work uniform
- Steel-toe/steel-shank work boots
- Safety glasses with side shields
- Hard hat

Modified Level "D" With Splash Gear
This dress-out regimen is intended primarily for all "wet" work involving contact with PCBs, VOCs, and metals-affected decontamination or runoff water during equipment decontamination operations.

- Latex, vinyl, or nitrile inner gloves
- Nitrile outer gloves (taped to outer suit)
- Chemical-protective Neoprene overboots (taped to outer suit)
- Steel-toe/steel-shank work boots
- Tyvek coveralls
- Safety glasses with side shields
- Hard hat
- Splash shield

SECTION 6: SITE CONTROL MEASURES

6.1 WORK ZONES

The objectives for establishing work zones at this site are to delineate clearly the hazardous area perimeter, prevent migration of hazardous materials into clean areas, and prevent access or exposure to hazardous areas by unauthorized persons. Figure 2 shows the approximate locations of key work zone boundaries and identifies the anticipated locations for personnel and equipment decontamination facilities and field offices at the site. The actual work zone boundaries may be modified in the field at the discretion of the Site Superintendent.

In the event that modifications to this work zone plan become necessary during either mobilization or site operations, a revised drawing(s) will be prepared, approved, and distributed as a modification to this HASP as described in Section 1.

6.1.1 Exclusion Zone

The exclusion zone boundaries will be clearly identified with caution tape or safety fence, and signs will be posted.

Personnel will don personal protective clothing before entering the exclusion zone as described in Section 5 of this HASP. All personnel entering the exclusion zone will be required to meet the training and medical monitoring requirements defined in Sections 4 and 6 of this HASP.

6.1.2 Contamination Reduction Zone

The contamination reduction zone/decontamination zone is the area where all personnel and equipment decontamination will take place. This area will be clearly identified, and access will be restricted.

6.1.3 Support Zone

The support zone includes all areas for support operations, including office facilities, equipment storage, a break area, sanitary facilities, emergency vehicle access, and designated parking.

6.1.4 Project Control Zone

The project control zone identifies the entire area that is under secured project control and is restricted from access by the general public. This zone is delineated for the purpose of clarifying the boundary for the prevention of accidental entry into the project work areas by the general public. Signs will be posted to deter the general public from entering the project control zone without authorization.

6.2 SITE SECURITY

Security may be provided during those periods when no work activities are being performed at the Site for the duration of the soil remediation, and shoring activities. The need for security will be determined by the Site Coordinator

6.3 VISITORS

All visitors to the project site will be required to report immediately to the Site Superintendent , who will provide a sign-in sheet for the visitor(s) to sign. Visitors' vehicles should be parked in designated locations to avoid interfering with project operations.

In general, visitor access to the site will be limited to designated support zone areas. In the event that it becomes necessary for a site visitor to proceed beyond the support zone, he/she must be escorted at all times by the Site Superintendent or their designee.

6.4 GENERAL FIELD SAFETY AND STANDARD OPERATING PROCEDURES

The following is a list of policies and procedures to be implemented during work operations at this site:

◊ The "buddy system" will be used by all field personnel in the exclusion zone. Visual, voice, or radio communication must be maintained at all times.

◊ Eating, drinking, and smoking are permitted only in designated areas in the support zone. No smoking will be permitted except in the designated area.
◊ Hands and face must be thoroughly washed immediately upon leaving the contamination reduction zone and prior to eating, drinking, or smoking to eliminate bacteriological concerns.

SECTION 7: DECONTAMINATION PLAN

In general, everything that enters the exclusion zone that comes into contact with contaminated material must either be properly decontaminated or discarded upon exit from the exclusion zone.

7.1 PERSONNEL DECONTAMINATION

During soil excavation, there will be a need for personnel decontamination facilities. At a minimum, the personnel decontamination facilities will include a field wash station:

7.2 EQUIPMENT DECONTAMINATION

Prior to demobilization, equipment, any vehicle working in an exclusion zone will be decontaminated before leaving the site. The vehicle will be cleaned by sweeping excess soil and debris off the wheels. Water will then be used to wash the wheels, if necessary. Each piece of equipment will be inspected after cleaning for any soil remaining on the tires or elsewhere. All vehicles will be cleaned to the satisfaction of the site HSC or his designated assistant prior to entering the support zone or leaving the site. Wipe samples may periodically be collected to verify the effectiveness of the decontamination efforts.

SECTION 8: EMERGENCY RESPONSE/CONTINGENCY PLAN

The following response procedures have been developed in an effort to prepare project site personnel to respond effectively in the event of an emergency. Every accident is a unique event that must be dealt with by trained personnel working in a calm, controlled manner. In the event of an accident/unusual event, the prime consideration is to provide the appropriate initial response to assist those in jeopardy without placing additional personnel at an unnecessary risk.

8.1 GENERAL RESPONSE CONSIDERATIONS

Emergencies must be dealt with in a manner that minimizes the health and safety risks to site personnel and the public. The following procedures will be implemented in the event of an emergency:

First-aid or other appropriate initial action will be administered by those closest to the accident/event. This assistance will be coordinated by the ranking individual on site and will be conducted in a manner such that those rendering assistance are not placed in a situation of unacceptable risk. The primary concern is to avoid placing a greater number of workers in jeopardy.

Employees must report all accidents and unusual events immediately to the site HSC and the GED Site Superintendant .

The Site Superintendant is responsible for initiating the emergency response in an efficient, rapid, and safe manner. The Site Superintendant will decide if offsite assistance and/or medical treatment are required and will be responsible for alerting offsite authorities and arranging for their assistance.

The The Site Superintendant will provide the HSC with an Accident/Incident Report that is included in GEDs IIPP and will include the following:

◊ A description of the emergency (including date, time, duration, and cause).
◊ Date, time, and name of all persons/agencies notified and their response.
◊ A description of corrective actions implemented or other resolution of the incident.

Horseplay will not be tolerated during work activities. All personnel shall be expected to act in a mature manner to prevent potential accidents/incidents from occurring during work activities.

To respond to emergencies, at least one person at the site will be certified in first-aid and cardiopulmonary resuscitation (CPR) by the American Red Cross or other approved agency. These individuals will be available to provide emergency first-aid in the event of an injury.

8.2 RESPONSIBILITIES

The site HSC or Site Superintendant will have the responsibility for directing response activities in the event of an emergency. The HSC will:

◊ Assess the situation.
◊ Determine required response measures.
◊ Notify appropriate authorities.
◊ Determine and direct onsite personnel during the emergency.
◊ At the direction of the HSC contact and coordinate with government agencies.

In the event that outside emergency response agencies are mobilized, the site HSC will coordinate response activities with those of public agencies.

8.3 EMERGENCY CONTACTS

Figure 3 presents a list of response agencies, organizations, and personnel, who may, depending on the nature of the situation, need to be contacted in the event of a site emergency.

8.4 EMERGENCY RESPONSE EQUIPMENT

During the site preparation phase of the project, the project contractors will mobilize the appropriate emergency response equipment and facilities. At a minimum, prior to the start of remediation operations, the following equipment will be provided and tested to verify that it is in working order:

EMERGENCY PHONE LIST

The following is a list of agencies, organizations, and personnel, who may, depending on the nature of the situation, need to be contacted in the event of a site emergency. All primary response agencies will be notified prior to commencement of work as to the nature of activities at the site.

Primary Response Agencies
San Francisco Police Department 911
San Francisco Fire Department 911
Granite Main 650-737-8700
Project Coordinator GED Erwin O'toole 415-531-1009
Health and Safety Officer GED Tony Martinez 415-531-7368

Site Superintendent GED	Gary Hanson	415-240-2756

First-aid station contents of the first-aid kit will meet OSHA 1910.151 requirements
Chemical fire extinguishers at each work location, the decontamination area, and on all heavy equipment; type ABC, 20 lb
List of persons and phone numbers for emergency notification
Working telephone

Other equipment used for the routine implementation of the worker health and safety protection and monitoring programs (i.e., air monitoring equipment, confined space entry equipment) will be available as needed to support any emergency response activity.

8.5 ACCIDENTS AND INJURIES

The majority of worker injuries on hazardous waste sites are not chemical in nature. The injuries tend to be sprains, rashes, and lacerations, which must be treated promptly. Follow up care is extremely important to ensure that a minor injury or illness does not become aggravated by site conditions or continued work in chemical protective clothing. All site personnel are instructed to report any and all injuries and illnesses to the site Superintendent & HSC.

If a person working in an exclusion zone is physically injured, Red Cross first-aid procedures should be followed. Depending on the severity of the injury, emergency medical response may be sought. If the employee can be moved, he will be taken to the edge of the work area (on a stretcher, if needed), where contaminated clothing will be removed, emergency first-aid administered, and transportation to a local emergency medical facility awaited. Directions and a map to the nearest hospital are presented in Figure 4. This figure will be posted at each site telephone and will be placed in each site vehicle.

If it is necessary for outside emergency medical personnel to enter the exclusion zone to treat or move an injured worker, the site HSC will brief these personnel on the nature of the hazards present and will determine what protective equipment they must wear. Extra PPE will be available for emergencies.

If the injury to the worker is chemical in nature (e.g., overexposure), first-aid procedures will be implemented as described in the MSDSs for the chemical(s) involved. Material Safety Data Sheets for all hazardous substances that are present or will be used on the site will be compiled in the field and made available to all employees at the site HSC‘s office trailer. Material Safety Data Sheets for known hazardous substances will be available at the site.

Personnel will conduct first-aid procedures and dispose of all blood-contaminated materials in accordance with the requirements of the bloodborne pathogens standard, 29 CFR 1910.1030. All personnel shall be required to don safety glasses and latex gloves (at a minimum) when conducting first-aid procedures and cleanup operations where blood or blood-tainted body fluids are involved. They shall also be required to wash hands, face, and neck thoroughly following cleanup activities. Potential exposures should be reported to the site HSC immediately.

8.6 FIRES

Although a fire is unlikely, the HSC will maintain effective communication to summon assistance in the event of a fire. If a fire breaks out, the site Superintendent will be notified immediately. The Superintendent will evaluate the extent of the fire and make a decision whether to call the local fire department or have site personnel attempt to operate firefighting equipment. Site personnel will only become involved in the firefighting actions when the fire is clearly within the capability of the fire extinguishers on site. All personnel shall be trained in the use, capabilities, and limitations of the available fire extinguishers.

8.7 SITE EVACUATION PLAN

Procedures for evacuation have been established for this project even though the materials being handled and the procedures being used make an actual evacuation extremely unlikely. The gathering point in the event of an emergency will be determined by the Site Superintendent and conveyed to all personnel on the site before work starts daily

ATTACHMENT D

Foundation Membrane Data

epro™
Waterproofing Systems

P.O. Box 347
Derby, KS 67037

Toll Free • 800-882-1896
Phone • 316-262-2513
Fax • 316-262-2529

April 29, 2013

Anthony Froyd
High End Development
5056 Commercial Cir.
Unit C
Concord, CA 94520

cc: David Devine

Re: 490 South Van Ness Project VOC Concentrations

This letter is to confirm that Epro Services has reviewed the attached report that shows the max VOC concentration levels at the above reference project site and confirms that these levels are acceptable levels for the installation of the System III MB and/or System III MBB. The standard System III MB/MBB design is for levels 10 to 12 times than these reported levels. Alternate designs are available for higher levels of concentration

If you have any questions regarding this matter, please feel free to contact me at (800) 882-1896 or by email at dpolk@eproserv.com.

Regards,

David M. Polk
President

490 South Van Ness

Shallow Groundwater
(3-5 feet below street grade)

Constituent	Highest Observed Concentration (µg/L)
TPH as Gasoline	**5,400**
Benzene	**370**
Toluene	**880**
Ethybenzene	**150**
Xylenes	**1,500**
MTBE	ND < 0.5
TPH as Diesel	**500**

HIGH END DEVELOPMENT INC.

