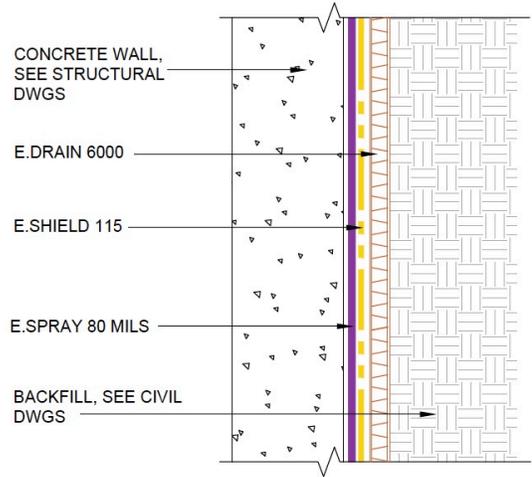
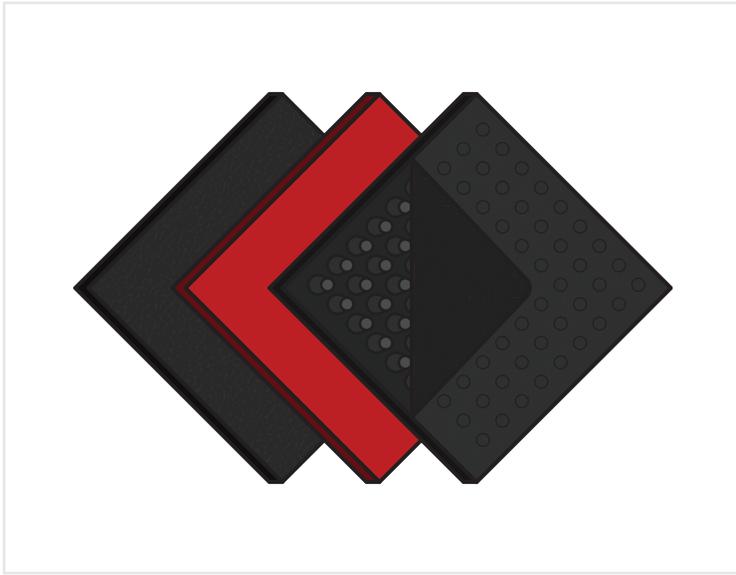


The background of the page is a grayscale photograph of a large-scale construction site. In the foreground, there is a deep, wide trench with a concrete wall on the right side. The wall is under construction, with numerous vertical rebar rods protruding from its top surface. In the middle ground, there are several long, rectangular concrete structures, possibly foundations or walls, also under construction. The background shows a range of hills or mountains under a clear sky. The entire image is overlaid with a semi-transparent dark gray filter.

**E.PROTECT
POST-APPLIED
SUBMITTAL PACKET**



System: E.Protect

Former System Name: System III-CW

Application: Walls

System Thickness: 95 mils

	1st Layer	2nd Layer	3rd Layer
Product Name	e.spray 80 mils dry	e.shield 115	e.drain 6000
Former Name	Ecoline-S	Ecoshield-E15	Ecodrain-S 6000

DESCRIPTION

E.Protect Wall is a redundant field-installed composite waterproofing, methane gas, and vapor intrusion barrier for below-grade post-applied vertical wall protection. Ideal for below-grade building foundations requiring underslab waterproofing protection, but where site conditions or budget considerations might not require an additional layer of bentonite protection. E.Protect Wall can be used in conjunction with other E.Series systems and is designed to handle a wide variety of positive side wall conditions, while providing enhanced protection against common backfill materials.

E.Protect Wall is compatible with all different types of over excavated wall construction, two-sided formed, one sided shotcrete, precast concrete, insulated concrete forms (ICF), and concrete masonry units (CMU).

BENEFITS

- Chemically Resistant. Provides chemical resistance to a wide range of contaminants commonly found in soil and groundwater.
- Seamless. Composite field-installed membranes do not contain a continuous seam.
- Fully Bonded: Fully bonds with vertical foundation wall.
- Fast Installation: Less weather sensitivity compared to comparable competitive systems.
- Designed for over excavated walls of any depth

LIMITATIONS

- A protective bentonite layer is not included in this system configuration.
- Extreme weather conditions can impact installation methodology.

SPECIFICATIONS, DRAWINGS, AND TECHNICAL ASSISTANCE

The most current specifications and drawings can be found on www.eproinc.com. For project specific details contact EPRO directly, or the local EPRO representative.

Site conditions, performance goals, and budget determine which system is more appropriate for a given project. For more information regarding product performance, testing, plan review, or general technical assistance, please contact EPRO.

WARRANTY

EPRO provides a wide range of warranty options for E.Series systems. For a project to be eligible for any warranty option beyond a 1-year material warranty, an EPRO Authorized Applicator must be used and the project must be registered and approved by EPRO prior to the commencement of any product application.

Warranty options available for this system include:

- Material warranty
- E.Series Labor and Material Warranty
- E.Assurance No-Dollar-Limit Warranty

For information relating to EPRO's E.Assurance warranty program, contact EPRO. All E.Assurance no-dollar-limit labor and material warranties are approved on a project by project basis. E.Assurance warranties are available for deck applications when E.Series systems are used on the below-grade envelope.

PROPERTIES	TEST METHOD	VALUE
Tensile Strength	ASTM D412	1027.7 psi
Elongation	ASTM D412	664%
Adhesion to Concrete	ASTM D903	20.0 lbf/in
Puncture Resistance	ASTM D1709	57.2 lbf
Hydrostatic Head Resistance	ASTM D5385	100 psi (231 ft)
Water Vapor Transmission	ASTM E96	.0374 perms



PM Sealant

Product Description

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

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

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

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

Benefits

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

Limitations

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

Technical Data

Properties: See physical properties table.

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

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

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

Shelf Life: Sausage = 12 months.

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

Installation

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

Application: Please refer to manufacturer's specifications.

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

Installation: Determine minimum bead thickness and tool into surface.

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

Availability and Packaging

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

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

Warranty

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

Equipment

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

Technical Services and Information

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

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



PM Sealant

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

Dimensions: Sausage: 20 oz (591 ml)

Weight: Sausage: 2.5 lbs (1.13 kg)



e.trowel

Product Description

Basic Use: e.trowel is a higher viscosity version of e.roll that is designed to be applied with a trowel. Used for system detailing, repairs, and to create reinforcement details. Reinforcement details use e.trowel and e.poly to reinforce system penetrations, terminations, seams, cracks, and membrane transitions. e.trowel is used on decks, over-excavated walls, blindside vertical walls, and underslab E.Series assemblies. e.trowel can be applied to a wide range of materials/substrates, high density polyethylene (HDPE), polyolefin sheets, geotextile fabric, wood, metal, foam insulation, and concrete based surfaces (green concrete, shotcrete and concrete masonry units (CMU)).

Composition: e.trowel is a high viscosity water-based, polymer-modified anionic asphalt emulsion, which exhibits exceptional bonding, elongation and waterproofing characteristics.

Benefits

- e.trowel is a single component material, no additional blending is required
- Provides the ability to easily detail and repair assemblies without the use of a spray pump
- Non-toxic, non-hazardous, non-flammable, and VOC free
- Forms both a mechanical and ionic bond directly to concrete
- Application to damp substrates is acceptable

Limitations

- Surfaces shall be free of dirt and debris
- Material should be stored above 40°F and not allowed to freeze
- Not a traffic bearing surface, additional protection required
- Must not be applied to ponded water
- Cold temperatures will prolong cure time

Technical Data

Shelf life: 6 months. The ability to apply the product beyond its estimated shelf life is dependent on storage conditions and homogeneity of the product. Storing material in an enclosed temperature controlled environment that maintains a minimum ambient temperature of 65° Fahrenheit will likely extend the shelf life beyond 6 months.

Properties: See physical properties table

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

Installation

Surface Preparation: All surfaces shall be prepared in accordance to manufacturer's specifications. In general, this means all surfaces shall be uniform, free of loose materials, and surface contaminants. Contaminant and loose debris shall be removed prior to application by suitable methods. A test should always be done prior to application using the same cleaning preparation and application procedures to be used on the project.

Application: Please refer to manufacturer's specifications. e.trowel shall be spray applied to the specified nominal mil thickness. e.trowel may be applied by stainless steel trowel.

Availability and Packaging

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

e.trowel is available in 5 gallon or 1 gallon containers.

Warranty

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

Equipment

No special equipment is necessary.

Technical Services and Information

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

This product was formally known as Ecoline-T.



e.trowel

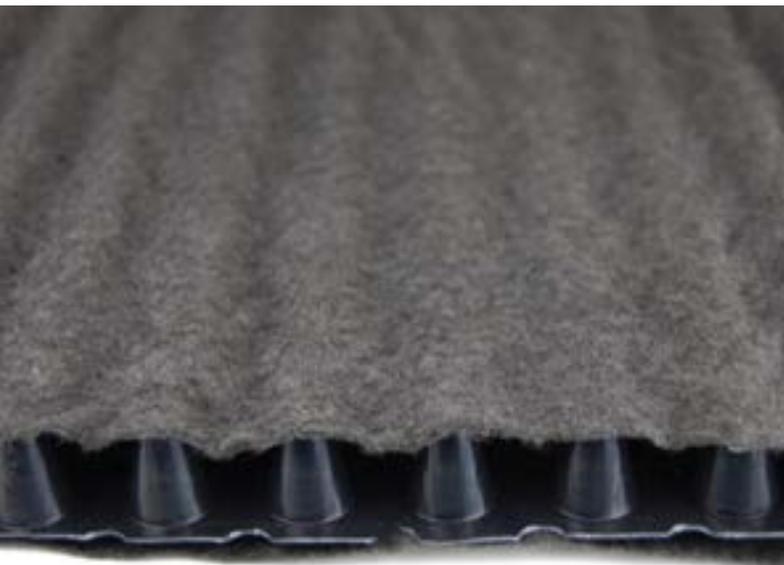
Typical Physical Properties

Physical Property	Test Method	Value
Color		Brown to Black
Solvent Content.....		No Solvents
Shelf Life.....		1 year
Tensile Strength	ASTM 412	319 psi
Elongation	ASTM 412	300%
Moisture Vapor Transmission.....	ASTM E 96	0.01 g/sq. ft./hr.
Hydrostatic Water Pressure.....	ASTM D 751.....	28 psi
Perm Rating.....	ASTM E 96 (US Perms).....	0.17
Adhesion to Concrete & Masonry	ASTM C 836.....	1 lbf/inch
Crack Bridging.....	ASTM C 836.....	No Cracking
Low Temp. Flexibility.....	ASTM C 836-00.....	No Cracking at -20°C

Packaging: 5 gallon or 1 gallon bucket



e.drain 12ds



Product Description

Basic Use: e.drain 12ds has been specifically designed for installation at the base of below grade foundation walls to enhance the removal of water away from the building to the specified discharge points.

Composition: e.drain 12ds features a lightweight three-dimensional, highly flexible polypropylene core and a non-woven geotextile filter fabric. The filter fabric is bonded to the dimples of the polypropylene core to prevent clogging within the drain.

Benefits

- Cost effective alternative to traditional pipe and gravel French drains
- Exceptional flow rates
- Excellent compressive strength
- Installation can occur in any weather condition

Limitations

- Not effective when constantly submerged

Technical Data

Properties: See physical properties table

Coverages: One roll covers 165 lineal feet

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

Installation

Preparation: Please refer to manufacturer's specifications for substrate requirements. Rolls should be inspected for cosmetic damage prior to application. Substrate must be inspected prior to application to make certain it is in accordance with manufacturer's requirements.

Application: Please refer to manufacturer's specifications. Installation of e.drain 12ds shall occur prior to the placement of any additional drainage composite. e.endout, e.sideout, e.splice, and e.corner fittings shall be used in transition with e.drain as required.

Availability and Packaging

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

Roll: 165'x 12" x 1", 65 lbs.

Warranty

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

Equipment

No special equipment is required.

Technical Services and Information

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

This product was formally known as Ecodrain-DS 12.



e.drain 12ds

Typical Physical Properties

Physical Property	Test Method	Value
Dimpled Core		
Core Material		Polypropylene
Color		Black
Compressive strength	ASTM D1621	9,500 PSF (455 kN/m ²)
Thickness	ASTM D1777	1"
Flow rate.....	ASTM D4716.....	30 gpm/ft of width
Filter Fabric		
CBR puncture	ASTM D6241	250 lbs.
Grab tensile strength.....	ASTM D4632	100 lbs
AOS	ASTM D4751	70 U.S. sieve
Permitivity	ASTM D4491	2.0 sec ⁻¹
Flow rate.....	ASTM D4491	140 gpm/ft ²
UV resistance	ASTM D4355	70% (500 hrs)

Dimensions: 165' x 12" x 1"

Weight: 65 pounds



e.stop hpl



Product Description

Basic Use: e.stop hpl is designed to self seal joints or penetrations in concrete when exposed to moisture, and specified when a bentonite based waterstop is not effective due to contamination, or high salinity.

Composition: e.stop 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 in tidal areas (hydration/dehydration)
- Ideal for groundwater conditions that limit the effectiveness of bentonite based products

Limitations

- Not a self-adhering product and requires the use of e.stop primer prior to securing waterstop to concrete, metal, or PVC (Pipe) surfaces
- Not designed, nor intended to function as an expansion joint sealant
- Not resistant to pre-hydration, store in dry area.