SUBMITTAL

for

490 S. Vaness

April 10, 2012

General Contractor: Old Sod Construction

Product(s)/Spec:
Ecoline S Product Literature
Ecoline R Product Literature
Ecoline T Specification
Ecodrain E
Ecoshield P Product Literature
Ecoshield PP Product Literature
Ecoshield PB Product Literature
Ecoflex F Product Literature
Sikaflex 1A Product Literature
Ecoshield E Product Literature
Eprostop HPL Product Literature
Epro Polyester 160 Specification
TB-100 Termination Bar
Under Slab to Blindside Tie In Dwg. 1
Lagging Wall Rebar Anchor Dwg. 2
Lagging Wall Rebar Anchor Stud Penetration Dwg. 3
Lagging Wall Detail Tie Back Non Watertable Dwg. 4
Lagging Wall Detail Tie Back In Watertable Dwg. 5
Penetration Detail Blindside Watertable Dwg. 6
Penetration Detail Blindside Watertable Dwg. 7
Lagging Wall Detail Penetration Non Watertable Dwg. 8
Box Out/Abandonment of Dewatering Wells Dwg. 9

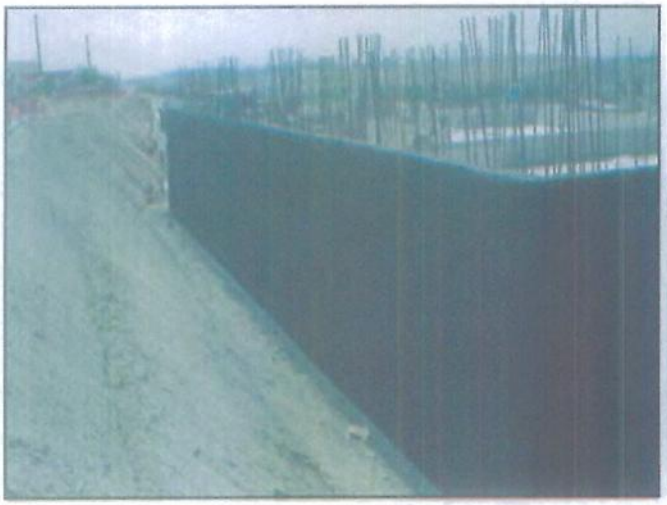
Contractors Approval/Comments:

Architects Approval/Comments

5056 Commerical Circle Unit C
Concord, CA 94520
Ph: 925-687-2540 / Fax: 925-687-8245
License # 891914

ECOLINE-S Spray Applied Membrane

Seamless Waterproofng For The Most Demanding Applications



The Answer To Seam and Adhesive Failures

- Water based ... may be applied to green or uncured concrete, damp surfaces, and lightweight forms.
- Excellent elongation and recovery ... can handle expansion and contraction as well as minor cracking.
- Exceptional bonding ... won't delaminate from surface, even with ponded water.
- Spray applied ... creates a seamless and resilient membrane.
- Instant build ... allows applications in inclement weather and eliminates shrinkage.

COVERAGES	TEST METHOD	UNITS
Walls		60 mils (19 sq. ft./gal.)
Decks		60 mils (19 sq. ft./gal.)
Typical Uncured Properties		
Specific Gravity	ASTM D 244	1.00
Viscosity	ASTM D 1200	>25 centipoise
PH		12.3
Flammability	ASTM D 3143	500° F
Color		Brown to Black
Non-Toxic		No Solvents
Shelf Life		6 months
Typical Cured Properties		
Tensile Strength	ASTM 412	32 psi
Elongation	ASTM 412	4,140%
Resistance to Decay	ASTM E 154 Section 13	4% Perm Loss
Accelerated Aging	ASTM G 23	No Effect
Moisture Vapor Transmission	ASTM E 96	0.088 g/sq. ft./ hr.
Hydrostatic Water Pressure	ASTM D 751	26 psi
Perm rating	ASTM E 96 (US Perms)	0.21
Methane transmission rate	ASTM D 1434	0
Adhesion to Concrete & Masonry	ASTM C 836 & ASTM C 704	11 lbf/inch
Hardness	ASTM C 836	80
Crack Bridging	ASTM C 836	No Cracking
Low Temp. Flexibility	ASTM C 836-00	No Cracking at -20°C
Resistance to Acids:		
Acetic		30%
Sulfuric and Hydrochloric		13%

Packaging: Available in bulk, 275 gal. totes, or 55 gal. drums. **Approvals:** City of Los Angeles Report #RR 25478, NSF

EPRO SERVICES
P.O. Box 347
Derby, KS 67037 USA

epro™ Waterproofing Systems

Phone: 800-882-1896
316-262-2513
Fax: 316-262-2529

ECOLINE-S Specifications

1. PRODUCT NAME

ECOLINE-S

2. MANUFACTURER

EPRO SERVICES
P.O. Box 347
Derby, KS 67037
PHONE: 800-882-1896
FAX: 316-262-2529

3. PRODUCT DESCRIPTION

Basic Use: ECOLINE-S is designed to be a waterproof and methane barrier membrane for a variety of surfaces including concrete (uncured), block, wood, and metal and for a variety of applications including decks, walls (both negative and positive side) and water retainment structures. ECOLINE-S is to be applied with a unique self-contained sprayer to produce instantaneous, monolithic high-build membranes at accelerated rates. It may be used as a waterproofing adhesive for protection/insulation board or tile and as a base coat for other water-based products.

Composition: ECOLINE-S is a low-viscosity, water-based, anionic bituminous/asphalt emulsion modified with a blend of synthetic polymerized rubbers and special additives, which is highly reactive and exhibits exceptional bonding, elongation, waterproofing and build characteristics.

Benefits:
- Performs as a gas and water barrier.
- Non hazardous, non-toxic, and non-flammable (VOC compliant).
- Excellent elongation and recovery.
- Good tensile strength.
- Exceptional bonding.
- Not affected by ponded water.
- Instantaneous build.

Limitations:
- Should be applied to clean surfaces.
- Adjacent areas and surfaces should be protected from contact with the product.
- Exposure to UV.
- Should be stored above 40°F.
- A test area should always be done to verify compatibility of substrate with product.
- Solvent-based products should not be applied over this product.

4. TECHNICAL DATA

Properties: See chart.

Coverages: See chart.

- **Specification Writer:**
Contact EPRO Services before writing specifications on this product. Test information available upon request.

5. INSTALLATION

Preparation: Must include but not limited to:
- All surfaces should be free of loose materials, and other contaminants. These should be removed prior to application by suitable methods.
- Repairs: Any cracks, spall or metal protrusion areas should be repaired by brush or trowel application of ECOLINE-T insuring penetration of material into damaged or cracked area. Large cracks may also require a layer of polyester fabric being spanned over crack and ECOLINE-T applied over this to provide additional strength.
- A test should always be done prior to application using the same cleaning preparation and application procedures to be used on the project.

Application:
- Should be applied in accordance with specific application specifications.
- ECOLINE-S is to be spray applied with catalyst water by appropriate equipment fitted with specific nozzles which forms a monolithic water protection coating.

Spray application produces an approximate 20 mil build on each pass of spray gun.

Cleaning: Clean all tools with kerosene and/or equivalent.

6. AVAILABILITY AND COST:

Contact the local distributor and/or Authorized Applicator for availability and cost.

7. WARRANTY

Limited Warranty: 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.

8. MAINTENANCE:

No maintenance required.

9. TECHNICAL SERVICES AND INFORMATION:

Complete technical services and information are available from EPRO Services.

epro™ Waterproofing Systems

A WORLD OF DIFFERENCE FOR REAL WORLD CONDITIONS

ECOLINE-R Liquid Applied Membrane

STRETCHES THE LIMIT FOR BELOW GRADE WATERPROOFING

Effective Water and Vapor Barrier System

- Water based...may be applied to green or uncured concrete and to damp surfaces.
- Exceptional bonding...won't delaminate from surfaces.
- Non-toxic, non-flammable, non-hazardous...user and environmentally friendly.
- Viscosity...makes high-build application repairs with mesh or polyester mat easier.
- Rapid setting...allows job to be done in one application.
- LEED® credits available.

PROPERTIES	TEST METHOD	UNIT
TYPICAL UNCURED PROPERTIES		
Specific Gravity		1.034
Viscosity		9m-13m centipoise
PH		11.5
Flammability		270° F
Color		Brown to Black
Non-Toxic		No Solvents
Shelf Life		6 months
TYPICAL CURED PROPERTIES		
Initial Cure		30 minutes
Final Cure		24 -48 hours
Tensile Strength	ASTM 412	32 psi
Elongation	ASTM 412	3,860%
Resistance to Decay	ASTM E 154 Section 13	9% Perm Loss
Accelerated Aging	ASTM G 23	No Effect
Moisture Vapor Transmission	ASTM E 96	0.071 g/sq. ft. /hr.
Hydrostatic Water Pressure	ASTM D 751	28 psi
Perm rating (US Perms)	ASTM E 96	0.17
Methane transmission rate	ASTM D 1434	0
Adhesion to Concrete & Masonry	ASTM C 836	7 lbf./inch
Hardness	ASTM C 836	85
Crack Bridging	ASTM C 836	No Cracking
Low Temp. Flexibility	ASTM C 836-00	No Cracking at –20°C
Resistance to Acids:		
Acetic		30%
Sulfuric and Hydrochloric		15%
COVERAGES		
60-mils wet (to achieve 40-mils cured)		28 sq. ft./gal
90-mils wet (to achieve 60-mils cured)		19 sq. ft./gal

Packaging: Available in 1 or 5 gal. containers

Approvals: City Of Los Angeles RR# 25478 (for methane and waterproofing), NSF Standard 61 for potable water containment

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ECOLINE-R Specifications

1. PRODUCT NAME

ECOLINE-R

2. MANUFACTURER

EPRO SERVICES, INC.
P.O. Bprojectox 347
Derby, KS 67037
PHONE: 800-882-1896
FAX: 316-262-2529

3. PRODUCT DESCRIPTION

Basic Use: ECOLINE-R is designed to be a waterproof and vapor retardant membranc for a variety of surfaces including concrete (uncured), block, wood and metal and for a variety of applications including decks, walls (both negative and positive side) and water retainment structures. ECOLINE-R is used in conjunction with mesh or mat material for repairing cracks, joints and spalled areas. It may be used as a waterproofing adhesive for protection/insulation board or tile and as a base coat for other water-based surface wearing products.

Composition: ECOLINE-R is a medium viscosity water-based, polymer-modified anionic bituminous/asphalt emulsion, which exhibits bonding, elongation and waterproofing characteristic.

Benefits:
- Performs as a vapor and water barrier.
- Non-hazardous, non-toxic, and non-flammable (VOC compliant).
- Excellent elongation and recover.
- Good tensile strength.
- Exceptional bonding.
- Not affected by ponded water.

Limitations:
- Should be applied to clean and dry surfaces.
- Adjacent areas and surfaces should be protected from contact with the product.
- Should be stored above 40° F.
- A test area should always be done to verify compatibility of substrate with product.
- Solvent-based products should not be applied over this product.
- During warm weather application in 10-mil layers is recommended.

4. TECHNICAL DATA

Properties: See chart.

Coverages: See chart.

- **Specification Writer:**
Contact EPRO Services before writing specifications on this product. Test information available upon request.

5. INSTALLATION

Preparation: Must include but not limited to:
- All surfaces should be dry and free of loose materials, release oils and other contaminants. These should be removed prior to application by power washing or other suitable methods.
- A test should always be done prior to application using the same cleaning and application procedures to be used on the project.

Application:
- Should be applied in accordance with specific application specification.
- ECOLINE-R may be applied by roller, brush or sprayer to 40-mil build. Two 20-mil coats will allow ECOLINE-R to cure faster. Cracks and joints should be filled and spanned with mesh prior to final coat application.

Cleaning: Clean all tools with kerosene and/or oil-based cleaners.

6. AVAILABILITY AND COST

Contact the local distributor and/or Authorized Applicator for availability and cost.

7. WARRANTY

Limited Warranty: 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.

8. MAINTENANCE

No maintenance required.

9. TECHNICAL SERVICES AND INFORMATION

Complete technical services and information are available from EPRO Services.