Technical Data

Properties: See physical properties table

Coverages: 16.8' linear feet

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

Installation

Preparation: Surfaces should be clean and dry. Remove all dirt, rocks, rust or other construction debris. Do not install e.stop hpl in standing water or on an iced substrate. Apply a continuous layer of e.stop primer along the substrate where e.stop hpl will be installed. Assure proper 3" (75 mm) concrete coverage will be maintained.

Installation: Firmly press the entire length of e.stop hpl onto the adhesive. For best results apply e.stop hpl within 30 minutes of adhesive installation. e.stop primer may be applied to damp surfaces, but not in standing water.

At structural and pipe penetrations, cut into strips to fit around the penetration. Apply to adhesive and abut coil ends together. On irregular surfaces such as stone or rough concrete, make sure waterstop remains in direct contact with the substrate along the entire installation. There should not be any air gap between the waterstop and the substrate

Availability and Packaging

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

Roll: 16.8' x 3/4" x 1" x per roll, six rolls per case

Warranty

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

Equipment

No special equipment is needed.

Technical Services and Information

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

This product was formally known as Eprostop-HPL.



e.stop hpl

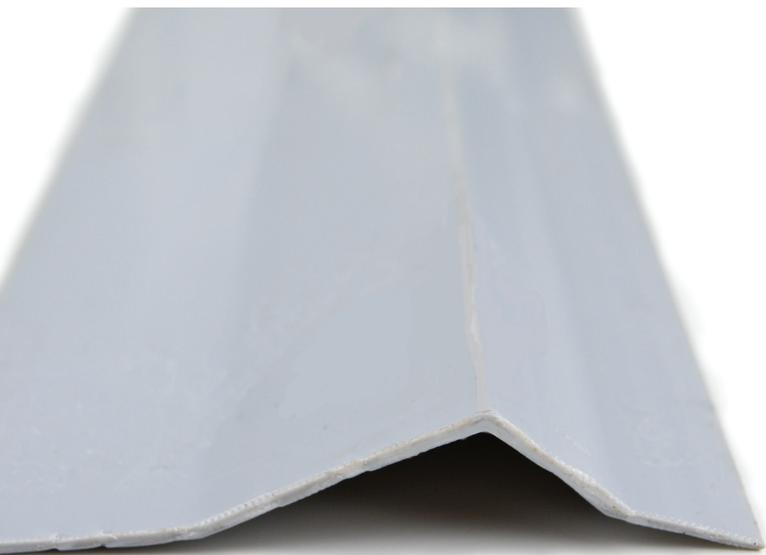
Typical Physical Properties

Physical Property	Test Method	Value
Specific Gravity.....	ASTM D71	1.35+5
Hydrocarbon Content	ASTM D4.....	47% min.
Volatile Matter.....	ASTM D6.....	1% max.
Penetration, cone 77°F, 150 gm 5 sec.....	ASTM D217.....	40+5

Dimensions: 16.8' x 3/4" x 1"



e.term hd



Product Description

Basic Use: e.term hd is made from flexible, high strength PVC. It provides an excellent solution for top terminations with below-grade waterproofing membranes and drainage boards systems. e.term hd protects the waterproofing top edge and will secure drain panels and protection boards.

Composition: High strength PVC.

Benefits

- Unique design prevents penetration of the membrane system
- Performs as a termination bar and flashing
- Flashing prevents debris from getting behind the prefabricated drainage composite

Limitations

- A sealant bead is required on the top edge of the termination bar

Technical Data

Properties: See physical properties table

Coverages: 8 lineal feet

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

Installation

Surface Preparation: All surfaces shall be prepared in accordance to manufacturer's specifications. Substrate shall be smooth and uniform to allow for consistent fastening and then e.term hd termination bar is achieved.

Application: Install e.term hd at the top edge of material or through waterproofing membrane using 1-1/4" galvanized shot pins and counter flash with drain board. Attach every 1 ft. on center with appropriate mechanical or power actuated fasteners.

Availability and Packaging

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

Bar: 8 feet in length and available individually or in bundles of 50

Warranty

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

Equipment

Secure 1-1/4" shot pins using power-actuated fastener or by hand.

Technical Services and Information

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

This product was formally known as Term Bar HD.



e.stop gu

Product Description

Basic Use: e.stop gu is a self-adhering gunnable expanding waterstop paste designed to stop water infiltration through cast-in-place concrete at construction joints and penetrations. It expands upon contact with water to form a positive seal against the concrete. The key to e.stop gu's effectiveness is that it is highly expansive, which seals and fills voids in cracks and concrete, and is easy to apply using caulking equipment.

e.stop gu can be applied over rough and smooth concrete, steel piles, dowels and Nelson Studs, and on iron or PVC pipes.

For shotcrete applications, e.stop gu requires a double layer application with a minimum 1-inch separation.

Composition: e.stop gu is a gray hydrophilic expanding urethane waterstop sealant.

Benefits

- Active swelling waterstop is fully encased in concrete to seal off water ingress.
- Self-adhering over concrete, iron, steel, and PVC.
- Fast and easy installation.
- Conforms to irregular surfaces.
- Seals around pipe penetrations.
- Ideal when pouring against existing concrete.
- High resistance to hydrostatic pressure.

Limitations

- Not an expansion joint sealant.
- It is designed for structural concrete with a minimum of 2,600 psi compressive strength.
- Requires a minimum of 3-inch (75 mm) of concrete coverage depending on the size of the bead used.
- Must be fully cured before concrete pour.
- Not resistant to pre-hydration.

Technical Data

Properties: See physical properties table.

Coverages: Coverage is dependent on the size of application bead. Applied material skins over after two hours and moisture cures in ten hours.

Minimum bead size and estimated linear coverage:

- 1/2" x 1/2": 6'-6" (2 m)
- 3/8" x 3/4": 5'-11" (1.8 m)

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

Shelf Life: 12 months.

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

Installation

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

Application: Please refer to manufacturer's specifications.
Substrate Preparation: Wipe substrates to receive e.stop gu clean to remove any dirt, dust, or moisture. Clean the surface of penetrations or protrusions with a wire brush to remove dirt, dust, rust, and loose particles. Surface must be free of frost or ice. No priming is necessary.

Installation: e.stop gu is used as a waterstop for penetrations, piles, dowels, and all concrete construction joints.

Availability and Packaging

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

Tube Size: 10.8 oz (320 ml), 0.68 lbs (0.31 kg)

Case Size: 24 tubes, 16.2 lbs (7.35 kg)

Warranty

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

Equipment

Caulking gun (10.8 oz. tube capacity).

Technical Services and Information

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

This product was formally known as SepaSeal SH-100 by Kingfield Construction Products.

Physical Properties	
Hydrostatic Head Resistance	
1/2 x 1/2	100 feet (43 psi / 30.5 m)
3/8 x 3/4	150 feet (65 psi / 46 m)



e.spray



Product Description

Basic Use: e.spray is a key component to EPRO's redundant field installed composite design concept. e.spray is a polymer modified asphalt (PMA) applied to nominal dry thicknesses of 60, 80, and 100 mils depending on the E.Series system configuration. For robust horizontal deck applications, a 120 mil reinforced option should be specified. Spray applied to form a seamless barrier, e.spray is an integral component to all E.Series systems due to its ability to further enhance and bond to a variety of materials; these materials include, high density polyethylene (HDPE), polyolefin sheets, geotextile fabric, wood, metal, foam insulation, and concrete based surfaces (green concrete, shotcrete and concrete masonry units (CMU)). e.spray is applied with a proprietary self-contained sprayer designed to produce high build, monolithic, and rapidly curing membranes.

Composition: e.spray is a non-hazardous, low-viscosity, water-based, anionic asphalt emulsion modified with a blend of synthetic polymerized rubbers and proprietary additives. e.spray is highly stable during transit and proper storage, but becomes highly reactive during the spray application to form a rapidly cured membrane with exceptional bonding, elongation, and hydrophobic characteristics.

Benefits

- Provides a layer of seamless protection and redundancy in all E.Series system assemblies
- Hydrophobic and resistant to methane gas
- Non-toxic, non-hazardous, non-flammable, and VOC free
- Forms a tenacious bond directly to concrete
- Application to damp substrates is acceptable
- Can be applied in below freezing temperatures with proper equipment

Limitations

- Surfaces shall be free of dirt and debris
- Material should be stored above 40°F and not allowed to freeze
- Not a traffic bearing surface, additional protection required
- Must not be applied to ponded water
- Direct foot traffic should be limited when ambient air temperatures are greater than 100°F
- Green concrete may require a primer coat prior to application

Technical Data

Shelf life: 6 months. The ability to apply the product beyond its estimated shelf life is dependent on storage conditions and homogeneity of the product. Storing material in an enclosed temperature controlled environment that maintains a minimum ambient temperature of 65° Fahrenheit will likely extend the shelf life beyond 6 months.

Properties: See physical properties table

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

Additional test information available upon request.

Installation

EPRO Authorized Applicators must be approved in writing by EPRO prior to receiving a contract in order to qualify for a warranty for this product and system assembly.

Surface Preparation: All surfaces shall be prepared in accordance to manufacturer's specifications. Surfaces shall be uniform, free of loose materials, and surface contaminants. Contaminant and loose debris shall be removed prior to application by suitable methods.

Application: Please refer to manufacturer's specifications. e.spray shall be spray applied to the specified nominal mil thickness. When properly applied, e.spray will set up immediately on the surface and promptly start the curing process. Light foot traffic is acceptable, but must be limited to the authorized EPRO applicator. The initial cure is complete when e.spray is no longer ejecting moisture, 12 to 48 hours depending on ambient air conditions.

Availability and Packaging

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

e.spray is available in the following packaging options:

55 gallon drum
275 gallon tote
330 gallon tote



e.spray

Warranty

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

Equipment

Spray System: AD-55 Sprayer is available through EPRO. To discuss alternative spray machine options, please contact EPRO directly.

Smoke Testing: EPRO Smoke Test Machine for underslab applications

Technical Services and Information

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

This product was formally known as Ecoline-S.

Typical Physical Properties

Physical Property	Test Method	Value
Color		Brown to Black
Solvent Content.....		No Solvents
Shelf Life.....		6 months
Tensile Strength	ASTM 412	32 psi
Elongation	ASTM 412	4140%
Resistance to Decay.....	ASTM E 154 Section 13.....	4% Perm Loss
Accelerated Aging	ASTM G 23	No Effect
Moisture Vapor Transmission.....	ASTM E 96	0.026 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 & C 704.....	11 lbf./inch
Adhesion to HDPE	ASTM C 836.....	28.363 lbf./inch
Adhesion to Polypropylene Fabric.....	ASTM C 836	31.19 lbf./inch
Hardness	ASTM C 836.....	80
Crack Bridging.....	ASTM C 836-00.....	No Cracking
Low Temp. Flexibility.....		No Cracking at -20° C

Packaging: 55 gallon drum, 275 gallon tote, 330 gallon tote



e.poly



Product Description

Basic Use: e.poly is a polyester fabric that is designed to reinforce membrane terminations, transitions, penetrations, seams, and general repair areas. Used in every E.Series assembly, e.poly is installed between two layers of e.roll or e.spray.

Composition: e.poly is a 100% polyester textile material composed of staple fibers hydraulically entangled.

Benefits

- Excellent conformability and elongation
- Exceptional tear resistance and high tensile strength
- Open weave allows complete saturation and integration

Limitations

- Not suitable for expansion joints or areas where movement is desired

Technical Data

Properties: See physical properties table

Coverages: 6", 12" and 40" rolls cover 150, 300, and 1,080 square feet, respectively

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

Installation

Preparation: Please refer to manufacturer's specifications for substrate requirements. Application of e.poly should be done when weather conditions meet the requirement of e.roll or e.spray.

Installation: Please refer to manufacturer's specifications. Install specified thickness of e.roll or e.spray and immediately embed e.poly into the initial layer of e.roll or e.spray. Once firmly pressed into the uncured membrane, fully saturate with additional layer of e.roll or e.spray to the specified thickness.

Availability and Packaging

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

Roll: 6" x 300', 12" x 300', and 40" x 324' rolls are available

Warranty

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

Equipment

No special equipment is needed.

Technical Services and Information

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

This product was formally known as Polyester.



e.poly

Typical Physical Properties

Physical Property	Test Method	Value
Weight.....		3 oz.
Bursting Strength	ASTM D3786.....	177 lbs.
Tensile Strength	ASTM D1682.....	57.1 psi
Tear Strength.....	ASTM D1117.....	16.1 lbs
Elongation	ASTM D1682.....	62.0%
Conformability		Excellent
Ease of saturation		Excellent

Dimensions: 6" x 300', 12" x 300', and 40" x 324' rolls are available





e.roll



Product Description

Basic Use: e.roll is a key component to EPRO's redundant field installed composite design concept and is a roller applied version of e.spray. It is designed to be used for system detailing, repairs, and in areas where the required clearance for e.spray cannot be achieved. e.roll is most commonly used in conjunction with e.poly to reinforce system penetrations, terminations, seams, cracks, and membrane transitions. e.roll is used on decks, over-excavated walls, blindside vertical walls, and underslab E.Series assemblies. e.roll can be applied to a wide range of materials/substrates, high density polyethylene (HDPE), polyolefin sheets, geotextile fabric, wood, metal, foam insulation, and concrete based surfaces (green concrete, shotcrete and concrete masonry units (CMU)).

Composition: e.roll is a medium viscosity water-based, polymer-modified anionic asphalt emulsion, which exhibits exceptional bonding, elongation and waterproofing characteristics.

Benefits

- e.roll is a single component material, no additional blending is required
- Provides the ability to easily detail and repair assemblies without the use of a spray pump
- Non-toxic, non-hazardous, non-flammable, and VOC free
- Forms both a mechanical and ionic bond directly to concrete
- Application to damp substrates is acceptable

Limitations

- Surfaces shall be free of dirt and debris
- Material should be stored above 40°F and not allowed to freeze

- Not a traffic bearing surface, additional protection required
- Must not be applied to ponded water
- Cold temperatures will prolong cure time

Technical Data

Shelf life: 1 year. The ability to apply the product beyond its estimated shelf life is dependent on storage conditions and homogeneity of the product. Storing material in an enclosed temperature controlled environment that maintains a minimum ambient temperature of 65° Fahrenheit will likely extend the shelf life beyond 1 year.

Properties: See physical properties table

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

Installation

Surface Preparation: All surfaces shall be prepared in accordance to manufacturer's specifications. In general, this means all surfaces shall be uniform, free of loose materials, and surface contaminants. Contaminant and loose debris shall be removed prior to application by suitable methods. A test should always be done prior to application using the same cleaning preparation and application procedures to be used on the project.

Application: Please refer to manufacturer's specifications. e.roll shall be spray applied to the specified nominal mil thickness. e.roll may be applied by roller or brush.

Cleaning: Clean all tools, hoses, spray guns, and tips with kerosene and/or equivalent.

Availability and Packaging

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

e.roll is available in 5 gallon or 1 gallon containers.

Warranty

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



e.roll

Equipment

No special equipment is necessary.

Technical Services and Information

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

This product was formally known as Ecoline-R.

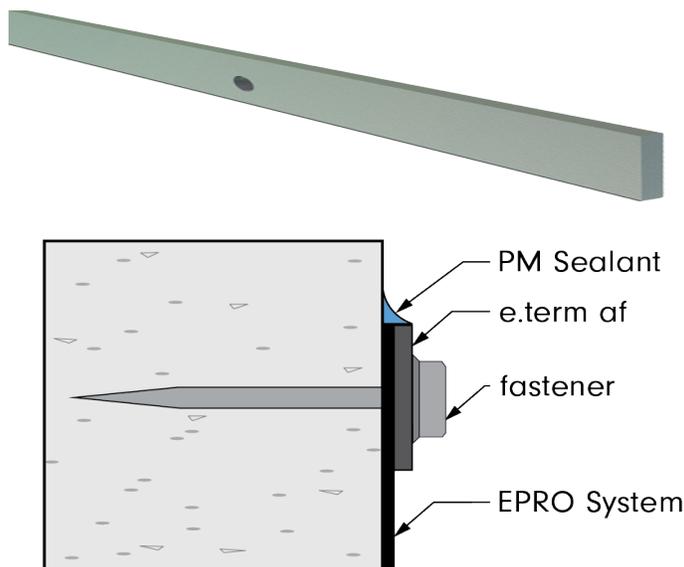
Typical Physical Properties

Physical Property	Test Method	Value
Color		Brown to Black
Solvent Content.....		No Solvents
Shelf Life.....		1 year
Tensile Strength	ASTM 412	32 psi
Elongation	ASTM 412	3860%
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.....	ASTM E 96 (US Perms).....	0.17
Methane Transmission Rate	ASTM D 14334	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

Packaging: 5 gallon bucket



e.term af



Product Description

Basic Use: e.term af is a 90 mil (2.3 mm) thick flat termination bar made from 6063-T6 extruded aluminum with 1/4" x 3/8" slotted holes 6-inches (150 mm) on-center. It provides an excellent solution for top terminations with below-grade waterproofing membranes and vapor barrier systems. e.term af protects the waterproofing top edge and will secure drain panels and protection boards.

Composition: 90 mil (2.3 mm) thick, 1-inch wide, extruded 6063-T6 aluminum.

Benefits

- Performs as a termination bar.
- Unique design prevents delamination of the waterproofing or vapor barrier membrane system.
- Prevents top edge damage of the covered membrane.

Limitations

- A sealant bead or reinforcement detail is required on the top edge of the termination bar

Technical Data

Coverage: Bar: 10 linear feet (3.1 meters)
Tube: 50 bars, 500 linear feet (152.4 meters)

Storage and Handling: Store raised off the floor away from moisture.

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

Installation

Surface Preparation: All surfaces shall be prepared in accordance to manufacturer's specifications. Substrate shall be smooth and uniform to allow for consistent fastening.

Application: Install e.term af at the top edge of material or through waterproofing membrane and fasten every 12-inches (300 mm) on-center with appropriate mechanical or power actuated fasteners using 1.25" (32 mm) galvanized shot pins or nylon-mushroom cap galvanized nails. Seal top edge of term bar and 1/8" (3 mm) beyond fastener head with PM Sealant or e.roll reinforcement detail.

Warranty

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

Availability and Packaging

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

Bar Size: 0.09" x 1" x 10' (2.3 mm x 25 mm x 3.1 m), 1.1 lbs (0.5 kg)
Tube Size: 50 strips, 500 linear feet (152.4 m), 55 lbs (24.9 kg)

Equipment

- Fasteners:** Galvanized or Stainless-Steel (min. 1.25" | 32 mm)
- Shot pins (mechanical or powder-actuated fastening)
 - Nylon-mushroom cap nails (drilled manual fastening)

Sealant:

- PM Sealant - STPE sausage-packaged sealant.
- e.roll - Single-component polymer-modified anionic asphalt emulsion.
- e.poly - Polyester reinforcing fabric.

Technical Services and Information

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



e.tape

Product Description

Basic Use: e.tape is designed to act as a seam splice when used to seam e.shield geomembrane.

Composition: e.tape is a 7.0 mil polyethylene backed, synthetic rubber adhesive coated heavy-duty adhesive tape.

Benefits

- Permanently tacky adhesive bonds well to most surfaces over a wide temperature range.
- Excellent low-temperature bonding.
- Conforms well to irregular surfaces
- Maintains a watertight seal in all weather conditions
- Good tear characteristics.

Limitations

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

Technical Data

Properties: See physical properties table.

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

Installation

Application: Please refer to manufacturer's specifications.

Availability and Packaging

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

Technical Services and Information

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

Typical Physical Properties

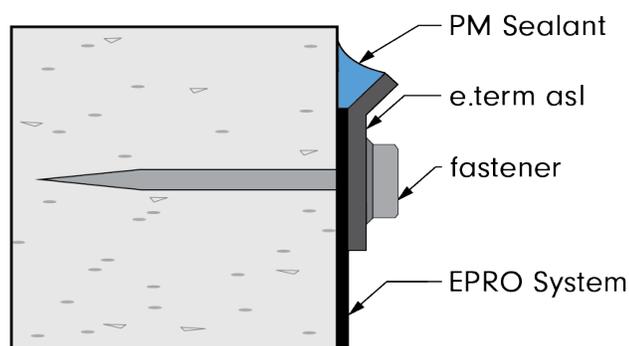
Physical Property	Value
Adhesive Thickness	2.5 mils
Total Thickness	7.0 mils
Backing Adhesion	35 oz./in.
Elongation	80%
Peel Adhesion to Stainless Steel	60 oz./in.
Tensile Strength (ASTM D1000)	18 lbs./in.

Warranty

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e.term asl



Product Description

Basic Use: e.term asl is a 75 mil (1.9 mm) thick termination bar with an angled sealant ledge made from 6063-T6 extruded aluminum with 1/4" x 3/8" slotted holes 6-inches (150 mm) on-center. It provides an excellent solution for top terminations with below-grade waterproofing membranes and vapor barrier systems. e.term asl protects the waterproofing top edge and will secure drain panels and protection boards.

Composition: 75 mil (1.9 mm) thick, 1-inch wide, extruded 6063-T6 aluminum.

Benefits

- Performs as a termination bar.
- Unique design prevents delamination of the waterproofing or vapor barrier membrane system.
- Angled sealant edge secures sealant at termination edge.
- Prevents top edge damage of the covered membrane.

Limitations

- A sealant bead or reinforcement detail is required on the top edge of the termination bar

Technical Data

Coverage: Bar: 10 linear feet (3.1 meters)
Tube: 50 bars, 500 linear feet (152.4 meters)

Storage and Handling: Store raised off the floor away from moisture.

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

Installation

Surface Preparation: All surfaces shall be prepared in accordance to manufacturer's specifications. Substrate shall be smooth and uniform to allow for consistent fastening.

Application: Install e.term asl at the top edge of material or through waterproofing membrane with the angled sealant ledge facing up and fasten every 12-inches (300 mm) on-center with appropriate mechanical or power actuated fasteners using 1.25" (32 mm) galvanized shot pins or nylon-mushroom cap galvanized nails. Seal top edge of term bar and 1/8" (3 mm) beyond fastener head with PM Sealant or e.roll reinforcement detail.

Warranty

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

Availability and Packaging

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

Bar Size: 0.075" x 1" x 10' (1.9 mm x 25 mm x 3.1 m), 1.0 lbs (0.45 kg)
Tube Size: 50 strips, 500 linear feet (152.4 m), 50 lbs (22.7 kg)

Equipment

Fasteners: Galvanized or Stainless-Steel (min. 1.25" | 32 mm)

- Shot pins (mechanical or powder-actuated fastening)
- Nylon-mushroom cap nails (drilled manual fastening)

Sealant:

- PM Sealant - STPE sausage-packaged sealant.
- e.roll - Single-component polymer-modified anionic asphalt emulsion.
- e.poly - Polyester reinforcing fabric.

Technical Services and Information

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



e.stop



Product Description

Basic Use: e.stop b is an expanding strip waterstop designed to stop water infiltration through cast-in-place concrete construction joints. It expands upon contact with water to form a positive seal against the concrete. The key to e.stop b's effectiveness is that it is highly expansive, which seals and fills voids in cracks and concrete.

Composition: e.stop b is a moisture activated high sodium bentonite content based waterstop.

Benefits

- Active swelling waterstop is fully encased in concrete to seal off water ingress
- Fast and easy installation
- Seals around pipe penetrations
- Ideal when pouring against existing concrete
- High resistance to hydrostatic pressure

Limitations

- Not a self-adhering product and requires the use of e.stop primer prior to securing waterstop to concrete, metal, or PVC (Pipe) surfaces
- Not designed, nor intended to function as an expansion joint sealant
- It is designed for structural concrete with a minimum of 3,000 psi compressive strength. e.stop b requires a minimum of 3" (75 mm) of concrete coverage.
- Not resistant to pre-hydration

Technical Data

Properties: See physical properties table

Coverages: 16.67" linear feet

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

Installation

Preparation: Surfaces should be clean and dry. Remove all dirt, rocks, rust or other construction debris. Do not install e.stop b in standing water or on an iced substrate. Apply a continuous layer of e.stop primer along the substrate where e.stop b will be installed. Assure proper 3" (75 mm) concrete coverage will be maintained.

Installation: Firmly press the entire length of e.stop b onto the adhesive. For best results apply e.stop b within 30 minutes of adhesive installation. e.stop primer may be applied to damp surfaces, but not in standing water.

At structural and pipe penetrations, cut into strips to fit around the penetration. Apply to adhesive and abut coil ends together. On irregular surfaces such as stone or rough concrete, make sure waterstop remains in direct contact with the substrate along the entire installation. There should not be any air gap between the waterstop and the substrate

Availability and Packaging

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

Roll: 16.67' x 3/4" x 1" x per roll, six rolls per case

Warranty

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

Equipment

No special equipment is needed.

Technical Services and Information

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

This product was formally known as Eprostop-BP.



e.stop

Typical Physical Properties

Physical Property	Test Method	Value
Hydrostatic Head	Independent	231 ft
Wet/Dry Cycling (25 cycles)	Independent	No Effect
Adhesion to Concrete	Independent	Excellent

Dimensions: 16.67' x 3/4" x 1"





e.drain 6000



Product Description

Basic Use: e.drain 6000 is applied in negative side applications to blindside shoring walls, in positive side applications to over excavated walls, and over plaza decks. e.drain 6000 prefabricated drainage composite is designed to protect the E.Series system assembly, while effectively eliminating the buildup and ponding of water against the membrane assembly.

Composition: e.drain 6000 features a lightweight three-dimensional, high-compressive strength polypropylene core and bonded non-woven geotextile fabric. The bonded filter fabric allows water to pass freely into the molded drain while preventing soil particles from entering and clogging the core structure.

Benefits

- Provides extremely high compressive strength to meet a wide variety of project conditions
- Polypropylene provides greater chemical resistance than traditional polystyrene
- Maintains flexibility in freezing temperatures

Limitations

- Long-term UV exposure is not recommended

Technical Data

Properties: See physical properties table

Coverages: 6' x 50' roll covers 300 square feet; 8' x 50' roll covers 400 square feet, not including overlaps or waste

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

Installation

Preparation: Please refer to manufacturer's specifications for substrate requirements. Rolls should be inspected for cosmetic damage prior to application. Substrate must be inspected prior to application to make certain it is in accordance with manufacturer's requirements.

Application: Please refer to manufacturer's specifications. Drainage panels may run horizontally or vertically. In blindside shoring applications, secure e.drain to shoring using 2-inch flat washer fasteners every 24 inches on center on seams and terminations and a minimum of every 48 inches on center in the field.

Availability and Packaging

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

Roll: 6' x 50', 8' X 50'

Weight: 6' rolls = 64 lbs, 8' rolls = 81 lbs

Warranty

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

Equipment

Secure with shot pins using power-actuated fastener or by hand.