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ECOLINE-T
Exceptional Bonding, Strength, Spanning, and Build Characteristics

TYPICAL UNCURED PROPERTIES		
Specific Gravity:	1.13	
Viscosity:	<50M centipoise	
PH:	10.7	
Flammability:	270 F	
Color:	Brown to Black	
Non-Toxic:	No solvents	
Shelf Life:	6 months	
TYPICAL CURED PROPERTIES		
Initial Cure:	10 minutes	
Final Cure:	24-48 hours	
Tensile Strength:	319.08 PSI	
Elongation:	300%	
Resilience:	80% (recovery)	
Moisture Vapor Transmission:	.01 gm/sq.ft./hr	
Impermeability to water:	Up to 36 PSI	
Bonding:	pull off force 341 PSI	
Resistance to Acids:		
	Hydrochloric:	13%
	Acetic:	30%
	Sulfuric:	13%
Temperature Effect:		
	Stable:	248 F
	Flexible:	13 F

Ecoline-T Specifications

1. PRODUCT NAME:

ECOLINE-T

2. MANUFACTURER

EPRO SERVICES, Inc..
P.O. Box 347
Derby, KS 67037
PHONE: 800-882-1896
FAX: 316-262-2529

3. PRODUCT DESCRIPTION

Basic Use: ECOLINE-T is designed to be a waterproof repair material for a variety of surfaces including concrete (uncured), block, wood, and metal and for a variety of applications including decks, walls (both negative and positive side) and water retainment structures. ECOLINE-T is used in conjunction with mesh or mat material for repairing cracks, joints and spalled areas. It may be used as a waterproofing adhesive for protection/insulation board or file and as a base coat for other water-based surface wearing products.

Composition: ECOLINE-T is a high-viscosity mastic-like material comprised of waterbased bituminous/asphalt emulsion modified with liquid synthetic polymerized rubber and fillers, which exhibits exceptional bonding, strength, spanning, and build characteristics when used in conjunction with reinforcing materials such as fiberglass mesh in multiple layers.

Benefits:

- Superior waterproofing repair material
- Non hazardous, non-toxic, and non-flammable (VOC compliant)
- Excellent spanning and build
- Good tensile strength

• Exceptional bonding
• Not affected by ponded water

Limitations:

• Should be applied to clean and dry surfaces

•Adjacent areas and surfaces should be protected from contact with the product

• Should be applied above 40OF

• A test area should always be done to verify compatibility of substrate with product

• Solvent-based products should not be applied over this product

4. TECHNICAL DATA

Properties: See chart.

Coverages: See chart.

• Specification Writer: Contact EPRO Services, L.C. before writing specifications on this project. Test information available upon request.

5. INSTALLATION

PREPARATION: Must include but not limited to:

• All surfaces should be dry and free of loose materials, release oils and other contaminants. These should be removed prior to application by power washing or other suitable methods.

• A test should always be done prior to application using the same cleaning and application procedures to be used on the project.

APPLICATION

• Should be applied in accordance with specific application specifications.

• ECOLINE-T may be applied by brush or other suitable tools. Application of 20 mil coats will allow ECOLINE-T to cure faster. Cracks and joints should be filled and spanned with mesh in multiple layers prior to final coat application. Deep cracks should be filled up to 1/4" from substrate surface with backer rod or other suitable material and adhered in place by ECOLINE-T prior to spanning with ECOLINE-T and mesh.

CLEANING: Clean all tools with kerosene and/or oil-based cleaners.

6. AVAILABILITY AND COST: Contact the local distributor and/or Authorized Applicator for availability and cost.

7. WARRANTY

Limited Warranty: 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.

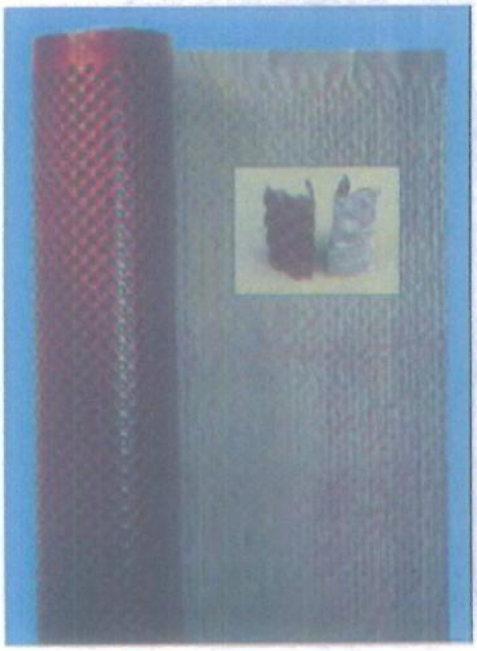
MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. EPRO's liability shall be limited in all events to supplying sufficient product to retreat the specific areas to which defective product has been applied. EPRO shall have no other liability, including liability for incidental or resultant damages, whether due to breach of warranty or negligence. This warranty may not be modified or extended by representatives of EPRO or its distributors.

8. MAINTENANCE: No maintenance required.

9. TECHNICAL SERVICES AND INFORMATION: Complete technical services and information are available from EPRO Services, Inc.

ECODRAIN-E Drainage Composites

MAKES A BIG DIFFERENCE



Economical and Effective Drainage Composite

- HDPE core provides: (1) resistance to chemicals and temperature, (2) a waterproofing barrier, (3) and durability.
- The bonded geo-textile will not delaminate from core in warm temperatures.
- Flexibility for easy detailing of corners without cracking and to handle movement.
- Variable widths (6' and 8') provide minimal overlapping seams and cost effective installation.
- Economically priced – provides a cost effective drainage composite for a total waterproofing system.
- LEED® credits available.

PROPERTY	TEST METHOD	UNIT
CORE	HDPE	
Color	Brown	
Weight	ASTM D 3776	1.90 oz/ft^2
Compressive Strength	ASTM D 1621	5,200 lbs/ft^2
Thickness	ASTM D 1777	0.31 in.
FILTER FABRIC (Polypropylene)		
Grab Tensile Strength	ASTM D 4632	130 lbs
Elongation	ASTM D 4632	60%
Trapezoidal Tear	ASTM D 4533	60 lbs.
Puncture Strength	ASTM D 4833	40 lbs.
Apparent Operating Size	ASTM D 4751	70 sieve size
Mullen Burst	ASTM D 3786	140 psi
Permittivity	ASTM D 4491	0.7 sec.
Water Flow Rate	ASTM D 4491	55 gpm/ft^2
Weight Typical	ASTM D 5261	4.0 oz/yd^2
UV Resistance	ASTM D 4355	70% (500 hrs.)
COMPOSITE SYSTEM		
Water Flow Rate (V)	ASTM D 4716	5.1 gal/min/ft
Water Flow Rate (H)	ASTM D 4716	---
Roll Size	ASTM D 4716	6.0 ft x 65.5 ft, 8.0 ft x 65.5 ft
Roll Weight	ASTM D 4716	60 lbs, 73 lbs

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ECODRAIN-E Specifications

1. PRODUCT NAME

ECODRAIN-E

2. MANUFACTURER

EPRO SERVICES, INC.
P.O. Box 347
Derby, KS 67037
PHONE: 800-882-1896
FAX: 316-262-2529

3. PRODUCT DESCRIPTION

Basic Use:
ECODRAIN-E has been specifically designed to meet the drainage and protection requirements in below grade waterproofing applications. ECODRAIN-E drainage composites effectively eliminate hydrostatic pressure against below-grade structures and aid in de-watering saturated soil by collecting and conveying groundwater to a drain pipe for discharge while protecting the waterproofing membrane.

Composition:
ECODRAIN-E features a lightweight three-dimensional, highly flexible HDPE core and a polypropylene filter fabric. The filter fabric is bonded to the dimples of the HDPE core. This bonding prevents backfill from pushing fabric into the flow channels and reducing waterflow. The filter fabric allows water to pass freely into the molded drain core where gravity draws the water through the flow channels to the discharge system, while preventing soil particles from entering and clogging the core structure and discharge pipe, significantly increasing the effectiveness and service life of the drain system.

Benefits:
- High density polyethylene core provides: (1) resistance to chemical attack from soil, (2) secondary waterproofing barrier, (3) thermal resistance, and (4) flexibility for easy detailing of corners.

- The bonded geo-textile will not delaminate from core in warm temperatures.

- Convex (rounded) dimple design reduces stress on protected waterproofing membrane or insulation board from backfill pressure while eliminating hydrostatic water pressure.

- Remains flexible even in freezing temperatures.

- Variable widths (6' and 8') provides minimal overlapping of seams and very cost effective installation.

Limitations:
- Should not be exposed to long duration of UV.

4. TECHNICAL DATA

Properties: See chart.
Coverages: See chart.

Specification Writer:
Contact EPRO Services before writing specifications on this product. Test information available upon request.

5. INSTALLATION

Preparation: See specific application guide specifications.

Application: Should be applied in accordance with specific application guide specifications.

Tools: No special tools required for installation.

6. AVAILABILITY AND COST

Contact the local distributor and/or Authorized Applicator for availability and cost.

7. WARRANTY

Limited Warranty: 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.

8. MAINTENANCE

No maintenance required.

9. TECHNICAL SERVICES AND INFORMATION

Complete technical services and information are available from EPRO Services.

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ECOSHIELD - P

Does A Lot More Than Provide Protection

High Strength Laminated Polypropylene Geomembrane

- High puncture resistance (Class A rating)...provides maximum protection and durability.
- Impermeable to water and gases (methane).
- Provides an excellent substrate for grouts, mortar and concrete to adhere to.
- Large roll sizes (12' x 150') minimize seams.
- Reinforces the spray or fluid applied membrane.

Ecoshield-P Physical Properties	Test Method	
Film		Grey HDPE Film Polypropiene Non-Woven
Grab Tensile Strength	ATSM D-882	24 lb/in
Grab Tensile Elongation	ATSM D-882	500%
PP Tear	ATSM D-2582	17.6 lbs
Puncture	ASTM D-1709	1.1 lbs
UV Resistance	ASTM D-4355	70% (after 150 hrs. exposure)
Light Reflectance	ASTM E-97	70%

Packaging Size: 12' x 150', Weight: 108 lbs.

EPRO SERVICES, INC.
P.O. Box 347
Derby, KS 67037 USA

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Web: www.eproserv.com

rev.: ecosh-p 11.20.11

ECOSHIELD-P Specifications

1. PRODUCT NAME

ECOSHIELD-P

2. MANUFACTURER

EPRO SERVICES, INC.
P.O. Box 347
Derby, KS 67037
PHONE: 800-882-1896
FAX: 316-262-2529

3. PRODUCT DESCRIPTION

Basic Use:
ECOSHIELD-P has been specifically designed to provide cost effective and high performance protection for the waterproofing membrane on horizontal waterproofing applications. The fabric also provides an excellent substrate for thin set grouts, mortar and concrete to bond to. When used in detailing of specific water penetration points (i.e. cold joints, footings, and pipes), it enhances the tensile strength of the other detailing products. It is also to be used as a superior performing vapor and gas barrier underslab.

Composition:
ECOSHIELD-P is an extremely tough, high strength geomembrane made from the lamination of HDPE film and unwoven polypropylene fabric.

Benefits:
- Impermeable to water...offers additional relief from hydrostatic water pressure and resistance to earth contaminates.
- Provides better cured grout, mortar & concrete by retaining a water line.
- Minimal seams with 12'x 150' rolls.
- High puncture resistance protects waterproofing from subsequent construction damage.
- Excellent substrate for grout, mortar and concrete to adhere to.

Limitations:
- Should be stored out of weather.
- Should not be used in lieu of high-flow drainage mat if it is required.

4. TECHNICAL DATA

Properties: See chart
Coverages: See chart

Specification Writer:
Contact EPRO Services before writing specifications on this product. Test information available upon request.

5. INSTALLATION

Preparation & Application: Should be applied in accordance with specific application guide specifications.

Tools: No special tools required for installation.

6. AVAILABILITY AND COST

Contact the local distributor or Authorized Applicator for availability and cost.