Technical Services and Information

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

This product was formally known as Ecodrain-S6000.



e.drain 6000

Typical Physical Properties

Physical Property	Test Method	Value
Dimpled Core		
Core Material		Polypropylene
Color		Black
Dimple Height.....	ASTM D1777	0.4" (10.16 mm)
Compressive Strength	ASTM D1621	16,500 psf (790 kN/m ²)
Flow rate.....	ASTM D4716.....	21 gal/min/ft
Filter Fabric		
Grab Tensile.....	ASTM D4632	100 lbs
CBR Puncture Resistance.....	ASTM D6241	250 lbs
Apparent Operating Size	ASTM D4751	70 US Sieve (.0212mm)
Water Flow Rate	ASTM D4491	140 gpm/ft ² (5704 l/min/m ²)
UV Resistance	ASTM D4355.....	70% (500 hrs)

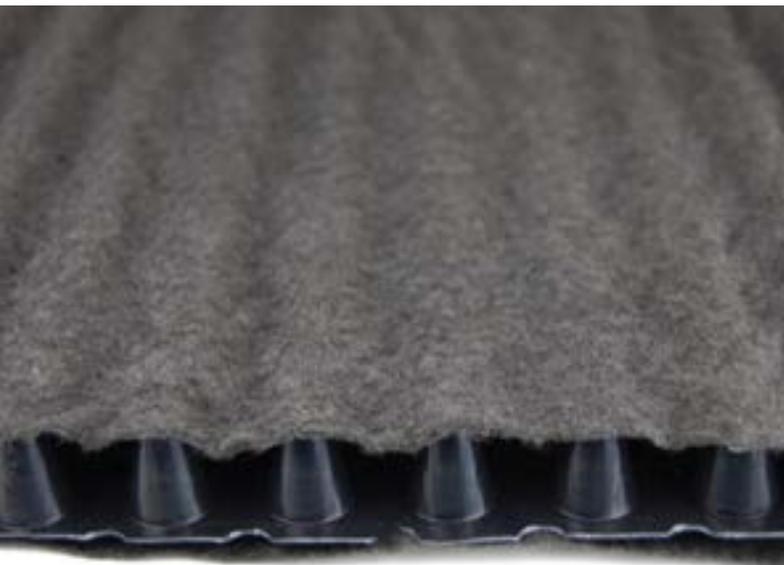
Dimensions: 6' x 50', 8' X 50'

Weight: 6' rolls = 64 lbs, 8' rolls = 81 lbs





e.drain 12ds



Product Description

Basic Use: e.drain 12ds has been specifically designed for installation at the base of below grade foundation walls to enhance the removal of water away from the building to the specified discharge points.

Composition: e.drain 12ds features a lightweight three-dimensional, highly flexible polypropylene core and a non-woven geotextile filter fabric. The filter fabric is bonded to the dimples of the polypropylene core to prevent clogging within the drain.

Benefits

- Cost effective alternative to traditional pipe and gravel French drains
- Exceptional flow rates
- Excellent compressive strength
- Installation can occur in any weather condition

Limitations

- Not effective when constantly submerged

Technical Data

Properties: See physical properties table

Coverages: One roll covers 165 lineal feet

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

Installation

Preparation: Please refer to manufacturer's specifications for substrate requirements. Rolls should be inspected for cosmetic damage prior to application. Substrate must be inspected prior to application to make certain it is in accordance with manufacturer's requirements.

Application: Please refer to manufacturer's specifications. Installation of e.drain 12ds shall occur prior to the placement of any additional drainage composite. e.endout, e.sideout, e.splice, and e.corner fittings shall be used in transition with e.drain as required.

Availability and Packaging

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

Roll: 165'x 12" x 1", 65 lbs.

Warranty

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

Equipment

No special equipment is required.

Technical Services and Information

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

This product was formally known as Ecodrain-DS 12.



e.drain 12ds

Typical Physical Properties

Physical Property	Test Method	Value
Dimpled Core		
Core Material		Polypropylene
Color		Black
Compressive strength	ASTM D1621	9,500 PSF (455 kN/m ²)
Thickness	ASTM D1777	1"
Flow rate.....	ASTM D4716.....	30 gpm/ft of width

Filter Fabric

CBR puncture	ASTM D6241	250 lbs.
Grab tensile strength.....	ASTM D4632	100 lbs
AOS	ASTM D4751	70 U.S. sieve
Permitivity	ASTM D4491	2.0 sec ⁻¹
Flow rate.....	ASTM D4491	140 gpm/ft ²
UV resistance	ASTM D4355.....	70% (500 hrs)

Dimensions: 165' x 12" x 1"
Weight: 65 pounds





e.shield 115

Product Description

Basic Uses: e.shield 115 is specifically designed to provide a robust protection course for E.Series waterproofing systems being applied to below grade over excavated walls and plaza decks. Within the redundant field installed composite design philosophy, e.shield 115 adds another layer of waterproofing protection, serves as a protection course to the previously installed e.spray layer, and acts as a slip-sheet between the e.drain drainage composite. e.shield 115 exceeds ASTM E 1745 class A, B, and C requirements.

Composition: e.shield 115 is a red 15 mil geomembrane made from a custom blend of polyolefin copolymers.

Benefits

- High puncture resistance and durability enhance system performance and redundancy
- Provides a cost effective option for budget minded projects

Limitations

- Does not contain an additional layer of bentonite
- Should not be used in lieu of high flow drainage mat

Technical Data

Properties: See physical properties table

Coverages: Roll covers 1800 square feet, not including overlaps or waste.

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

Installation

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

Application: Please refer to manufacturer's specifications. General guidelines include 6" seam overlaps with a 30 mil application of e.spray in the seam overlap.

Availability and Packaging

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

Roll Size: 12' x 150' folded rolls, 144 lbs.

Warranty

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

Equipment

Seaming: AD-55 Sprayer, available through EPRO for application of e.spray in seam overlaps, or by hand using e.roll.

Technical Services and Information

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

This product was formally known as Ecoshield-E15.



e.shield 115

Typical Physical Properties

Physical Property	Test Method	Value
Film Material.....		Polypropylene
Film Color.....		Red
Film Thickness.....		15 Mil
Classification.....	ASTM E1745	Class A, B & C
Water Vapor Permeance.....	ASTM F1249	0.0078 perms
Tensile Strength.....	ASTM D882	64 lbf/inch
Puncture Resistance.....	ASTM D1709	4000 grams
Life Expectancy.....	ASTM E154	Indefinite
Chemical Resistance.....	ASTM E154	Unaffected
Low Temp. Impact.....	ASTM D1790	Resistant to 105° C
Methane Gas Modified.....	ASTM D1434	252.55 GTR
ACI 302.1 R-96 Minimum Thickness 10-mils.....		Exceeds

Dimensions: 12' X 150'

Weight: 144 pounds



e.adhesive

Product Description

Basic Use: e.adhesive is designed as a surface adhesion promoter for wide range of substrates when a fast drying, solvent free, a tacky surface is required. Primarily used as a primer for EPRO waterstops, including e.stop b and e.stop hpl, e.adhesive is applied directly to concrete to provide a tacky substrate to secure e.stop in place prior to fastening of the waterstop.

Composition: e.adhesive is a high tack acrylic emulsion primer available in 1 gallon pails.

Benefits

- Quick drying
- Water based, environmentally friendly low VOC
- Tacky film provides strong adhesion to desired substrate
- Easily applied with brush or roller

Limitations

- Not to be applied over standing water or loose substrates
- Keep from freezing

Technical Data

Physical Properties:

Color:	White
Solids Content:	63+/- @5 by weight
Flammability:	Wet nonflammable, dry burns
Flash Point:	Greater than 212°F
Viscosity:	3,000 - 5,000 cps
VOC:	< 25 grams per liter

Coverages: 100 - 150 sq. ft. per gallon

Specification Writer: For e.stop applications, e.adhesive is required for all waterstop applications. One row of e.stop shall be used above the water table, and two rows are required for application elevations located in the design water table.

Installation

Preparation: All surfaces must be clean and free from debris, loose materials, curing agents, or any material that may interfere with the bond between e.adhesive and the substrate.

Application: Mix material before use to ensure uniformity. When applying with a brush, apply with a wide fiber brush to create a smooth uniform film. When applying with a roller, use a low nap phenolic core roller.

Drying Time: Initial set time is 30 min at 68°F

Application Temperature: 32°F - 110°F, for temperatures below freezing contact EPRO about acceptable surface conditioner.

Availability and Packaging

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

Pail: 1 gallon, 10 pounds.

Warranty

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

Equipment

Brush or phenolic core roller should be used for application.

Technical Services and Information

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

This product replaces e.stop primer.



e.catalyst

Product Description

Basic Use: e.catalyst is a premixed, food grade, highly purified concentrate solution that is used to rapidly cure e.spray polymer modified asphalt during application. The premixed solutions are designed to make catalyst creation easy by simplifying the creation of catalyst solution in the field. While calcium chloride flake can take significant time to uniformly mix and can lead to clogging at the spray tips, e.catalyst creates a consistent solution in half the time and drastically reduces spray tip clogging.

Benefits

- Food grade calcium chloride solution provides very low alkali metals, iron, and other impurities commonly found in mass produced calcium chloride flake
- Reduces clogging at spray tips
- Mix time drastically reduced

Limitations

- Keep from freezing

Technical Data

Physical Properties:

Color:	Blue
Odor:	None
Chemical :	Calcium Chloride
PH:	Slightly Alkaline
Impurities:	< 0.01% by weight

Coverages: Two, 5-gallon pails per 55 gallon drum of catalyst

Mixing and Safety

Mixing: Using a clean plastic drum, mix one 5 gallon pail of e.catalyst for every 27.5 gallons of room temperature or warmer water. Do not use any reclaimed water when mixing calcium chloride solution. Mix solution with a clean stir stick; no crystallization should be visible.

Safety: Liquid calcium chloride is a strong salt solution. Wear appropriate protective, impervious clothing. Wear safety glasses with non-flexible side shields or chemical goggles for proper protection of the eyes. Wear appropriate protective non-leather protective gloves and boots. Chemical protective gloves and boots such as PVC or Nitrile are recommended to protect hands. Leather products do not offer adequate protection and will dehydrate with resultant shrinkage and possible destruction. This product should be handled in areas with proper ventilation. Before using this product, refer to the SDS which is available on the Company's website for complete safety and handling guidelines.

Availability and Packaging

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

Pail: 5 gallon pail, bulk quantities also available

Warranty

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

Equipment

55 gallon plastic drum, clean stir stick to agitate material

Technical Services and Information

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



SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.term af, e.term asl
Product Description: aluminum term bars
Synonyms: N/A
CAS No: N/A

Supplier:
EPRO Services, Inc.
PO Box 347
Derby, KS 67037
800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

Classification of the Substance or Mixture

Classification (GHS-US): Not classified

Label Elements

GHS-US Labeling: No labeling applicable

Other Hazards: This product is physiologically inert in its massive form. However, user-generated dust and/or fumes may pose a physiological hazard if inhaled or ingested. Avoid inhalation of metal dusts and fumes. May cause an influenza-like illness. Avoid skin and eye contact with dusts to prevent mechanical irritation. User-generated dust is easily ignited and difficult to extinguish. This product contains components that are environmentally hazardous and small chips, fine turnings, and dust from processing may be toxic to aquatic life.

Unknown Acute Toxicity (GHS-US): No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances: Not applicable

Mixtures

Name	% (w/w)	Classification (GHS-US)
Aluminum CAS No 7429-90-5	>89.9	Comb. Dust; Flam. Sol 1, H228 Water-react. 2, H261
Zinc CAS No 7440-66-6	<0.1 0.1 – 1.0, 1.0 – 2.5	Aquatic Acute 1, H400 Aquatic Chronic 1, H410
Magnesium CAS No 7439-95-4	<0.1, 0.1 – 1.0 1.0 – 2.1	Flam. Sol. 1, H228; Self-heat. 2, H252 Water-react. 2, H261
Silicon CAS No 7440-21-3	<0.1, 0.1 – 1.0, 1.0 – 1.8	Comb. Dust
Manganese	<0.1,	Comb. Dust

CAS No 7439-96-5	0.1 – 1.0, 1.0 – 1.5	
Copper CAS No 7440-50-8	<0.1, 0.1 – 1.0 1.0 – 1.3	Comb. Dust Aquatic Acute 1, h400 Aquatic Chronic 3, H412
Iron CAS No 7439-86-6	<0.1, 0.1 – 1.0 1.0 – 1.1	Comb. Dust Flam. Sol. 1, H228 Self-heat. 1, H251
Chromium CAS No 7440-47-3	<0.1, 0.1 – 0.5	Comb. Dust
Lead CAS No 7439-92-1	<0.1	Acute Tox. 4 (Oral), H302; Acute Tox. 4 (Inhalation: dust, Mist), H332; Carc. 1B, H350; Repr. 1A, H360; STOT RE 1, H372; Aquatic Acute 1, H400; Aquatic Chronic 1, H410

* More than one of the ranges of concentration prescribed by Controlled Products Regulations has been used where necessary due to varying composition.

Full text of H-phrases: see section 16

4. FIRST-AID MEASURES

Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. If medical advice is needed, have product container or label at hand.

Inhalation: Remove to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.

Skin Contact: Cool skin rapidly with cold water after contact with molten product. Removal of solidified molten material from skin requires medical assistance.

Eye Contact: Removal of solidified molten material from the eyes requires medical assistance. Immediately rinse with water for a prolonged period (at least 15 minutes) while holding the eyelids wide open. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if irritation develops or persists.

Ingestion: Do not induce vomiting. Rinse mouth. Immediately call a POISON CENTER or doctor/physician.

Most Important Symptoms and Effects Both Acute and Delayed

General: Under normal conditions of use not expected to present a significant hazard. During processing or physical alteration, flakes or powder cause irritation of the respiratory tract, eyes, skin, and are harmful. Molten material may release toxic, and irritating fumes.