7. WARRANTY

Limited Warranty: 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.

8. MAINTENANCE

No maintenance required.

9. TECHNICAL SERVICES AND INFORMATION

Complete technical services and information are available from EPRO Services.

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ECOSHIELD - PP

Does A Lot More Than Provide Protection

High Strength Laminated Polypropylene Geomembrane

- High puncture resistance (Class A rating)...provides maximum protection and durability.
- Permeable to water vapor (micro-peforated).
- Provides an excellent substrate for grouts, mortar and concrete to adhere to.
- Large roll sizes (12' x 150') minimize seams.
- Reinforces the spray or fluid applied membrane.

Ecoshield-PP Physical Properties	Test Method	
Film		White HDPE Film Polyproplene Non-Woven
Grab Tensile Strength	ATSM D-882	24 lb/in
Grab Tensile Elongation	ATSM D-882	500%
PP Tear	ATSM D-2582	17.6 lbs
Puncture	ASTM D-1709	1.1 lbs
UV Resistance	ASTM D-4355	70% (after 150 hrs. exposure)
Light Reflectance	ASTM E-97	70%

Packaging Size: 12' x 150', Weight: 108 lbs.

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ECOSHIELD-PP Specifications

1. PRODUCT NAME

ECOSHIELD-PP

2. MANUFACTURER

EPRO SERVICES, INC.
P.O. Box 347
Derby, KS 67037
PHONE: 800-882-1896
FAX: 316-262-2529

3. PRODUCT DESCRIPTION

Basic Use:
ECOSHIELD-PP has been specifically designed to provide cost effective and high performance protection for the waterproofing membrane on horizontal waterproofing applications. The fabric also provides an excellent substrate for thin set grouts, mortar and concrete to bond to. When used in detailing of specific water penetration points (i.e. cold joints, footings, and pipes), it enhances the tensile strength of the other detailing products.

Composition:
ECOSHIELD-PP is an extremely tough, high strength geomembrane made from the lamination of HDPE film and unwoven polypropylene fabric.

Benefits:
- Permeable to water…offers additional relief from hydrostatic water pressure and resistance to earth contaminates.
- Provides better cured grout, mortar & concrete by retaining a water line.
- Minimal seams with 12'x 150' rolls.
- High puncture resistance protects waterproofing from subsequent construction damage.
- Excellent substrate for grout, mortar and concrete to adhere to.

Limitations:
- Should be stored out of weather.
- Should not be used in lieu of high-flow drainage mat if it is required.

4. TECHNICAL DATA

Properties: See chart
Coverages: See chart

Specification Writer:
Contact EPRO Services before writing specifications on this product. Test information available upon request.

5. INSTALLATION

Preparation & Application: Should be applied in accordance with specific application guide specifications.

Tools: No special tools required for installation.

6. AVAILABILITY AND COST

Contact the local distributor or Authorized Applicator for availability and cost.

7. WARRANTY

Limited Warranty: 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.

8. MAINTENANCE

No maintenance required.

9. TECHNICAL SERVICES AND INFORMATION

Complete technical services and information are available from EPRO Services.

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ECOSHIELD - PB

Protection Plus Waterproofing

HDPE (with fabric) and Bentonite Laminated Geomembrane

- High puncture resistance ...provides maximum protection and durability.
- Impermeable to water and gases (methane).
- Provides an excellent substrate for concrete to adhere to.
- Reinforces the spray of fluid applied membrane.
- Self sealing.

PROPERTIES	TEST METHOD	
Membrane		
Film		HDPE / Fabric Geomembrane
Puncture-Propagation Tear Resistance	ASTM D 2582	7.7 lbs. (3,500 gm)
Tensile Strength: Membrane (psi)	ASTM D 882	6,100 psi (42 Mpa)
% Elongation at break	ASTM D 882	100%
Bentonite		Sodium Montmarilonite (>90%)
Overall Weight		0.6 per sq. ft. (2.44 kg/m^2)
Resistance	ASTM D 751 Procedure A	174 ft. (52.9m) of water
Crack Bridging		1/8" (.032 cm) crack
Water Vapor Permeability	ASTM E 96	0.53 x 10^{-13} cm/sec 0.84 ng/m^2.s. Pa 0.033 Perms (grains/ft^2. hr. in Hg)
Installed System		
Puncture Resistance Of Membrane	ASTM D 781	110 Kg/CM
Puncture Resistance Of Composite	ASTM E 154	40 Min. LBS
Tensile Strength Of Composite	ASTM D 412 Modified Die C	750 PSI Min.
Elongation-Ultimate Failure Of Rubberized Asphalt	ASTM D 412 Modified Die C	400% Min.
Water Vapor Transmission Permeance	ASTM E 96 Method B	0.1 Max. Grains/SF/Hr in Hg

Roll Size: 3.5' x 36', **Weight:** 75 lbs.

EPRO SERVICES, INC.
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Phone: 800-882-1896
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Web: www.eproserv.com

ECOSHIELD-PB Specifications

1. PRODUCT NAME

ECOSHIELD-PB

2. MANUFACTURER

EPRO SERVICES, INC.
P.O. Box 347
Derby, KS 67037
PHONE: 800-882-1896
FAX: 316-262-2529

3. PRODUCT DESCRIPTION

Basic Use:
ECOSHIELD-PB has been specifically designed to provide cost effective and high performance protection for the waterproofing membrane on composite waterproofing systems as well as a self sealing waterproofing layer. The fabric also provides an excellent substrate for concrete to bond to. When used in detailing of specific water penetration points (i.e. cold joints, footings, and pipes), it enhances the tensile strength of the other detailing products. It is also to be used as a superior performing vapor and gas barrier underslab.

Composition:
ECOSHIELD-PB is an extremely tough, high strength geomembrane made from the lamination of HDPE film and unwoven polypropylene fabric and chemically bonded bentonite granules and fabric.

Benefits:
- Impermeable to water…offers additional relief from hydrostatic water pressure and resistance to earth contaminates.
- Provides better cured grout, mortar & concrete by retaining a water line.
- Self sealing..
- High puncture resistance protects waterproofing from subsequent construction damage.
- Excellent substrate for concrete to adhere to.

Limitations:
- Should be stored out of weather.
- Should not be used in lieu of high-flow drainage mat if it is required.

4. TECHNICAL DATA

Properties: See chart
Coverages: See chart

Specification Writer:
Contact EPRO Services before writing specifications on this product. Test information available upon request.

5. INSTALLATION

Preparation & Application: Should be applied in accordance with specific application guide specifications.

Tools: No special tools required for installation.

6. AVAILABILITY AND COST

Contact the local distributor or Authorized Applicator for availability and cost.

7. WARRANTY

Limited Warranty: 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.

8. MAINTENANCE

No maintenance required.

9. TECHNICAL SERVICES AND INFORMATION

Complete technical services and information are available from EPRO Services.

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epro™
Waterproofing Systems

07 14 10 / 2.02B3

epro™ Waterproofing Systems

Ecoflex-F Double Sided

Epro Services, Inc.'s ECOFLEX-F DOUBLE SIDED membrane is a 60-mil reinforced, modified asphalt sheet good with double sided adhesive around irregular transitions and voids. (Inappropriate for polyester an Ecoline detailing).enhances the bonding between preformed sealants and concrete surfaces aiding in the installation process. Stops water penetration of the concrete. Conveniently applied at the job site.

Ecoflex-F is cold applied an when pressed against the substrate will adhere firmly. Its self-adhering quality allows easy installation on concrete, block, aluminum, steel, exterior gypsum sheathing or wood.

ADVANTAGES

- Resists mechanical damage.
- Provides a seal for irregular surfaces.
- Self-adhering.
- Compatible will Ecoline-S and R.
- Easy to install.

STORAGE

Protect materials from excessive heat and cold. Store away from open flames, sparks or welding. For outside storage, protect cartons from rain, direct sunlight or other harmful environmental conditions.

PACKAGING

4"x100' (33.3 sq. ft.) rolls, 6 rolls per carton.
6"x100' (50 sq. ft.) rolls, 4 rolls per carton.
1"x100' (100 sq. ft.) rolls, 2 rolls per carton
36"x100 (225 sq. ft.) rolls, 1 roll per carton.

LIMITATIONS

- Not recommended where Ecoline and polyester reinforcement is applicable.
- Not recommended in areas where membrane will be subject to continuous exposure to sunlight or to temperatures in excess of 180° F.
- Concrete, masonry and some exterior gypsum substrates require priming for best results.
- Do not apply primer or membrane to frozen surfaces. Best results are obtained when membrane is installed at temperatures above 40° F.
- Do not apply primer or membrane to damp, frosty or contaminated surfaces.

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Product Data Sheet
Edition 9.13.2012
Sikaflex-1a

07 14 10 / 2.02B9

SEALANT- WATERPROOFING & RESTORATION INSTITUTE
Issued to: Sika Corporation
Product: Sikaflex®-1A
C719: Pass ✔ Ext:+35% Comp -35%
Substrate: Mortar, Aluminum, Glass
[illegible]
C661: Rating 40
Validation Date: 8/3/12 – 8/2/17
No. 0312-S11211 Copyright © 2012
SEALANT VALIDATION
www.swrionline.org

Sikaflex®-1a

One part polyurethane, elastomeric sealant/adhesive

Construction

Description

Sikaflex-1a is a premium-grade, high-performance, moisture-cured, 1-component, polyurethane-based, non-sag elastomeric sealant. Meets Federal specification TT-S-00230C, Type II, Class A. Meets ASTM C-920, Type S, Grade NS, Class 35, use T, NT, O, M, G, I; Canadian standard CAN/CGSB 19.13-M87.

Where to Use

- Designed for all types of joints where maximum depth of sealant will not exceed 1/2 in.
- Excellent for small joints and fillets, windows, door frames, reglets, flashing, common roofing detail applications, and many construction adhesive applications.
- Suitable for vertical and horizontal joints; readily placeable at 40°F.
- Has many applications as an elastic adhesive between materials with dissimilar coefficients of expansion.
- Submerged conditions, such as canal and reservoir joints.

Advantages

- Eliminates time, effort, and equipment for mixing, filling cartridges, pre-heating or thawing, and cleaning of equipment.
- Fast tack-free and final cure times.
- High elasticity - cures to a tough, durable, flexible consistency with exceptional cut and tear-resistance.
- Stress relaxation.
- Excellent adhesion - bonds to most construction materials without a primer.
- Excellent resistance to aging, weathering.
- Proven in tough climates around the world.
- Odorless, non-staining.
- Jet fuel resistant.
- Certified to the NSF/ANSI Standard 61 for potable water.
- Urethane-based; suggested by EPA for radon reduction.
- Paintable with water-, oil- and rubber-based paints.
- Capable of ±35% joint movement.

Coverage

10.1 fl. oz. cartridge seals 12.4 lineal ft. of 1/2 x 1/4 in. joint. 20 fl. oz. uni-pac sausage seals 24 lineal ft. of 1/2 x 1/4 in. joint.

Packaging

Disposable 10.1 fl. oz., moisture-proof composite cartridges, 24/case; and uni-pac sausages, 20 fl. oz., 20/carton.

Typical Data *(Material and curing conditions @ 73°F (23°C) and 50% R.H.)*

RESULTS MAY DIFFER BASED UPON STATISTICAL VARIATIONS DEPENDING UPON MIXING METHODS AND EQUIPMENT, TEMPERATURE, APPLICATION METHODS, TEST METHODS, ACTUAL SITE CONDITIONS AND CURING CONDITIONS.

Shelf Life	10.1 fl. oz. cartridges	12 months
	20 fl. oz. uni-pac sausages	12 months
	5 gallon pail	6 months
	55 gallon drum	6 months
Storage Conditions	Store at 40°-95°F (4°-35°C). Condition material to 65°-75°F before using.	
Colors	White, colonial white, aluminum gray, limestone, black, dark bronze, capitol tan, stone and medium bronze. Special architectural colors on request.	
Application Temperature	40° to 100°F. Sealant should be installed when joint is at mid-range of its anticipated movement.	
Service Range	-40° to 170°F	
Curing Rate	Tack-free time	3 to 6 hours
	Tack-free to touch	3 hours
	Final cure	4 to 7 days
Tear Strength (ASTM D-624)	55 lb./in.	
Shore A Hardness (ASTM C-661)	21 day	40±5
Movement Capability (ASTM C-719)	+/- 35%	

Tensile Properties (ASTM D-412)

21 day	Tensile Stress		175 psi (1.21 MPa)
	Elongation at Break		550%
	Modulus of Elasticity	25%	35 psi (0.24 MPa)
		50%	60 psi (0.41 MPa)
		100%	85 psi (0.59 MPa)

Adhesion in Peel (TT-S-00230C, ASTM C 794)

Substrate	Peel Strength	Adhesion Loss
Concrete	20 lb.	0%
Aluminum	20 lb.	0%
Glass	20 lb.	0%

Weathering Resistance Excellent

Chemical Resistance Good resistance to water, diluted acids, and diluted alkalines. Consult Technical Service for specific data.

How to Use

Surface Preparation

Clean all surfaces. Joint walls must be sound, clean, dry, frost-free, and free of oil and grease. Curing compound residues and any other foreign matter must be thoroughly removed. A roughened surface will also enhance bond. Install bond breaker tape or backer rod to prevent bond at base of joint.

Priming

Priming is not usually necessary. Most substrates only require priming if testing indicates a need or where sealant will be subjected to water immersion after cure.

Consult Sikaflex Primer Technical Data Sheet or Technical Service for additional information on priming.

Application

Recommended application temperatures: 40°-100°F. For cold weather application, condition units at approximately 70°F; remove prior to using.

For best performance, Sikaflex-1a should be gunned into joint when joint slot is at mid-point of its designed expansion and contraction.

Place nozzle of gun into bottom of the joint and fill entire joint. Keep the nozzle in the sealant, continue on with a steady flow of sealant preceding the nozzle to avoid air entrapment.

Avoid overlapping of sealant to eliminate entrapment of air. Tool sealant to ensure full contact with joint walls and remove air entrapment. Joint dimension should allow for 1/4 inch minimum and 1/2 inch maximum thickness for sealant. Proper design is 2:1 width to depth ratio.

For use in horizontal joints in traffic areas, the absolute minimum depth of the sealant is 1/2 in. and closed cell backer rod is recommended.

Linear Feet of Sealant per Gallon

Width (Inches)	Depth ½	Depth ¼
¼	308.0	
½	154.0	77.0
¾	102.7	51.3
1	77.0	38.5
1¼	61.6	30.8
1½	51.3	25.7

Limitations

- Allow 1-week cure at standard conditions when using Sikaflex-1a in total water immersion situations and prior to painting.
- When overcoating with water, oil and rubber based paints, compatibility and adhesion testing is essential.
- Avoid exposure to high levels of chlorine. (Maximum continuous level is 5 ppm of chlorine.)
- Maximum depth of sealant must not exceed 1/2 in.; minimum depth is 1/4 in.
- Maximum expansion and contraction should not exceed 25% of average joint width.
- Do not cure in the presence of curing silicone sealants.
- Avoid contact with alcohol and other solvent cleaners during cure.
- Do not apply when moisture-vapor-transmission condition exists from the substrate as this can cause bubbling within the sealant.
- Use opened cartridges and uni-pac sausages the same day.
- When applying sealant, avoid air-entrapment.
- Since system is moisture-cured, permit sufficient exposure to air.
- White color tends to yellow slightly when exposed to ultraviolet rays.
- Light colors can yellow if exposed to direct gas fired heating element.
- The ultimate performance of Sikaflex-1a depends on good joint design and proper application with joint surfaces properly prepared.
- The depth of sealant in horizontal joints subject to traffic is 1/2 in.
- Do not tool with detergent or soap solutions.
- Do not use in contact with bituminous/asphaltic materials.

Caution

WARNING: IRRITANT, SENSITIZER. Contains Polyisocyanate Prepolymer (Mixture), Xylene (CAS 1330-20-7). Causes eye irritation. May cause skin/respiratory irritation. May cause skin and/or respiratory sensitization after prolonged contact. May be harmful if swallowed. Reports have associated repeated and prolonged exposure to some of the chemicals in this product with permanent brain, liver, kidney and nervous system damage. Headaches and dizziness may result. **Deliberate misuse by inhalation of vapors may be harmful or fatal. Strictly follow all usage, handling and storage instructions.**

Handling & Storage

Avoid direct contact. Wear personal protective equipment (chemical resistant goggles/gloves/clothing) to prevent direct contact with skin and eyes. Use only in well ventilated areas. Open doors and windows during use. Use a properly fitted NIOSH respirator if ventilation is poor. Wash thoroughly with soap and water after use. Remove contaminated clothing and launder before reuse. Store in cool dry well ventilated area.

Cleanup

Use personal protective equipment (chemical resistant gloves/goggles/clothing). Without direct contact, remove spilled or excess product and placed in suitable sealed container. Dispose of excess product and container in accordance with applicable environmental regulations.

First Aid Measures

Eyes: Hold eyelids apart and flush thoroughly with water for 15 minutes. **Skin:** Remove contaminated clothing. Wash skin thoroughly for 15 minutes with soap and water. **Inhalation:** Remove to fresh air. **Ingestion:** Do not induce vomiting. Dilute with water. Contact physician. **In all cases contact a physician immediately if symptoms persist.**

Visit our website at www.sikausa.com

1-800-933-SIKA NATIONWIDE

Regional Information and Sales Centers. For the location of your nearest Sika sales office, contact your regional center.

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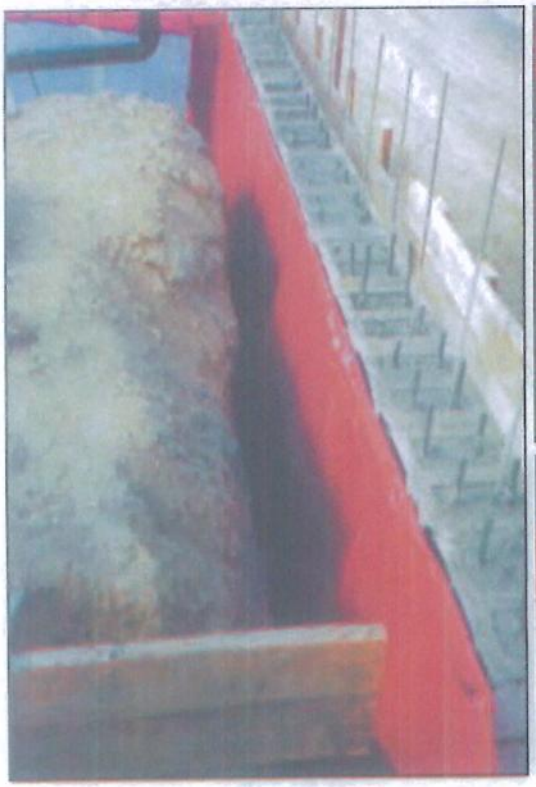
Fax: 514-694-2792

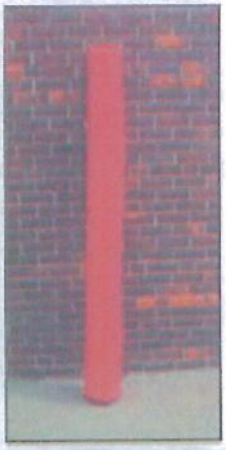
Sika Mexicana S.A. de C.V.
Carretera Libre Celaya Km. 8.5
Fracc. Industrial Balvanera
Corregidora, Queretaro
C.P. 76920
Phone: 52 442 2385800
Fax: 52 442 2280537

Printed in Canada.

ECOSHIELD-E Sheet Membrane

IS TOUGH TO BEAT FOR PROTECTION





High Strength Polyolefin Geomembrane Protection

- High puncture resistance... has six times the puncture resistance of extruded foam board.
- Impermeable to water...additional relief from hydrostatic water pressure, resistance to contaminates.
- Durable...resistant to installation and backfill damage.
- 12'x120' rolls minimize seams.
- Protects membrane, acts as a slip-sheet for backfill and drainage mat.
- Under slab vapor barrier.

PROPERTIES	ASTM	Thickness: 8 mil	Thickness: 10 mil	Thickness: 15 mil
Classification:	ASTM E-1745	Class C	Class A, B & C	Class A, B & C
Water Vapor Permeance	ASTM E-96	0.014 perms	0.0046 perms	0.0038 perms
Tensile Strength	ASTM E-154 (ASTM D-882)	24.59 lbf/in	54 lbf/in	93 lbf/in
Puncture Resistance	ASTM D-1709	876 grams	3,905 grams	5,300 grams
Life Expectancy	ASTM E-154	Indefinite	Indefinite	Indefinite
Chemical Resistance	ASTM E-154	Unaffected	Unaffected	Unaffected
Low Temperature Impact	ASTM D-1790	Resistant to: -105°C	Resistant to: -105°C	Resistant to: -105°C
Methane Gas Modified	ASTM D-1434	0	0	0
ACI 302.1 R-96 Minimum Thickness 10-mils		Less than 10-mils	Exceeds	Exceeds

Ecoshield-E Meets or exceeds additional American Standard Testing Material (ASTM) Specifications:

ASTM D-1248 Standard Specification for polyethylene plastic
ASTM D-2103 Standard Specification for polyethylene film and sheeting
ASTM D-4397 Polyethylene sheeting for construction, industrial and agricultural application
ASTM E-154 Materials for use as vapor barriers under concrete slabs
ASTM C-156 As ground cover in crawl spaces

APPROVALS: City of Los Angeles Research Report #25478 for methane barrier.

Packaging: Available in the following roll dimensions: **8 mil - 6' x 120', 8' x 120', 10' x 120', 10 mil - 12' x 120' , 15 mil - 12' x 120'**

EPRO SERVICES
P.O. Box 347
Derby, KS 67037 USA

A World of Difference
epro™
Waterproofing Systems

Phone: 800-882-1896
Fax: 316-262-2529
www.eproserv.com

ECOSHIELD-E 8, 10 & 15 Specifications

1. PRODUCT NAME

ECOSHIELD-E8
ECOSHEILD-E10
ECOSHIELD-E15

2. MANUFACTURER

EPRO SERVICES, INC.
P.O. Box 347
Derby, KS 67037
PHONE: 800-882-1896
FAX: 316-262-2529

3. PRODUCT DESCRIPTION

Basic Uses: (1) Ecoshield-E8, 10 and 15 have been specifically designed to provide a cost effective and high performance protection course for both vertical and horizontal below grade waterproofing membranes. They also act as a slip sheet for backfill and as a secondary independent waterproofing barrier. When used in detailing for specific water penetration points (i.e. cold joints, brick ledges, pipes), they enhance the tensile strength of the other detailing products.
(2) Ecoshield-E 8, 10 & 15 are high performance under slab vapor barriers. The Ecoshield-E 10 & 15 barriers exceed the requirements of ASTM E 1745 class A, B, and C. Ecoshield-E 8 exceeds the requirements of class C.

Composition: ECOSHIELD-E 8, 10 & 15 are extremely tough, high strength geo-membranes made from a custom blend of polyolefin copolymers.

Benefits:
- High puncture resistance – has six times the puncture resistance of extruded foam board.
- Impermeable to water…offers additional relief from hydrostatic water pressure and resistance to earth contaminates.
- Durable…resistant to installation and backfill damage.
- Large roll sizes minimize seams.
- Protects membrane – acts as slip-sheet for backfill and drainage mat.
- Fully protects membrane at brick ledge and at footer to drain pipe.
- Easy to incorporate into detailing specific penetration points with other products.

Limitations:
- Should be stored out of weather.
- Should not be used in lieu of high-flow drainage mat if it is required .

4. TECHNICAL DATA

Properties: See chart.

Coverages: See chart.

Specification Writer: Contact EPRO Services before writing specifications on this product. Test information available upon request.

5. INSTALLATION

Preparation & Application: Should be applied in accordance with specific application guide specifications.

Tools: No special tools required for installation.