Inhalation: During processing, the most significant route of exposure is by the inhalation (breathing) of fumes. If fumes are inhaled, they can cause a condition commonly known as metal fume fever with symptoms which resemble influenza; Symptoms may be delayed 4-12 hours and begin with a sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms may include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude, and a generalized feeling of malaise. Fever, chills, muscular pain, mild to severe headache, nausea, occasional vomiting, exaggerated mental activity, profuse sweating, excessive urination, diarrhea, and prostration may also occur.

Skin Contact: Causes severe skin burns. Contact with fumes or metal powder will irritate skin. Contact with hot, molten metal will cause thermal burns. Dust may cause irritation in skin folds or by contact in combination with tight clothing. Mechanical damage via flying particles and chipped slag is possible.

Eye Contact: During metal processing, dusts caused from milling and physical alteration will likely cause eye irritation.

Fumes from thermal decomposition or molten material will likely be irritating to the eyes. Mechanical damage via flying particles and chipped slag is possible.

Ingestion: Ingestion is not considered a potential route of exposure.

Chronic Symptoms: Inhalation of iron oxide fumes undergoing decomposition may cause irritation and flu-like symptoms, otherwise iron oxide is not hazardous. Aluminum: Inhalation of finely divided aluminum powder may cause pulmonary fibrosis. Zinc: Prolonged exposure to high concentrations of zinc fumes may cause "zinc shakes", an involuntary twitching of the muscles.

Otherwise, zinc is non-toxic. Chromium: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals. Increased incidences of respiratory cancer have been found in chromium (VI) workers. There is an increased incidence of lung cancer in industrial workers exposed to chromium (VI) compounds. Please refer to IARC volume 23 for a more detailed discussion. Silicon: Can cause chronic bronchitis and narrowing of the airways. Manganese: Chronic exposure can cause inflammation of the lung tissue, scarring the lungs (pulmonary fibrosis). Anemia. Copper: Overexposure to fumes may cause metal fume fever (chills, muscle aches, nausea, fever, dry throat, cough, weakness, and lassitude); metallic or sweet taste; discoloration of skin and hair. Tissue damage of mucous membranes may follow chronic dust exposure. Lead: Exposure can result in lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; encephalopathy; kidney disease; hypertension.

Indication of Any Immediate Medical Attention and Special Treatment Needed: If you feel unwell, seek medical advice (show the label where possible).

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Unsuitable Extinguishing Media: Do not use water when molten material is involved, may react violently or explosively on contact with water.

Fire Hazard: Dust, chips, or ribbons can be ignited more easily, by an ignition source, by improper machining, or by spontaneous combustion if finely divided and damp.

Explosion Hazard: Product is not explosive.

Reactivity: Stable at ambient temperature and under normal conditions of use.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire. Under fire conditions, hazardous fumes will be present.

Firefighting Instructions: Do not breathe fumes from fires or vapors from decomposition.

Protection During Firefighting: Firefighters must use full bunker gear including NIOSH-approved positive-pressure self-contained breathing apparatus to protect against potential hazardous combustion and decomposition products.

Hazardous Combustion Products: Oxides of magnesium. Oxides of copper. Oxides of aluminum. Oxides of lead.

Reference to Other Sections

Refer to section 9 for flammability properties.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Do not handle until all safety precautions have been read and understood. Avoid breathing (vapors, dust, fumes).

For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Avoid creating or spreading dust.

For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection. Wear suitable protective clothing, gloves, and eye/face protection.

Emergency Procedures: Eliminate ignition sources. Evacuate unnecessary personnel, isolate, and ventilate area.

Environmental Precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

Methods and Material for Containment and Cleaning Up

For Containment: Contain and collect as any solid. Avoid generation of dust during clean-up of spills.

Methods for Cleaning Up: Use clean non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal.

Reference to Other Sections: See Heading 8. Exposure controls and personal protection.

7. HANDLING AND STORAGE**Precautions for Safe Handling**

Additional Hazards When Processed: Do not allow water (or moist air) contact with this material. Product dust is combustible. Use care during processing to minimize generation of dust.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and when leaving work. Do not eat, drink, or smoke when using this product. Wash hands and forearms thoroughly after handling. Always wash your hands immediately after handling this product, and once again before leaving the workplace.

Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Comply with applicable regulations.

Storage Conditions: Store in original container. Store in dry protected location to prevent any moisture contact. Keep away from heat and flame.

Incompatible Materials: Strong acids. Strong bases. Strong oxidizers. Water, humidity. Alkalis. Corrosive substances in contact with metals may produce flammable hydrogen gas.

Special Rules on Packaging: Store in a closed container.

Specific End Use(s): Various extruded aluminum parts and products and cast billet.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Control Parameters**

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government.

Aluminum (7429-90-5)		
Mexico	OEL TWA (mg/m ³)	10 mg/m ³ (dust)
USA ACGIH	ACGIH TWA (mg/m ³)	1 mg/m ³ (respirable fraction)
USA OSHA	OSHA PEL (TWA) (mg/m ³)	15 mg/m ³ (total dust) 5 mg/m ³ (respirable fraction)
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	10 mg/m ³ (total dust) 5 mg/m ³ (respirable dust)
Alberta	OEL TWA (mg/m ³)	10 mg/m ³ (dust)
British Columbia	OEL TWA (mg/m ³)	1.0 mg/m ³ (respirable)
Manitoba	OEL TWA (mg/m ³)	1 mg/m ³ (respirable fraction)
New Brunswick	OEL TWA (mg/m ³)	10 mg/m ³ (metal dust)
Newfoundland & Labrador	OEL TWA (mg/m ³)	1 mg/m ³ (respirable fraction)
Nova Scotia	OEL TWA (mg/m ³)	1 mg/m ³ (respirable fraction)

Nunavut	OEL STEL (mg/m ³)	20 mg/m ³
Nunavut	OEL TWA (mg/m ³)	10 mg/m ³
Northwest Territories	OEL STEL (mg/m ³)	20 mg/m ³
Northwest Territories	OEL TWA (mg/m ³)	10 mg/m ³
Ontario	OEL TWA (mg/m ³)	1 mg/m ³ (respirable)
Prince Edward Island	OEL TWA (mg/m ³)	1 mg/m ³ (respirable fraction)
Québec	VEMP (mg/m ³)	10 mg/m ³
Saskatchewan	OEL STEL (mg/m ³)	20 mg/m ³ (dust)
Saskatchewan	OEL TWA (mg/m ³)	10 mg/m ³ (dust)
Silicon (7440-21-3)		
Mexico	OEL TWA (mg/m ³)	10 mg/m ³ (inhalable fraction)
Mexico	OEL STEL (mg/m ³)	20 mg/m ³
USA OSHA	OSHA PEL (TWA) (mg/m ³)	15 mg/m ³ (total dust) 5 mg/m ³ (respirable fraction)
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	10 mg/m ³ (total dust) 5 mg/m ³ (respirable dust)
British Columbia	OEL TWA (mg/m ³)	10 mg/m ³ (total dust)
New Brunswick	OEL TWA (mg/m ³)	10 mg/m ³
Nunavut	OEL TWA (mg/m ³)	5 mg/m ³ (respirable mass)
Northwest Territories	OEL TWA (mg/m ³)	5 mg/m ³ (respirable mass)
Ontario	OEL TWA (mg/m ³)	10 mg/m ³ (total dust)
Québec	VEMP (mg/m ³)	10 mg/m ³ (containing no Asbestos and <1% Crystalline silica-total dust)
Saskatchewan	OEL STEL (mg/m ³)	20 mg/m ³
Saskatchewan	OEL TWA (mg/m ³)	10 mg/m ³
Yukon	OEL STEL (mg/m ³)	20 mg/m ³
Yukon	OEL TWA (mg/m ³)	30 mppcf
Copper (7440-50-8)		
Mexico	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
Mexico	OEL STEL (mg/m ³)	2 mg/m ³ (fume) 2 mg/m ³ (dust and mist)
USA ACGIH	ACGIH TWA (mg/m ³)	0.2 mg/m ³ (fume)
USA OSHA	OSHA PEL (TWA) (mg/m ³)	0.1 mg/m ³ (fume) 1 mg/m ³ (dust and mist)
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	1 mg/m ³ (dust and mist) 0.1 mg/m ³ (fume)
USA IDLH	US IDLH (mg/m ³)	100 mg/m ³ (dust, fume, and mist)
Alberta	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume)
British Columbia	OEL TWA (mg/m ³)	1 mg/m ³ (dust and mist)
Manitoba	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume)
New Brunswick	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume)
Newfoundland & Labrador	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume)
Nova Scotia	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume)
Nunavut	OEL STEL (mg/m ³)	0.6 mg/m ³ (fume)
Nunavut	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume)
Northwest Territories	OEL STEL (mg/m ³)	0.6 mg/m ³ (fume)
Northwest Territories	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume)
Ontario	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume)

Prince Edward Island	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume)
Québec	VEMP (mg/m ³)	0.2 mg/m ³ (fume)
Saskatchewan	OEL STEL (mg/m ³)	0.6 mg/m ³ (fume)
Saskatchewan	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume)
Yukon	OEL STEL (mg/m ³)	0.2 mg/m ³ (fume)
Yukon	OEL TWA (mg/m ³)	0.2 mg/m ³ (fume)
Manganese (7439-96-5)		
Mexico	OEL TWA (mg/m ³)	0.2 mg/m ³ 1 mg/m ³ (fume)
Mexico	OEL STEL (mg/m ³)	3 mg/m ³ (fume)
USA ACGIH	ACGIH TWA (mg/m ³)	0.02 mg/m ³ (respirable fraction) 0.1 mg/m ³ (inhalable fraction)
USA OSHA	OSHA PEL (Ceiling) (mg/m ³)	5 mg/m ³ (fume)
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	1 mg/m ³ (fume)
USA NIOSH	NIOSH REL (STEL) (mg/m ³)	3 mg/m ³
USA IDLH	US IDLH (mg/m ³)	500 mg/m ³
Alberta	OEL TWA (mg/m ³)	0.2 mg/m ³
British Columbia	OEL TWA (mg/m ³)	0.2 mg/m ³
Manitoba	OEL TWA (mg/m ³)	0.02 mg/m ³ (respirable fraction)
New Brunswick	OEL TWA (mg/m ³)	0.2 mg/m ³
Newfoundland & Labrador	OEL TWA (mg/m ³)	0.02 mg/m ³ (respirable fraction)
Nova Scotia	OEL TWA (mg/m ³)	0.02 mg/m ³ (respirable fraction)
Nunavut	OEL Ceiling (mg/m ³)	5 mg/m ³
Nunavut	OEL STEL (mg/m ³)	3 mg/m ³ (fume)
Nunavut	OEL TWA (mg/m ³)	1 mg/m ³ (fume)
Northwest Territories	OEL Ceiling (mg/m ³)	5 mg/m ³
Northwest Territories	OEL STEL (mg/m ³)	3 mg/m ³ (fume)
Northwest Territories	OEL TWA (mg/m ³)	1 mg/m ³ (fume)
Ontario	OEL TWA (mg/m ³)	0.2 mg/m ³
Prince Edward Island	OEL TWA (mg/m ³)	0.02 mg/m ³ (respirable fraction)
Québec	VEMP (mg/m ³)	0.2 mg/m ³ (total dust and fume)
Saskatchewan	OEL STEL (mg/m ³)	0.6 mg/m ³
Saskatchewan	OEL TWA (mg/m ³)	0.2 mg/m ³
Yukon	OEL Ceiling (mg/m ³)	5 mg/m ³
Chromium (7440-47-3)		
Mexico	OEL TWA (mg/m ³)	0.5 mg/m ³
USA ACGIH	ACGIH TWA (mg/m ³)	0.5 mg/m ³
USA OSHA	OSHA PEL (TWA) (mg/m ³)	1 mg/m ³
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	0.5 mg/m ³
USA IDLH	US IDLH (mg/m ³)	250 mg/m ³
Alberta	OEL TWA (mg/m ³)	0.5 mg/m ³
British Columbia	OEL TWA (mg/m ³)	0.5 mg/m ³
Manitoba	OEL TWA (mg/m ³)	0.5 mg/m ³
New Brunswick	OEL TWA (mg/m ³)	0.5 mg/m ³
Newfoundland & Labrador	OEL TWA (mg/m ³)	0.5 mg/m ³
Nova Scotia	OEL TWA (mg/m ³)	0.5 mg/m ³
Nunavut	OEL STEL (mg/m ³)	1.5 mg/m ³
Nunavut	OEL TWA (mg/m ³)	0.5 mg/m ³
Northwest Territories	OEL STEL (mg/m ³)	1.5 mg/m ³
Northwest Territories	OEL TWA (mg/m ³)	0.5 mg/m ³
Ontario	OEL TWA (mg/m ³)	0.5 mg/m ³
Prince Edward Island	OEL TWA (mg/m ³)	0.5 mg/m ³

Québec	VEMP (mg/m ³)	0.5 mg/m ³
Saskatchewan	OEL STEL (mg/m ³)	1.5 mg/m ³
Saskatchewan	OEL TWA (mg/m ³)	0.5 mg/m ³
Yukon	OEL STEL (mg/m ³)	3.0 mg/m ³
Yukon	OEL TWA (mg/m ³)	0.1 mg/m ³
Lead (7439-92-1)		
Mexico	OEL TWA (mg/m ³)	0.15 mg/m ³ (dust and fume)
USA ACGIH	ACGIH TWA (mg/m ³)	0.05 mg/m ³
USA OSHA	OSHA PEL (TWA) (mg/m ³)	50 µg/m ³
USA NIOSH	NIOSH REL (TWA) (mg/m ³)	0.050 mg/m ³
USA IDLH	US IDLH (mg/m ³)	100 mg/m ³
Alberta	OEL TWA (mg/m ³)	0.05 mg/m ³
British Columbia	OEL TWA (mg/m ³)	0.05 mg/m ³
Manitoba	OEL TWA (mg/m ³)	0.05 mg/m ³
New Brunswick	OEL TWA (mg/m ³)	0.05 mg/m ³
Newfoundland & Labrador	OEL TWA (mg/m ³)	0.05 mg/m ³
Nova Scotia	OEL TWA (mg/m ³)	0.05 mg/m ³
Nunavut	OEL STEL (mg/m ³)	0.45 mg/m ³
Nunavut	OEL TWA (mg/m ³)	0.15 mg/m ³
Northwest Territories	OEL STEL (mg/m ³)	0.45 mg/m ³
Northwest Territories	OEL TWA (mg/m ³)	0.15 mg/m ³
Ontario	OEL TWA (mg/m ³)	0.05 mg/m ³ (designated substances regulation)
Prince Edward Island	OEL TWA (mg/m ³)	0.05 mg/m ³
Québec	VEMP (mg/m ³)	0.05 mg/m ³
Saskatchewan	OEL STEL (mg/m ³)	0.15 mg/m ³
Saskatchewan	OEL TWA (mg/m ³)	0.05 mg/m ³
Yukon	OEL STEL (mg/m ³)	0.45 mg/m ³ (dust and fume)
Yukon	OEL TWA (mg/m ³)	0.15 mg/m ³ (dust and fume)

Exposure Controls

Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Avoid dust production. Avoid creating or spreading dust. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment).