6. AVAILABILITY AND COST

Contact the local distributor and/or Authorized Applicator for availability and cost.

7. WARRANTY

Limited Warranty: 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.

8. MAINTENANCE

No maintenance required.

9. TECHNICAL SERVICES AND INFORMATION

Complete technical services and information are available from EPRO Services.

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EproSTOP-HPL Waterproofing Accessory

1. *PRODUCT NAME*

EPROSTOP-HPL

2. *MANUFACTURER*

EPRO SERVICES, INC.
P. O. Box 347
Derby, KS 67037
PHONE: 800-882-1896
FAX: 316-262-2620

3. *PRODUCT DESCRIPTION*

Basic Use: EPROSTOP-HPL is designed to self seal joints in many forms of concrete and concrete construction such as cold joints, penetrations, etc. when exposed to moisture thus, maintaining water tight integrity.

Composition: EPROSTOP-HPL is a rubber based product that has been formulated with special hydrophilic compounds that are intended to expand in a controlled fashion when exposed to moisture.

Benefits:

- Does not over expand which can cause self deterioration.
- Does not over stress adjoining substrate material.
- Excellent resistance to hydration/dehydration cycle damage.
- Wide range of application temperatures.
- Wide range of service temperatures.

Limitations:

- Store in dry area.
- Do not install in inclement weather.
- Do not install in temperatures over 120°F.

4. *TECHNICAL DATA*

Properties: See chart.

Coverages: See chart.

Specification Writer: Contact EPRO Services before writing specifications on this prjduct. Test information available upon request.

5. *INSTALLATION:*

- Treat uncured concrete with EPRO PRIMER prior to installation.
- Place material at least 1 ½" from edge of concrete.

6. *AVAILABILITY AND COST*

Contact the local distributor and/or Authorized Applicator for availability and cost.

7. *WARRANTY*

Limited Warranty: 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.

8. *MAINTENANCE*

No maintenance required.

9. *TECHNICAL SERVICES AND INFORMATION*

Complete technical service and information are available from EPRO Services.

TECHNICAL DATA

Specific Gravity	ASTM D 71	1.35 + 5
Hydrocarbon Content	ASTM D 4	47% min.
Volatile Matter	ASTM D 6	1% max.
Penetratio, cone 77°F, 150 gm 5 sec.	ASTM D 217	40 + 5

Packaging: 3/4" x 1" x 16'8" ea.
6 per case
40 cases per skid

epro™ Waterproofing Systems

EPRO Polyester-160

Chemical	Exposure (at room temperature)	% Retained Strength
Dimethyl Formamide	1,000 hrs.	100%
Ethylene Glycol	1,000 hrs.	100%
1% Sodium Hydroxide	6 hrs.	100%
60% Sulfuric Acid	150 hrs.	54%
Perchlorethylene	1,000 hrs.	100%
Acetone	1,000 hrs.	100%
Distilled Water	1,000 hrs.	100%
Physical Property Data		
Weight/Square (lbs.)	ASTM D 3776	1.1
Oz../Sq./Yd. (oz.)	ASTM D 3776	1.6
Bulk (mils)		22
Dry Tensile - MD (lbs.)	ASTM D 1777	25
Dry Tensile - CD (lbs.)	ASTM D 1777	18
Elongation - MD (per cent)	ASTM D 1682	45
Elongation - CD (per cent)	ASTM D 1682	100
Mullen Burst	ASTM D 3786	35

EPRO Polyester-160 Specifications

1. PRODUCT NAME

EPRO Polyester-160

2. MANUFACTURER

EPRO SERVICES
P.O. Box 347
Derby, KS 67037
PHONE 800-882-1896
FAX: 316-794-3451

3. PRODUCT DESCRIPTION

Basic Use: EPRO Polyester is designed to act as reinforcement when used in conjunction with Epro spray and fluid applied membranes.

Composition: EPRO Polyester spun laced fabric is a textile material composed of staple fibers hydraulically entangled, which is composed of 100% polyester.

Benefits:

- Excellent comformability and elongation.
- Light weight.
- High tensile strength.
- Exceptional tear resistance.
- Good chemical resistance.
- Non-reaveling.
- Open aperture allows saturation.

Limitations:
- Not to be used when elongation and movement is not desired.

Properties: See chart.

Coverages: See chart.

- Specification Writer:

Contact EPRO Services before writing specifications on this project. Test information available upon request.

4. INSTALLATION

Preparation: Must include but not limited to: • All surfaces should be dry and free of loose materials, release oils and other contaminants. These should be removed prior to application by power washing or other suitable methods.
• Repairs: Any cracks, spall or metal protrusion areas should be repaired by trowel application of ECOLINE-T insuring penetration of materials in damaged or cracked area. Large cracks may also require a layer of fiberglass mesh or polyester mat being spanned over crack and ECOLINE-T applied over this to provide additional membrane strength.
• A test should always be done prior to application using tho same cleaning preparation and application procedures to be used on the project.

Cleaning: Not applicable.

5. AVAILABILITY AND COST:

Contact the local distributor and/or Authorized Applicator for availability and cost.

6. WARRANTY

Limited Warranty: 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.

7. MAINTENANCE:

No maintenance required.

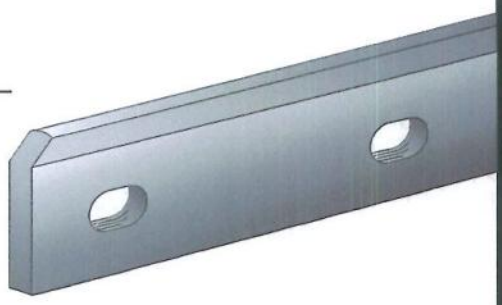
8. TECHNICAL SERVICES AND INFORMATION:

Complete technical services and information are available from EPRO Services.

A World of Difference epro™ Waterproofing Systems

TECHNICAL DATA

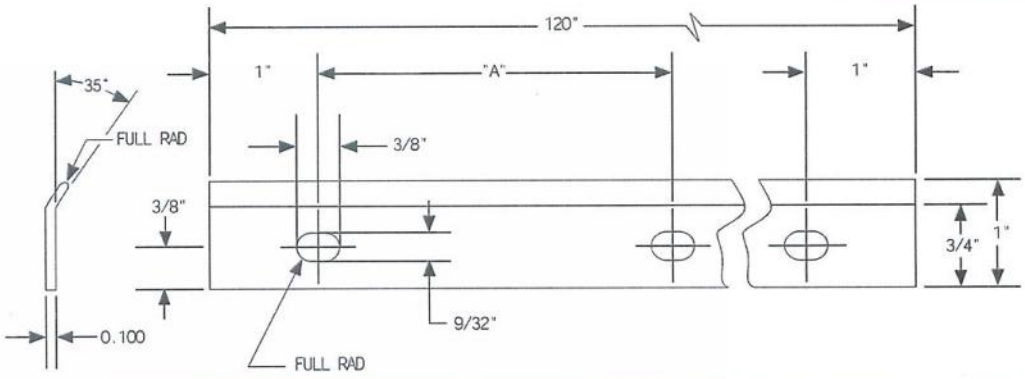
TB-100 Termination Bar



- **Feature:** Comes with sealant ledge.
- **Material:** Made from specially extruded aluminum without sharp edges. Manufactured to mill tolerances.
- **Slotted Holes:** Comes with holes either 6", 8" or 12" on center.

Part No.	"A"
TB-100-6	5.9
TB-100-8	7.8
TB-100-12	11.8

TECHNICAL DRAWING

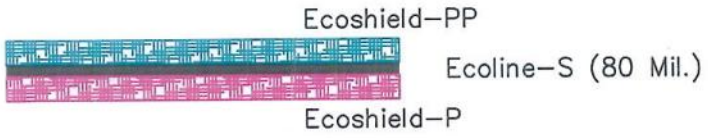


Part No.	Thickness*	Width*	Length*	Hole Size	Holes On Center	Pieces/Tube	Weight/Tube
TB-100-6	.100"	1"	10'	1/4 x 3/8"	6"	50	68#
TB-100-8	.100"	1"	10'	1/4 x 3/8"	8"	50	68#
TB-100-12	.100"	1"	10'	1/4 x 3/8"	12"	50	68#

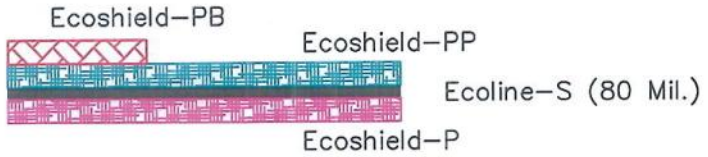
*Manufactured to mill tolerances.

TRUFAST Construction Fastening Solutions

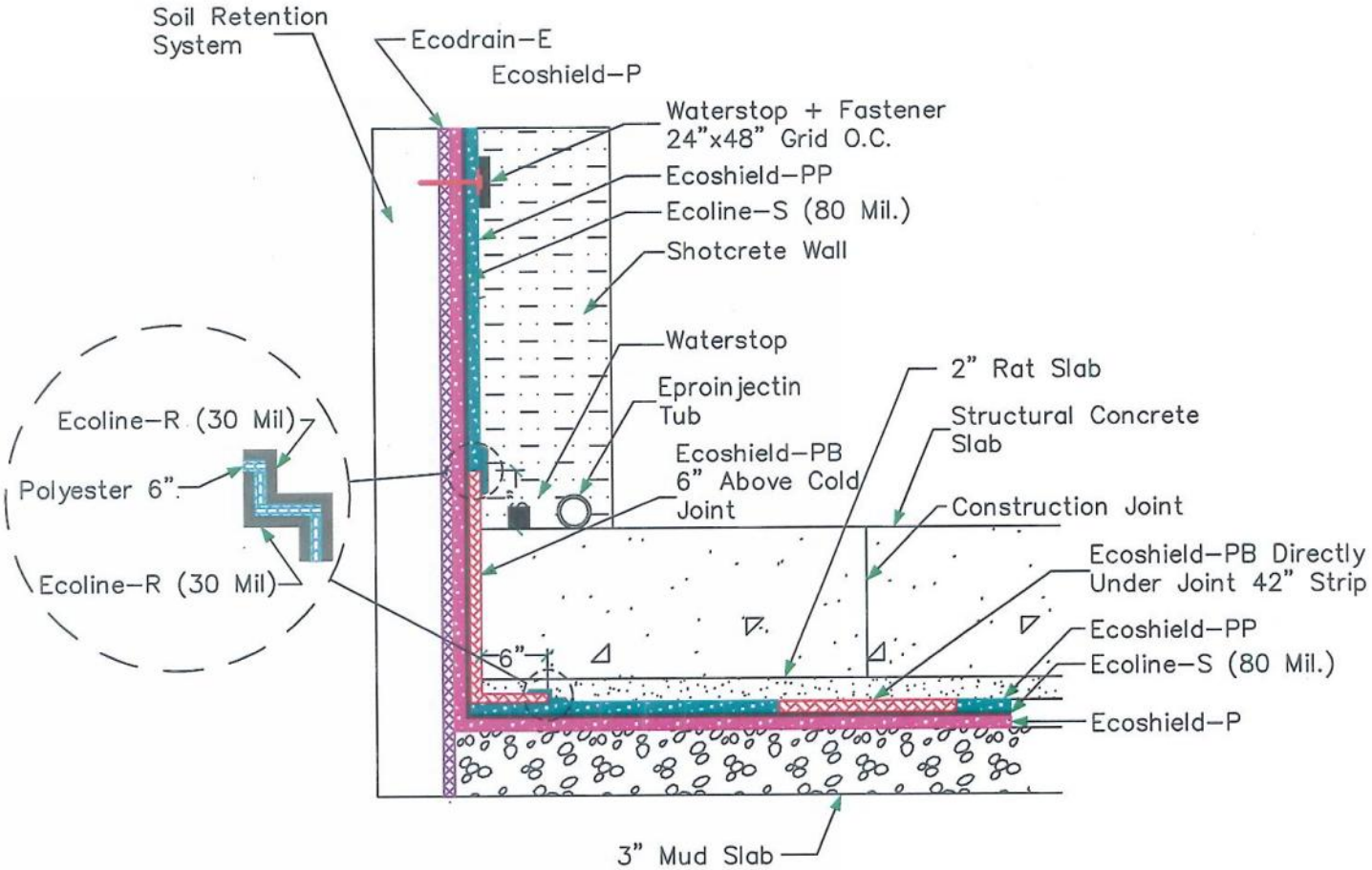
TRUFAST, LLC
02105 Williams Cty. Rd. 12-C
Bryan, Ohio 43506-9804
1-800-443-9602 • 419-636-6715 • Fax: 419-636-1784
WebSite: www.trufast.com • E-mail: sales@trufast.com



System 3 MB



System 3 MBB



UNDER SLAB TO BLINDSIDE TIE IN	epro™ Waterproofing Systems — A WORLD OF DIFFERENCE FOR REAL WORLD CONDITIONS	DWG 1

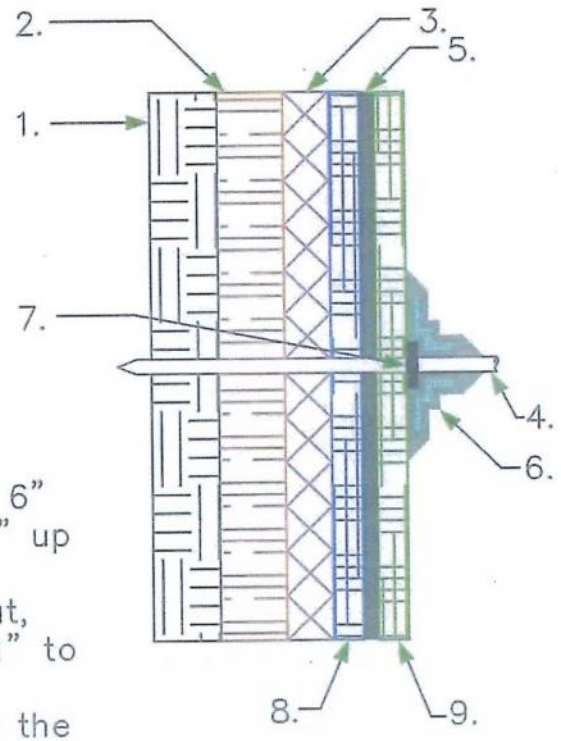
1. Soil
2. Lagging
3. Ecodrain–E or S
4. Rebar Anchor Stub
5. Ecoline–S (80 Mil)
6. Ecoline–R and Polyester
7. Ecostop–HDPL
8. Ecoshield–P
9. Ecoshield–PB

A. Insert Anchor Stud through 1"x1" piece Waterstop.

B. Apply a 30–mil base coat of Ecoline–S or Ecoline–R in a 6" radius on the Ecoshield–PP, around the penetration and 6" up the penetrating object.

C. Embed 6" polyester reinforcement fabric into the base coat, wrapping it around the penetration 3" onto the field and 1" to 3" up the penetration.

D. Apply a minimum 30–mil Ecoline–R coat around and onto the penetration



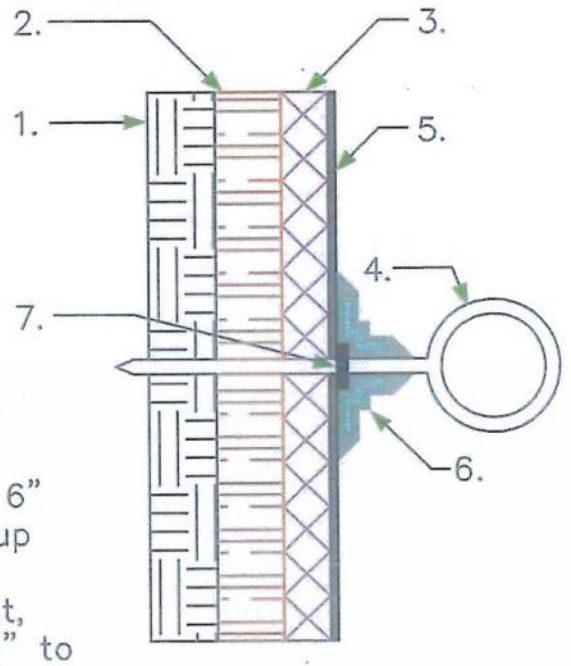
LAGGING WALL
REBAR ANCHOR

epro™ Waterproofing Systems

A WORLD OF DIFFERENCE FOR REAL WORLD CONDITIONS

DWG. 2

1. Soil
2. Lagging
3. Ecodrain–E
4. Rebar Anchor Stub
5. Ecoline–S (80 Mil)
6. Ecoline–R and Polyester
7. Ecostop–HDPL



A. Insert Anchor Stud through 1"x1" piece Waterstop.

B. Apply a 30–mil base coat of Ecoline–S or Ecoline–R in a 6" radius on the Ecodrain–E, around the penetration and 6" up the penetrating object.

C. Embed 6" polyester reinforcement fabric into the base coat, wrapping it around the penetration 3" onto the field and 1" to 3" up the penetration.

D. Apply a minimum 30–mil Ecoline–R coat around and onto the penetration

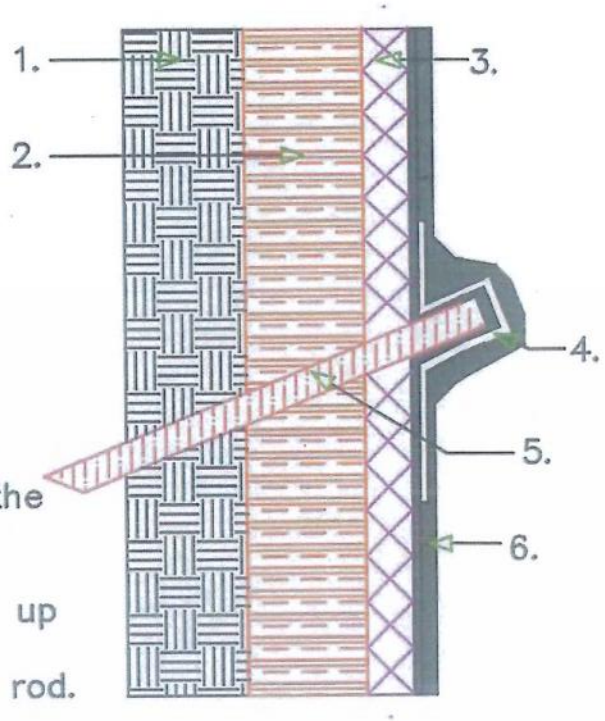
LAGGING WALL
REBAR ANCHOR STUD
PENETRATION

epro™ Waterproofing Systems

A WORLD OF DIFFERENCE FOR REAL WORLD CONDITIONS

DWG. 3

1. Soil
2. Soldier Beam
3. Ecodrain–E
4. Reinforcement fabric
5. Tie Back Rod
6. Ecoline–S



A. Trim the Ecodrain to within 1/8" of the tie back rod (should be as snug as possible).
B. Apply a 40-mil base coat of Ecoline–S or Ecoline–R in a 6" radius on the Ecodrain–E around the tie back rod and over the object.
C. Embed 6" polyester reinforcement fabric into the base coat, wrapping it around the tie back rod 3" onto the field and 3" up the tie back rod.
D. Apply a minimum 80-mil coat around and onto the tie back rod.

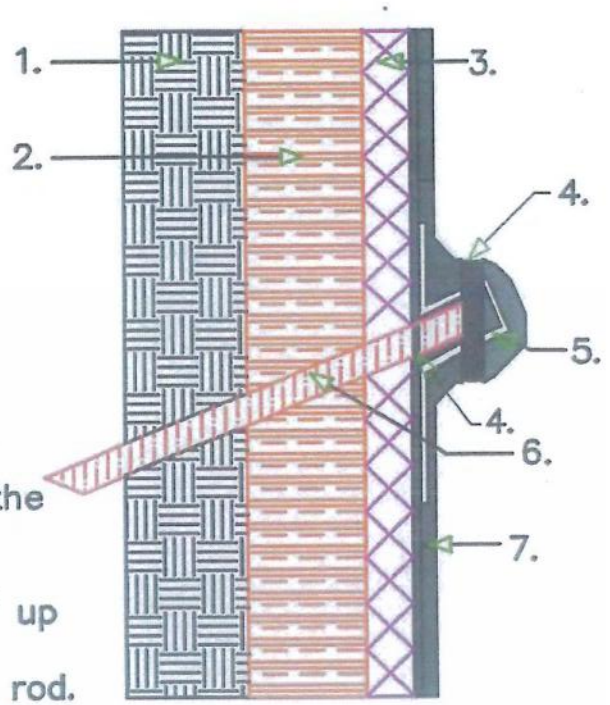
LAGGING WALL DETAIL TIE BACK NON WATERTABLE

epro™ Waterproofing Systems

A WORLD OF DIFFERENCE FOR REAL WORLD CONDITIONS

DWG. 4

1. Soil
2. Soldier Beam
3. Ecodrain–E
4. Eprostop–HPL
5. Reinforcement Fabric
6. Tie Back Rod
7. Ecoline–S



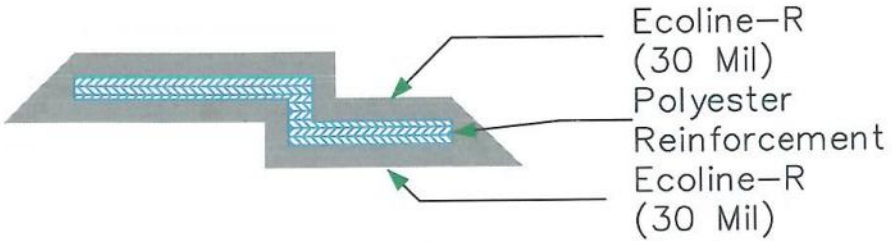
A. Trim the Ecodrain to within 1/8" of the tie back rod (should be as snug as possible).
B. Apply a 40-mil base coat of Ecoline–S or Ecoline–R in a 6" radius on the Ecodrain–E around the tie back rod and over the object.
C. Embed 6" polyester reinforcement fabric into the base coat, wrapping it around the tie back rod 3" onto the field and 3" up the tie back rod.
D. Apply a minimum 80-mil coat around and onto the tie back rod.
E. Secure the membrane and reinforcement fabric with a strip of Eprostop–HPL