Personal Protective Equipment: Safety glasses. Gloves. Insufficient ventilation: wear respiratory protection. Protective clothing.



Materials for Protective Clothing: With molten material wear thermally protective clothing.

Hand Protection: Wear chemically resistant protective gloves. If material is hot, wear thermally resistant protective gloves.

Eye Protection: Chemical goggles or face shield. Face shield.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: Use a NIOSH-approved respirator or self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits. Wear approved mask.

Environmental Exposure Controls: Do not allow the product to be released into the environment.

Consumer Exposure Controls: Do not eat, drink, or smoke during use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Solid

Odor: None

pH: Not applicable

Melting Point: 1030 - 1210°F (554-654°C)

Boiling Point: Not applicable

Auto-ignition Temperature: Not available

Flammability (solid, gas): Not available

Upper Flammable Limit: Not available

Relative Vapor Density at 20°C: Not available

Solubility: Water: None

Viscosity: Not available

Specific gravity / density: 2.69-2.72 g/cm³ (0.097-0.099 lb/ft³)

Explosion Data – Sensitivity to Mechanical impact: Not expected to present explosion hazard due to mechanical impact

Explosion Data – Sensitivity to Static Discharge: Not expected to present explosion hazard due to static discharge

Appearance: Silvery plate, rod, bar, extrusion, etc.

Order Threshold: Not applicable

Evaporation Rate: Not available

Freezing Point: Not available

Flash Point: Not available

Decomposition Temperature: Not available

Lower Flammable Limit: Not available

Vapor Pressure: Not applicable

Relative Density: Not available

Partition coefficient n-octanol/water: Not applicable

Specific Gravity: Not available

10. STABILITY AND REACTIVITY

Reactivity: Stable at ambient temperature and under normal conditions of use.

Chemical Stability: Stable under recommended handling and storage conditions (see section 7).

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Protect from moisture. Incompatible materials.

Incompatible Materials: Strong acids. Strong bases. Strong oxidizers. Water, humidity. Alkalis. Corrosive substances in contact with metals may produce flammable hydrogen gas.

Hazardous Decomposition Products: Under conditions of fire this material may produce oxides of iron, oxides of copper, oxides of aluminum, oxides of zinc.

11. TOXICOLOGICAL INFORMATION

Information on Toxicological Effects - Product

Acute Toxicity: Not classified

LD50 and LC50 Data: Not available

Skin Corrosion/Irritation: Not classified

pH: Not applicable

Serious Eye Damage/Irritation: Not classified

pH: Not applicable

Respiratory or Skin Sensitization: Not classified **Germ Cell Mutagenicity:** Not classified **Teratogenicity:** Not classified

Carcinogenicity: Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Aspiration Hazard: Not classified

Symptoms/Injuries After Inhalation: During processing, the most significant route of exposure is by the inhalation (breathing) of fumes. If fumes are inhaled, they can cause a condition commonly known as metal fume fever with symptoms which resemble influenza; Symptoms may be delayed 4-12 hours and begin with a sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms may include upper

respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude, and a generalized feeling of malaise. Fever, chills, muscular pain, mild to severe headache, nausea, occasional vomiting, exaggerated mental activity, profuse sweating, excessive urination, diarrhea, and prostration may also occur.

Symptoms/Injuries After Skin Contact: Causes severe skin burns. Contact with fumes or metal powder will irritate skin. Contact with hot, molten metal will cause thermal burns. Dust may cause irritation in skin folds or by contact in combination with tight clothing. Mechanical damage via flying particles and chipped slag is possible.

Symptoms/Injuries After Eye Contact: During metal processing, dusts caused from milling and physical alteration will likely cause eye irritation. Fumes from thermal decomposition or molten material will likely be irritating to the eyes. Mechanical damage via flying particles and chipped slag is possible.

Symptoms/Injuries After Ingestion: Ingestion is not considered a potential route of exposure.

Chronic Symptoms: Inhalation of iron oxide fumes undergoing decomposition may cause irritation and flu-like symptoms, otherwise iron oxide is not hazardous. Aluminum: Inhalation of finely divided aluminum powder may cause pulmonary fibrosis. Zinc: Prolonged exposure to high concentrations of zinc fumes may cause "zinc shakes", an involuntary twitching of the muscles. Otherwise, zinc is non-toxic. Chromium: Certain hexavalent chromium compounds have been demonstrated to be carcinogenic on the basis of epidemiological investigations on workers and experimental studies in animals. Increased incidences of respiratory cancer have been found in chromium (VI) workers. There is an increased incidence of lung cancer in industrial workers exposed to chromium (VI) compounds. Please refer to IARC volume 23 for a more detailed discussion. Silicon: Can cause chronic bronchitis and narrowing of the airways. Manganese: Chronic exposure can cause inflammation of the lung tissue, scarring the lungs (pulmonary fibrosis). Anemia.

Copper: Overexposure to fumes may cause metal fume fever (chills, muscle aches, nausea, fever, dry throat, cough, weakness, and lassitude); metallic or sweet taste; discoloration of skin and hair. Tissue damage of mucous membranes may follow chronic dust exposure. Lead: Exposure can result in lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; encephalopathy; kidney disease; hypertension.

Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

Iron (7439-89-6)	
LD50 Oral Rat	98.6 g/kg
Manganese (7439-96-5)	
LD50 Oral Rat	> 2000 mg/kg
Chromium (7440-47-3)	
LD50 Oral Rat	> 5000 mg/kg
Lead (7439-92-1)	
ATE US (oral)	500.00 mg/kg body weight
ATE US (dust, mist)	1.50 mg/l/4h
Chromium (7440-47-3)	
IARC Group	3
Lead (7439-92-1)	
IARC Group	2A
National Toxicology Program (NTP) Status	Reasonably anticipated to be Human Carcinogen.

12. ECOLOGICAL INFORMATION (non-mandatory)

Toxicity

Zinc (7440-66-6)	
LC50 Fish 1	2.16 - 3.05 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	0.139 - 0.908 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
LC 50 Fish 2	0.211 - 0.269 mg/l (Exposure time: 96 h - Species: Pimephales promelas [semi-static])
Copper (7440-50-8)	
LC50 Fish 1	<= 0.0068 (0.0068 - 0.0156) mg/l (Exposure time: 96 h - Species: Pimephales promelas)
EC50 Daphnia 1	0.03 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
EC50 Other Aquatic Organisms 1	0.0426 (0.0426 - 0.0535) mg/l (Exposure time: 72 h - Species: Pseudokirchneriella subcapitata [static])
LC 50 Fish 2	0.3 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
EC50 Other Aquatic Organisms 2	0.031 (0.031 - 0.054) mg/l (Exposure time: 96 h - Species: Pseudokirchneriella subcapitata [static])
Manganese (7439-96-5)	
NOEC chronic fish	3.6 mg/l (Exposure time: 96h; Species: Oncorhynchus mykiss)
Lead (7439-92-1)	
LC50 Fish 1	0.44 mg/l (Exposure time: 96 h - Species: Cyprinus carpio [semi-static])
EC50 Daphnia 1	600 µg/l (Exposure time: 48 h - Species: water flea)
LC 50 Fish 2	1.17 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [flow-through])

Persistence and Degradability

Copper (7440-50-8)	
Persistence and Degradability	Not readily biodegradable.

Bioaccumulative Potential: Not available

Mobility in Soil: Not available

Other Adverse Effects: Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS (non-mandatory)

Waste treatment methods

Sewage Disposal Recommendations: Do not empty into drains; dispose of this material and its container in a safe way.

Additional Information: Recycle the material as far as possible.

Ecology – Waste Materials: Avoid release to the environment.

14. TRANSPORT INFORMATION (non-mandatory)

DOT: Not regulated for transport

IMDG: Not regulated for transport

IATA: Not regulated for transport

TDG: Not regulated for transport

15. REGULATORY INFORMATION (non-mandatory)

US Federal Regulations

Aluminum (7429-90-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
SARA Section 313 - Emission Reporting	1.0 % (dust or fume only)
Silicon (7440-21-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Zinc (7440-66-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
SARA Section 313 - Emission Reporting	1.0 % (dust or fume only)
Copper (7440-50-8)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
SARA Section 313 - Emission Reporting	1.0 %
Magnesium (7439-95-4)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Iron (7439-89-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Manganese (7439-96-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
SARA Section 313 - Emission Reporting	1.0 %
Chromium (7440-47-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
SARA Section 313 - Emission Reporting	1.0 %
Lead (7439-92-1)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on United States SARA Section 313	
SARA Section 313 - Emission Reporting	0.1 %

US State Regulations

Lead (7439-92-1)	
U.S. - California - Proposition 65 - Carcinogens List	WARNING: This product contains chemicals known to the State of California to cause cancer.
U.S. - California - Proposition 65 - Developmental Toxicity	WARNING: This product contains chemicals known to the State of California to cause birth defects.
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	WARNING: This product contains chemicals known to the State of California to cause (Female) reproductive harm.
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	WARNING: This product contains chemicals known to the State of California to cause (Male) reproductive harm.

Aluminum (7429-90-5)	
U.S. - Massachusetts - Right to Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List U.S. - Pennsylvania - RTK (Right to Know) List	
Silicon (7440-21-3)	
U.S. - Massachusetts - Right to Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List	
Zinc (7440-66-6)	
U.S. - Massachusetts - Right to Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List U.S. - Pennsylvania - RTK (Right to Know) List	
Copper (7440-50-8)	
U.S. - Massachusetts - Right to Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List U.S. - Pennsylvania - RTK (Right to Know) List	
Magnesium (7439-95-4)	
U.S. - Massachusetts - Right to Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List	
Manganese (7439-96-5)	
U.S. - Massachusetts - Right to Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List U.S. - Pennsylvania - RTK (Right to Know) List	
Chromium (7440-47-3)	
U.S. - Massachusetts - Right to Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances U.S. - Pennsylvania - RTK (Right to Know) List	
Lead (7439-92-1)	
U.S. - Massachusetts - Right to Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List U.S. - Pennsylvania - RTK (Right to Know) List	

Canadian Regulations

Wrought Aluminum Products, 6xxx Series Alloys	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria
Aluminum (7429-90-5)	
Listed on the Canadian DSL (Domestic Substances List) Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1 %	
WHMIS Classification	Class B Division 6 - Reactive Flammable Material Class B Division 4 - Flammable Solid

Silicon (7440-21-3)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria
Zinc (7440-66-6)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria
Copper (7440-50-8)	
Listed on the Canadian DSL (Domestic Substances List)	
Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1 %	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria
Magnesium (7439-95-4)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class B Division 4 - Flammable Solid Class B Division 6 - Reactive Flammable Material
Iron (7439-89-6)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class B Division 4 - Flammable Solid Class B Division 6 - Reactive Flammable Material
Manganese (7439-96-5)	
Listed on the Canadian DSL (Domestic Substances List)	
Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1 %	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria
Chromium (7440-47-3)	
Listed on the Canadian DSL (Domestic Substances List)	
Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 0.1 %	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria
Lead (7439-92-1)	
Listed on the Canadian DSL (Domestic Substances List)	
Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 0.1 %	
WHMIS Classification	Class D Division 2 Subdivision A - Very toxic material causing other toxic effects Class D Division 2 Subdivision B - Toxic material causing other toxic effects

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

16. OTHER INFORMATION**GHS Full Text Phrases:**

Acute Tox. 4 (Inhalation: dust,mist)	Acute toxicity (inhalation: dust,mist) Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment - Chronic Hazard Category 1
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3
Carc. 1B	Carcinogenicity Category 1B
Comb. Dust	Combustible Dust
Flam. Sol. 1	Flammable solids Category 1
Repr. 1A	Reproductive toxicity Category 1A
Self-heat. 1	Self-heating substances and mixtures Category 1
Self-heat. 2	Self-heating substances and mixtures Category 2
STOT RE 1	Specific target organ toxicity (repeated exposure) Category 1
Water-react. 2	Substances and mixtures which in contact with water emit flammable gases Category 2
H228	Flammable solid
H232	May form combustible dust concentrations in air
H251	Self-heating; may catch fire
H252	Self-heating in large quantities; may catch fire
H261	In contact with water releases flammable gases
H302	Harmful if swallowed
H332	Harmful if inhaled
H350	May cause cancer
H360	May damage fertility or the unborn child
H372	Causes damage to organs through prolonged or repeated exposure
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

This information provided on this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designated only as a guide for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.



SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.spray (formerly ECOLINE-S), ECOBASE, ECODAMP
Product Description: Polymer Modified Asphalt Emulsion
CAS No: N/A

Manufacturer / Supplier:
EPRO Services, Inc.
PO Box 347
Derby, KS 67037
800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

GHS-US Classification of the Substance or Mixture

Carc.2: H351
STOT RE 2: H373
Aquatic Chronic 3: H412
Full text of H-phrases: see Section 16

GHS-US Label Elements

Signal Word: Warning

Hazard Statements

H351: Suspected of causing cancer
H373: May cause damage to organs (thymus, liver, bone marrow) through prolonged or repeated exposure
H412: Harmful to aquatic life with long lasting effects

Precautionary Statements

P201: Obtain special instructions before use
P202: Do not handle until all safety precautions have been read and understood
P260: Do not breathe vapors, mist, and spray
P273: Avoid release to the environment
P280: Wear eye protection, protective clothing, and protective gloves
P308+P313: If exposed or concerned, get medical advice/attention
P314: Get medical advice/attention if you feel unwell
P405: Store locked up
P501: Dispose of contents/container in accordance with local, regional, national, and international regulations

Other Hazards

Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. If stored under heat for extended periods or significantly agitated, this material might evolve or release hydrogen sulfide, a flammable gas, which can raise and widen this material's actual flammability limits and significantly lower its auto-ignition

temperature. Hydrogen sulfide is a toxic gas that can be fatal. It also has a rotten egg smell that causes odor fatigue very quickly and should not be used as an indicator for the presence of gas. Flammable vapors can accumulate in head space of closed system

Unknown Acute Toxicity (GHS-US)

Up to 30% of the mixture consists of ingredient(s) of unknown acute toxicity.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Name	Product Identifier	%	Classification (GHS-US)
Asphalt	(CAS No) 8052-42-4	50 - 70	Not classified
Water	(CAS No) 7732-18-5	30 - 40	Not classified
Proprietary Polymer	Proprietary*	< 30	Not classified
Proprietary Hydrocarbon	Proprietary*	0 - 5	Flam. Liq. 3, H226 Acute Tox. 3 (Inhalation:vapor), H331 Skin Irrit. 2, H315 Carc. 2, H351 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Acute 3, H402 Aquatic Chronic 2, H411

*The specific chemical identity and/or exact percentage of composition have been withheld as a trade secret within the meaning of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Full text of H-phrases: See Section 16

4. FIRST-AID MEASURES

Description of First Aid Measures

First-aid Measures General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice.

First-aid Measures after Inhalation: When symptoms occur go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

First-aid Measures after Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Wash contaminated clothing before reuse. Obtain medical attention if irritation develops or persists.

First-aid Measures after Eye Contact: Rinse cautiously with water for at least 5 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if redness, pain, or irritation occurs.

First-aid Measures after Ingestion: Rinse mouth. Do NOT induce vomiting. Seek medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms/Injuries: There are potential chronic health effects to consider.

Symptoms/Injuries after Inhalation: May cause respiratory irritation.

Symptoms/Injuries after Skin Contact: May cause skin irritation.

Symptoms/Injuries after Eye Contact: May cause eye irritation.

Symptoms/Injuries after Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: May cause damage to organs (Thymus, Liver, Bone Marrow) through prolonged or repeated exposure. Suspected of causing cancer

Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Dry chemical powder, alcohol-resistant foam, carbon dioxide (CO₂).

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

Application of water stream to hot product may cause frothing and increase fire intensity.

Special Hazards Arising from the Substance or Mixture

Fire Hazard: Will not support combustion unless the water has evaporated.

Explosion Hazard: Product is not explosive. Contains Sulfur, may release small amounts of hydrogen sulfide.

Hydrogen sulfide is a highly flammable, explosive gas under certain conditions, is a toxic gas, and may be fatal. Gas can accumulate in the headspace of closed containers, use caution when opening sealed containers. Heating the product or containers can cause thermal decomposition of the product and release hydrogen sulfide.

Reactivity: Hazardous reactions will not occur under normal conditions.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Do not allow run-off from firefighting to enter drains or water sources. Do not breathe fumes or vapors from fire. Use water spray or fog for cooling exposed containers.

Protection During firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Other Information: Refer to Section 9 for flammability properties.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Use special care to avoid static electric charges. Keep away from heat, sparks, open flames, hot surfaces. – No smoking.

For Non-emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

For Emergency Responders

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit.

Environmental Precautions

Prevent entry to sewers and public waters.

Methods and Material for Containment and Cleaning Up

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container. Contact competent authorities after a spill.

Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection. Concerning disposal elimination after cleaning, see item 13.

7. HANDLING AND STORAGE

Precautions for Safe Handling

Additional Hazards When Processed: Handle empty, enclosed containers with care because residual vapors may be flammable.

Precautions for Safe Handling: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Take precautionary measures against static discharge. Use only non-sparking tools. Keep away from heat, sparks, open flames, hot surfaces. – No smoking. Avoid breathing vapors, mist, spray.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment. Use explosion-proof electrical, lighting, ventilating equipment.

Storage Conditions: Store in a dry, cool, and well-ventilated place. Keep container closed when not in use.

Incompatible Products: Strong acids. Strong bases. Strong oxidizers.

Incompatible Materials: Heat sources.

Storage Temperature: > 0 °C (32 °F)

Storage Area: Store locked up.

Specific End Use(s): Asphalt Emulsion

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

For substances listed in Section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV, NIOSH (REL), or OSHA (PEL).

Asphalt (8052-42-4)		
USA ACGIH	ACGIH TWA (mg/m ³)	0.5 mg/m ³ (fume, inhalable fraction)
USA ACGIH	ACGIH chemical category	Not classifiable as a human carcinogen fume, coat tar-free
USA NIOSH	NIOSH REL (ceiling) (mg/m ³)	5 mg/m ³ (fume)

Proprietary Hydrocarbon		
USA ACGIH	ACGIH TWA (mg/m ³)	100 mg/m ³ (inhalable fraction and vapor)
USA ACGIH	ACGIH chemical category	Skin – potential significant contribution to overall exposure by the cutaneous route, Confirmed Animal Carcinogen with Unknown Relevance to Humans

Exposure Controls

Appropriate Engineering Controls: Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof equipment. Take precautionary measures against static discharges. Ensure all national/local regulations are observed. Gas detectors should be used when flammable gases/vapors may be released.

Personal Protective Equipment: Protective goggles, gloves, protective clothing. Insufficient ventilation: wear respiratory protection.

Materials for Protective Clothing: Chemically resistant materials and fabrics.

Hand Protection: Wear chemically resistant protective gloves.

Eye Protection: Chemical safety goggles.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn.

Thermal Hazard Protection: If material is hot, wear thermally resistant protective gloves.

Environmental Exposure Controls: Do not allow the product to be released into the environment.

Consumer Exposure Controls: Do not eat, drink, or smoke during use.

Other Information: When using, do not eat, drink, or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid

Odor: No data available

pH: No data available

Melting Point: Not applicable

Boiling Point: 100°C (212.00°F)

Auto-ignition Temperature: No data available

Flammability (solid, gas): No data available

Relative Vapor Density at 20°C: >1.0 (air=1)

Specific Gravity: 1.0+ / -0.2 at 60°F (15.6°C)

Viscosity: No data available

Appearance: Brown to Black

Order Threshold: No data available

Evaporation Rate: Slower (butyl acetate-1)

Freezing Point: No data available

Flash Point: No data available

Decomposition Temperature: No data available

Vapor Pressure: Not determined

Relative Density: No data available

Solubility: Water: miscible

Partition Coefficient: N-Octanol/Water: No data available

Other Information

VOC Content: 0%

Volatiles (includes water): 30 - 50%

10. STABILITY AND REACTIVITY

Reactivity: Hazardous reactions will not occur under normal conditions.

Chemical Stability: Stable under recommended handling and storage conditions (see section 7).

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Direct sunlight. Extremely high or low temperatures. Open flame. Overheating. Heat. Sparks. Do not freeze.

Incompatible Materials: Strong acids. Strong bases. Strong oxidizers.

Hazardous Decomposition Products: May release flammable gases. Thermal decomposition generates: Carbon oxides

(CO, CO₂). Nitrogen oxides. Hydrogen sulfide. Sulfur dioxide. Irritating or toxic vapors.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity: Not classified

Asphalt (8052-42-4)	
LD50 Oral Rat	> 5000 mg/kg
LD50 Dermal Rabbit	> 2000 mg/kg

Proprietary Hydrocarbon	
LD50 Dermal Rabbit	4720 µl/kg
LD50 Inhalation Rat	4.6 mg/l/4h

Skin Corrosion/Irritation: Not classified

Serious Eye Damage/Irritation: Not classified

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Carcinogenicity: Suspected of causing cancer.

Asphalt (8052-42-4)	
IARC Group	2B
National Toxicology Program (NTP) Status	Twelfth Report-Items under consideration
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list

Proprietary Polymer	
IARC group	3

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Specific Target Organ Toxicity (Repeated Exposure): May cause damage to organs through prolonged or repeated exposure.

Aspiration Hazard: Not classified

Symptoms/Injuries after Inhalation: May cause respiratory irritation.

Symptoms/Injuries after Skin Contact: May cause skin irritation.

Symptoms/Injuries after Eye Contact: May cause eye irritation.

Symptoms/Injuries after Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: May cause damage to organs (Thymus, Liver, Bone Marrow) through prolonged or repeated exposure. Suspected of causing cancer.

12. ECOLOGICAL INFORMATION

Ecology – General: This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

Ecology – Water: Harmful to aquatic life with long-lasting effects.

Proprietary Hydrocarbon	
LC50 Fish 1	35 mg/l (Exposure time: 96 h – Species: Pimephales promelas (flow-through))

Persistence and Degradability: Not established.

Bioaccumulative Potential: Not established

Asphalt (8052-42-4)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	> 6

Mobility in Soil: No additional information available.

Other Adverse Effects: Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Sewage Disposal Recommendations: Do not empty into drains. Do not dispose of waste into sewer.

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, and international regulations.

Additional Information: Handle empty containers with care because residual vapors are flammable.

14. TRANSPORT INFORMATION

DOT: Not regulated for transport

IMDG: Not regulated for transport

IATA: Not regulated for transport

15. REGULATORY INFORMATION (non-mandatory)

US Federal Regulations

SARA Section 311/312 Hazard Classes: Delayed (chronic) health hazard

TSCA (Toxic Substances Control Act) Inventory – Asphalt (8052-42-4): Listed

TSCA (Toxic Substances Control Act) Inventory – Water (7732-18-5): Listed

TSCA (Toxic Substances Control Act) Inventory – Proprietary Hydrocarbon: Listed

TSCA (Toxic Substances Control Act) Inventory – Proprietary Polymer: Listed

US State Regulations

Asphalt (8052-42-4)

Massachusetts: Right to Know List

New Jersey: Right to Know Hazardous Substance List

Pennsylvania: RTK (Right to Know) List

16. OTHER INFORMATION

GHS Full Text Phrases

Acute Tox. 3 (Inhalation:vapor)	Acute toxicity (inhalation:vapor) Category 3
Aquatic Acute 3	Hazardous to the aquatic environment - Acute Hazard Category 3
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3
Asp. Tox. 1	Aspiration hazard Category 1
Carc. 2	Carcinogenicity Category 2
Flam. Liq. 3	Flammable liquids Category 3
Skin Irrit. 2	Skin corrosion/irritation Category 2
STOT RE 2	Specific target organ toxicity (repeated exposure) Category 2
H226	Flammable liquid and vapor
H304	May be fatal if swallowed and enters airways
H315	Causes skin irritation
H331	Toxic if inhaled
H351	Suspected of causing cancer
H373	May cause damage to organs through prolonged or repeated exposure
H402	Harmful to aquatic life
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

NFPA Health Hazard: 1 – exposure could cause irritation but only minor residual injury even if not treatment is given.

NFPA Fire Hazard: 1 – must be preheated before ignition can occur

NFPA Reactivity: 0 – normally stable, even under fire exposure conditions, and are not reactive with water

This information provided on this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designated only as a guide for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.



SAFETY DATA SHEET
(conforms to HazCom 2012/United States)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.stop hpl (formerly EPROSTOP-HPL)
Synonyms: CS-231
CAS No: N/A

Supplier:
EPRO Services, Inc.
PO Box 347
Derby, KS 67037
800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

Since the product is in paste form, the risk of exposure to a carcinogen dust is minimum, this is why the related hazard statements are not shown in this SDS.

OSHA/HCS status: While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Classification of the substance or mixture: Not Classified

GHS label elements

Signal word: No signal word

Hazard statements: No known significant effects or critical hazards.

Precautionary statements

General: Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

Prevention: Not applicable

Response: Not applicable

Storage: Not applicable

Disposal: Not applicable

Hazards not otherwise classified: None known

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/mixture: Mixture

Other means of identification: Not available

CAS number/other identifiers

CAS number: Not applicable

Product code: Not available

Ingredient name	%	CAS number
Crystalline silica, quartz	10-30	14808-60-7
1-Pronene, 2-methyl-, homopolymer	5-10	9003-27-4
Titanium dioxide	1-5	1 3463-67-7
Carbon black	0.1-1	1333-86-4

Any concentration shown as a range is to protect confidentiality or is due to batch variation. There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

4. FIRST-AID MEASURES

Description of necessary first aid measures

Eye contact: Not a likely route of exposure.