LAGGING WALL DETAIL TIE BACK IN WATERTABLE

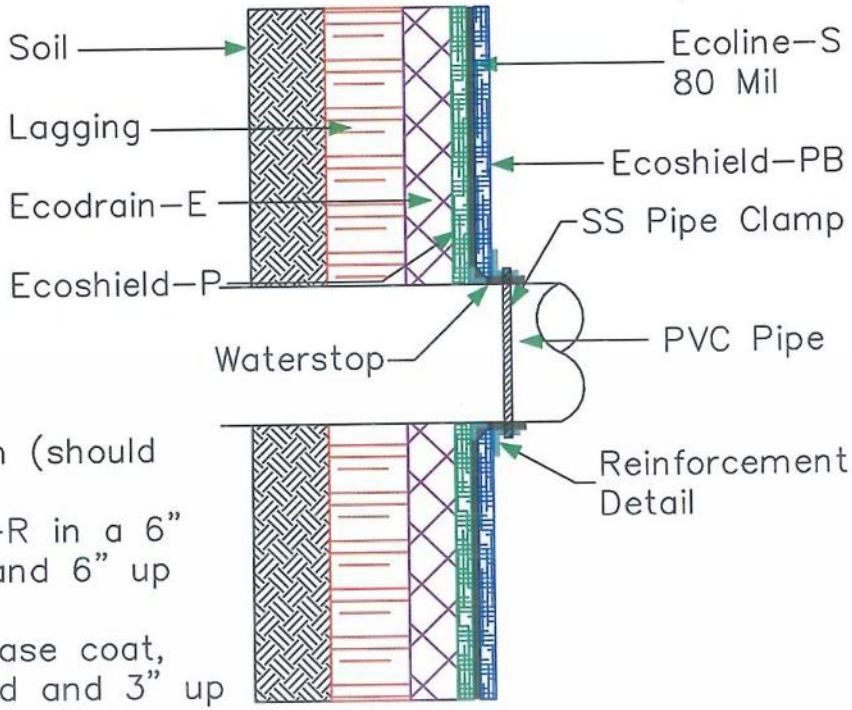
epro™ Waterproofing Systems

A WORLD OF DIFFERENCE FOR REAL WORLD CONDITIONS

DWG. 5

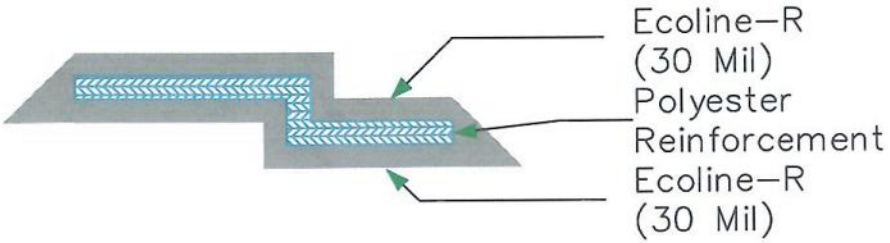


Reinforcement Detail

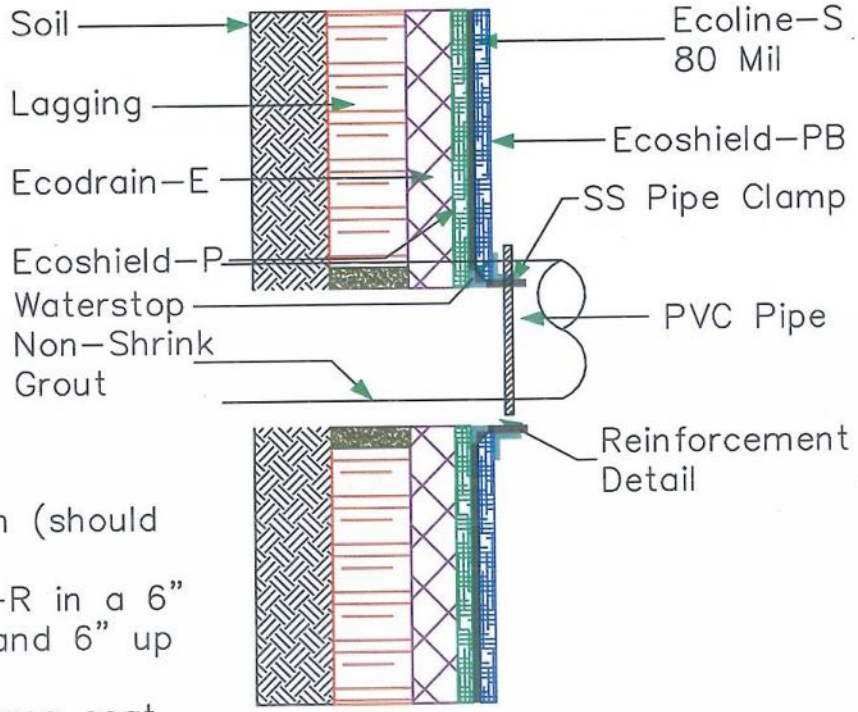


A. Trim the Ecodrain to within 1/8" of the penetration (should be as snug as possible).
B. Apply a 40–mil base coat of Ecoline–S or Ecoline–R in a 6" radius on the Ecodrain–E, around the penetration and 6" up the penetrating object.
C. Embed 6" polyester reinforcement fabric into the base coat, wrapping it around the penetration 3" onto the field and 3" up the penetration.
D. Apply a minimum 80–mil coat around and onto the penetration while creating a 45 degree cant at the base of the penetration.

PENETRATION DETAIL BLINDSIDE WATERTABLE	epro™ Waterproofing Systems A WORLD OF DIFFERENCE FOR REAL WORLD CONDITIONS	DWG. 6



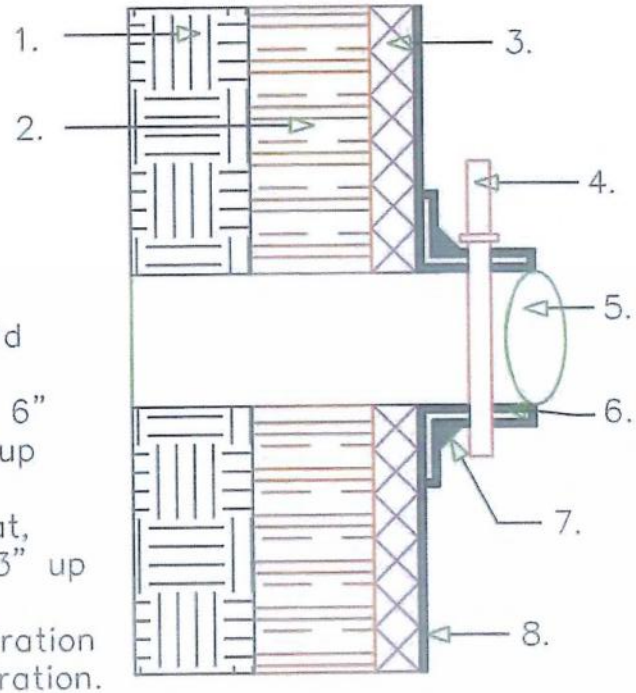
Reinforcement Detail



A. Trim the Ecodrain to within 1/8" of the penetration (should be as snug as possible).
B. Apply a 40–mil base coat of Ecoline–S or Ecoline–R in a 6" radius on the Ecodrain–E, around the penetration and 6" up the penetrating object.
C. Embed 6" polyester reinforcement fabric into the base coat, wrapping it around the penetration 3" onto the field and 3" up the penetration.
D. Apply a minimum 80–mil coat around and onto the penetration while creating a 45 degree cant at the base of the penetration.

PENETRATION DETAIL BLINDSIDE WATERTABLE	epro™ Waterproofing Systems — A WORLD OF DIFFERENCE FOR REAL WORLD CONDITIONS	DWG. 7

1. Soil
2. Lagging
3. Ecodrain–E
4. Nylon or Polypropylene cinch tie
5. Pipe
6. Ecoline–R
7. Ecoline–S (45 degree cant.)
8. Ecoline–S (**80** mil)

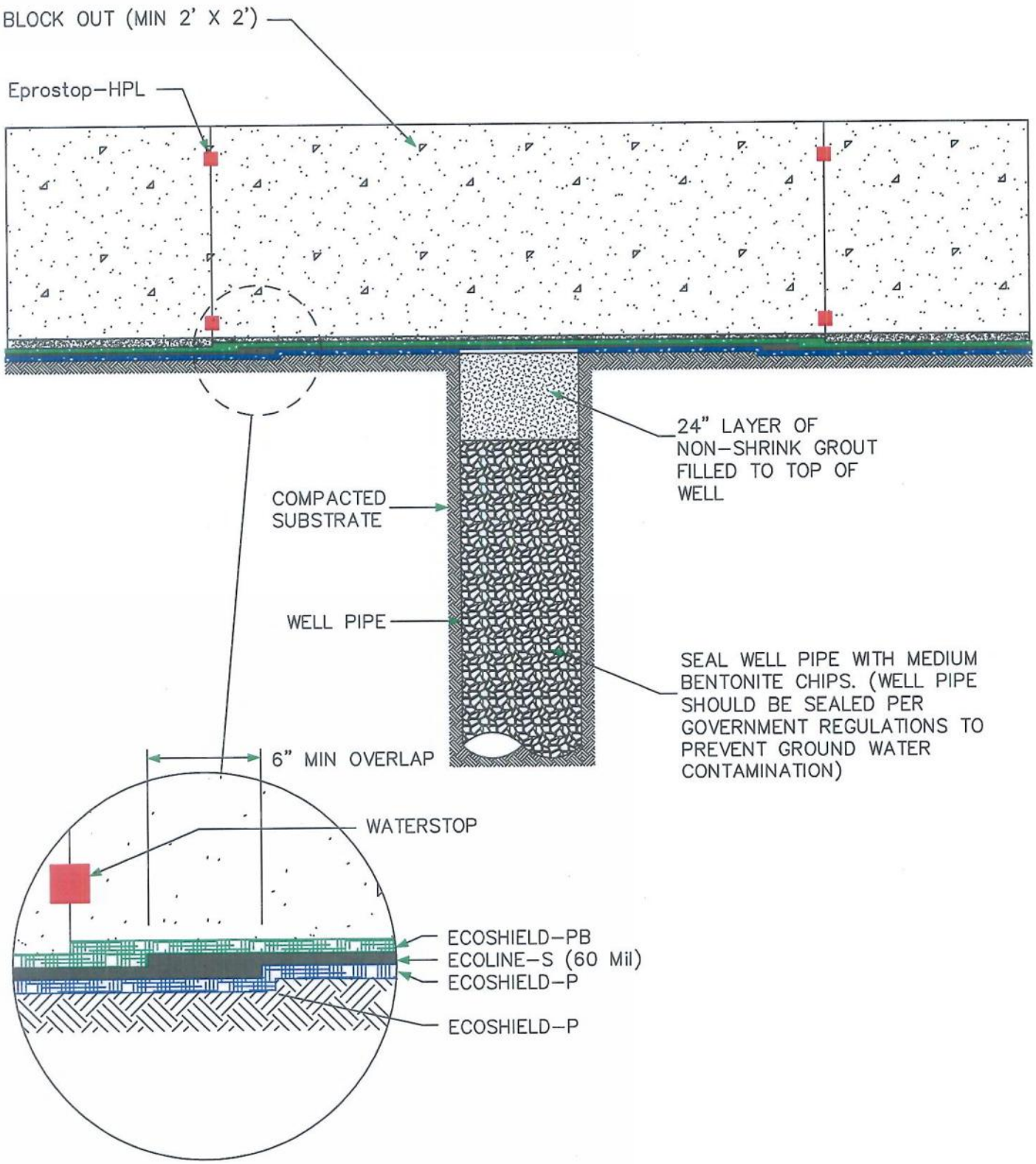


A. Trim the Ecodrain to within 1/8" of the penetration (should be as snug as possible).
B. Apply a **40** mil base coat of Ecoline–S or Ecoline–R in a 6" radius on the Ecodrain–E, around the penetration and 6" up the penetrating object.
C. Embed 6" polyester reinforcement fabric into the base coat, wrapping it around the penetration 3" onto the field and 3" up the penetration.
D. Apply a minimum **80** -mil coat around and onto the penetration while creating a 45 degree cant at the base of the penetration.
E. Secure the membrane and reinforcement fabric with a nylon or polypropylene cinch tie.

LAGGING WALL DETAIL PENETRATION NON WATERTABLE

epro™ Waterproofing Systems — A WORLD OF DIFFERENCE FOR REAL WORLD CONDITIONS

DWG. 8



BOX OUT/ ABANDONMENT OF DEWATERING WELLS

epro™ Waterproofing Systems

A WORLD OF DIFFERENCE FOR REAL WORLD CONDITIONS

DWG. 9

ATTACHMENT E

Mechanical Ventilation

MHC ENGINEERS
150 8th STREET SAN FRANCISCO, CA 94103
PH (415) 512-7141 / FAX (415) 512-7120
Email: general@mhcengr.com

April 25, 2013 #10-123

Mr. Maurice Casy
Bush Larkin LLC.

Re: 490 south Van Ness – Garage Ventilation

Dear Mr. Casy:

This is to advise you that the garage ventilation design for the subject project will be in accordance with current California Mechanical Code, 2010 CMC, Section 403.8.

The ventilation system will be 24/7 operation when designed to 0.75 CFM/SF as directed by DBI.

The garage is 14,000 SF with 11 ft ceiling height.
The ventilation system will provide one complete air change every 14.6 minutes or more than 4 air changes per hour.

Please do not hesitate to contact us if you have any further question about the ventilation design.

Sincerely,

Meng-Hsiu Chen, P.E.
MHC Engineers, Inc.
150 8th Street
SF, CA 94013