Inhalation: Not a likely route of exposure.

Skin contact: No first aid should be needed.

Ingestion: Wash mouth out with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact: No known significant effects or critical hazards.

Inhalation: No known significant effects or critical hazards.

Skin contact: No known significant effects or critical hazards.

Ingestion: No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact: No known significant effects or critical hazards.

Inhalation: No known significant effects or critical hazards.

Skin contact: No known significant effects or critical hazards.

Ingestion: No known significant effects or critical hazards.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media: Carbon dioxide, dry chemical, foam and water fog or spray.

Unsuitable extinguishing media: None known

Specific hazards arising from the chemical: No specific fire or explosion hazard.

Hazardous thermal decomposition products: Decomposition materials may include the following materials:
Carbon dioxide and/or carbon monoxide

Special protective actions for firefighters: No special measures are required

Special protective equipment for firefighters: Firefighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: No action shall be taken involving any personal risk or without suitable training. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in “For non-emergency personnel.”

Environmental precautions: None required if used according to recommended conditions.

Methods and materials for contaminant and cleaning up spill: Not applicable

7. HANDLING AND STORAGE

Precautions for safe handling

Protective measures: Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored, and processed. Workers should wash hands and faces before eating, drinking and smoking. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities: Store in accordance with local regulations. Store away from direct sunlight in a dry, cool, and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Do not store in unlabeled containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Crystalline silica, quartz	OSHA PEL Z3 (United States, 2/2013). TWA: 10 mg/m ³ 8 hours. Form: Respirable TWA: 250 mppcf 8 hours Form: Respirable NIOSH REL (United States, 10/2013). TWA: 0.05 mg/m ³ 10 hours. Form: Respirable dust ACGIH TLV (United States, 4/2014). TWA: 0.025 mg/m ³ 8 hours. Form: Respirable fraction.
Titanium dioxide	OSHA PEL (United States, 2/2013). TWA: 15 mg/m ³ 8 hours. Form: Total dust ACGIH TLV (United States, 4/2014). TWA: 10 mg/m ³ 8 hours. ACGIH TLV (United States, 4/2014). TWA: 3 mg/m ³ 8 hours. Form: Inhalable fraction
Carbon Black	NIOSH REL (United States, 10/2013). TWA: 3.5 mg/m ³ 10 hours. TWA: 0.1 mg of PAHs/c m ³ 10 hours OSHA PEL (United States, 2/2013). TWA: 3.5 mg/m ³ 8 hours.

Appropriate engineering controls: Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.

Eye/face protection: Not required under normal condition of use.

Skin protection: Chemical-resistant, impervious gloves complying with an approved standard should be work at all times when handling chemical products if a risk assessment indicates this is necessary.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Solid

Color: Not available

pH: Not available

Boiling point: Not available

Burning time: Not available

Evaporation rate: Not available

Vapor pressure: Not available

Vapor density: Not available

Auto-ignition temperature: Not available

Decomposition temperature: Not available

Viscosity: Not available

Odor: Odorless

Solubility in Water: Insoluble

Melting point: Not available

Flash point: Not available

Burning rate: Not available

Flammability (solid, gas): Not available

Lower & upper explosive (flammable) limits: Not available

Relative density: Not available

Partition coefficient n-octanol/water: Not available

SADT: Not available

10. STABILITY AND REACTIVITY

Reactivity: No specific test data related to reactivity available for this product or its ingredients.

Chemical stability: The product is stable.

Possibility of hazardous reactions: Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid: No specific data.

Incompatible materials: Reactive or incompatible with the following materials: oxidizing materials. Non-reactive or compatible with the following materials: reducing materials, combustible materials, organic materials, metals, acids, alkalis, and moisture.

Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Carbon black	LD50 Oral	Rat	>1 5400 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Titanium dioxide	Skin- Mild irritant	Human	-	72 hours 300 µg intermittent	-

Sensitization

Skin: There is no data available

Respiratory: There is no data available

Mutagenicity

There is no data available

Carcinogenicity Classification

Product/ ingredient name	OSHA	IARC	NTP
Crystalline silica, quartz	-	1	Known to be a human carcinogen.
Titanium dioxide	-	2B	
Carbon black	-	2B	

There is no data available

Reproductive toxicity

There is no data available

Teratogenicity

There is no data available

Specific target organ toxicity (single exposure)

There is no data available

Specific target organ toxicity (repeated exposure)

NAME	Category	Route of exposure	Target organs
Crystalline silica, quartz	Category 1	Inhalation	Kidneys, respiratory tract and testes

Aspiration hazard

There is no data available

Information on the likely routes of exposure: Routes of entry anticipated: Oral, Dermal

Potential acute health effects

Eye contact: No known significant effects or critical hazards.

Inhalation: No known significant effects or critical hazards.

Skin contact: No known significant effects or critical hazards.

Ingestion: No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact: No known significant effects or critical hazards.

Inhalation: No known significant effects or critical hazards.

Skin contact: No known significant effects or critical hazards.

Ingestion: No known significant effects or critical hazards.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects: No known significant effects or critical hazards.

Potential delayed effects: No known significant effects or critical hazards.

Long term exposure

Potential immediate effects: No known significant effects or critical hazards.

Potential delayed effects: No known significant effects or critical hazards.

Potential chronic health effects

General: No known significant effects or critical hazards.

Carcinogenicity: No known significant effects or critical hazards.

Mutagenicity: No known significant effects or critical hazards.

Teratogenicity: No known significant effects or critical hazards.

Developmental effects: No known significant effects or critical hazards.

Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity – Acute toxicity estimates

There is no data available.

12. ECOLOGICAL INFORMATION

Toxicity

Product/ingredient name	Result	Species	Exposure
1-Propene, 2-methyl-, homopolymer Titanium dioxide	Acute LC50 >5600000 µg/L Fresh water	Fish-Oncorhynchus mykiss	96 hours
	Acute EC50 5.83 mg/L Fresh water	Algae-Pseudokirchneriella subcapitata Exponential growth phase	72 hours
	Acute LC50 3 mg/L Fresh water	Crustaceans-Ceriodaphnia dubia Neonate	48 hours
	Acute LC50 5.5 ppm Fresh water	Daphnia-Daphnia magna-Juvenile (Fledgling, Hatchling, Weanling)	48 hours
	Acute LC50 1000 mg/L Fresh water	Fish- Pimephales promelas	96 hours
	Chronic NOEC 0.984 mg/L Fresh water	Algae- Pseudokirchneriella subcapitata Exponential growth phase	72 hours

Persistence and degradability

There is no data available

Bioaccumulative potential

Product/ingredient name	LogPow	BCF	Potential
Titanium dioxide	-	352	low

Mobility in soil

Soil/water partition coefficient (KOC): Not available

Other adverse effects: No known significant effects or critical hazards.

13. DISPOSAL CONSIDERATIONS

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

14. TRANSPORT INFORMATION

	DOT Classification	IMDG	IATA
UN number	Not regulated	Not regulated	Not regulated
UN proper shipping name			
Transport hazard class			
Packing group			
Environmental hazards	NO	NO	NO
Additional information			

Special precautions for user: No special precautions are required.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not available

15. REGULATORY INFORMATION

U.S. Federal regulations: TSCA 8(a) CDR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): All components are listed or exempt.

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs): Not Listed

Clean Air Act Section 602 Class I Substances: Not listed

Clean Air Act Section 602 Class II Substances: Not listed

DEA List I Chemicals (Precursor Chemicals): Not listed

DEA List II Chemicals (Essential Chemicals): Not listed

Sara 302/304Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
No products were found						

SARA 304 RQ: Not applicable

SARA 311/312

Classification: Not applicable

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Crystalline silica, quartz	10-30	No.	No.	No.	No.	Yes.
Titanium dioxide	1-5	No.	No.	No.	No.	Yes.
Carbon black	0.1-1	No.	No.	No.	No.	Yes.

Sara 313

	Product name	CAS number	%
Form R-Reporting requirements			
Supplier notification			

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts: The following components are listed: Titanium dioxide; Crystalline silica, quartz; Talc

New York: None of the components are listed

New Jersey: The following components are listed: Titanium dioxide; Crystalline silica, quartz, Distillates (petroleum), solvent-dewaxed heavy paraffinic; Talc; Carbon black

Pennsylvania: The following components are listed: Titanium dioxide; Crystalline silica, quartz; Talc; Carbon black

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Crystalline silica, quartz	Yes	No	No	No
Titanium dioxide	Yes	No	No	No
Carbon black	Yes	No	No	No
Isoprene	Yes	No	No	No

International regulations

International lists:

Australia inventory (AICS): Not determined.

China inventory (IECSC): All components are listed or exempted.

Japan inventory: Not determined.

Korea inventory: All components are listed or exempted

Malaysia Inventory (EHS Register): Not determined.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted

Philippines inventory (PICCS): All components are listed or exempted.

Taiwan inventory (CSNN): Not determined.

Chemical Weapons Convention List Schedule I Chemicals: Not listed

Chemical Weapons Convention List Schedule II Chemicals: Not listed

Chemical Weapons Convention List Schedule III Chemicals: Not listed

16. OTHER INFORMATION

Key to abbreviations	ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL 73/78 = International Convention for the Prevention of Pollution from Ships 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) UN = United Nations
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8/24/20

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.roll (formerly ECOLINE-R)
Product Description: Polymer Modified Asphalt Emulsion
CAS No: N/A

Manufacturer / Supplier:
EPRO Services, Inc.
PO Box 347
Derby, KS 67037
800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

GHS-US Classification of the Substance or Mixture

Carc.2: H351
STOT RE 2: H373
Aquatic Chronic 3: H412
Full text of H-phrases: see Section 16

GHS-US Label Elements

Signal Word: Warning

Hazard Statements

H351: Suspected of causing cancer
H373: May cause damage to organs (thymus, liver, bone marrow) through prolonged or repeated exposure
H412: Harmful to aquatic life with long lasting effects

Precautionary Statements

P201: Obtain special instructions before use
P202: Do not handle until all safety precautions have been read and understood
P260: Do not breathe vapors, mist, and spray
P273: Avoid release to the environment
P280: Wear eye protection, protective clothing, and protective gloves
P308+P313: If exposed or concerned, get medical advice/attention
P314: Get medical advice/attention if you feel unwell
P405: Store locked up
P501: Dispose of contents/container in accordance with local, regional, national and international regulations

Other Hazards

Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. If stored under heat for extended periods or significantly agitated, this material might evolve or release hydrogen sulfide, a flammable gas, which can raise and widen this material's actual flammability limits and significantly lower its auto-ignition

temperature. Hydrogen sulfide is a toxic gas that can be fatal. It also has a rotten egg smell that causes odor fatigue very quickly and should not be used as an indicator for the presence of gas. Flammable vapors can accumulate in head space of closed system

Unknown Acute Toxicity (GHS-US)

Up to 30% of the mixture consists of ingredient(s) of unknown acute toxicity.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Name	Product Identifier	%	Classification (GHS-US)
Asphalt	(CAS No) 8052-42-4	50 - 70	Not classified
Water	(CAS No) 7732-18-5	30 - 40	Not classified
Acrysol		>1.3	Not classified
Ethanol	(CAS No) 34375-28-5	>.03	Not classified
Proprietary Polymer	Proprietary*	> 30	Not classified
Proprietary Hydrocarbon	Proprietary*	0 - 5	Flam. Liq. 3, H226 Acute Tox. 3 (Inhalation:vapor), H331 Skin Irrit. 2, H315 Carc. 2, H351 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Acute 3, H402 Aquatic Chronic 2, H411

*The specific chemical identity and/or exact percentage of composition have been withheld as a trade secret within the meaning of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Full text of H-phrases: See Section 16

4. FIRST-AID MEASURES

Description of First Aid Measures

First-aid Measures General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice.

First-aid Measures after Inhalation: When symptoms occur go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

First-aid Measures after Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Wash contaminated clothing before reuse. Obtain medical attention if irritation develops or persists.

First-aid Measures after Eye Contact: Rinse cautiously with water for at least 5 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if redness, pain, or irritation occurs.

First-aid Measures after Ingestion: Rinse mouth. Do NOT induce vomiting. Seek medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms/Injuries: There are potential chronic health effects to consider.

Symptoms/Injuries after Inhalation: May cause respiratory irritation.

Symptoms/Injuries after Skin Contact: May cause skin irritation.

Symptoms/Injuries after Eye Contact: May cause eye irritation.

Symptoms/Injuries after Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: May cause damage to organs (Thymus, Liver, Bone Marrow) through prolonged or repeated exposure. Suspected of causing cancer

Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Dry chemical powder, alcohol-resistant foam, carbon dioxide (CO₂).

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not considered flammable but will burn at high temperatures.

Explosion Hazard: Product is not explosive. Contains Sulfur. May release small amounts of hydrogen sulfide.

Hydrogen sulfide is a highly flammable, explosive gas under certain conditions, is a toxic gas, and may be fatal. Gas can accumulate in the headspace of closed containers. Use caution when opening sealed containers. Heating the product or containers can cause thermal decomposition of the product and release hydrogen sulfide.

Reactivity: Hazardous reactions will not occur under normal conditions.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Do not allow run-off from firefighting to enter drains or water sources. Do not breathe fumes or vapors from fire. Use water spray or fog for cooling exposed containers.

Protection During firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Other Information: Refer to Section 9 for flammability properties.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Use special care to avoid static electric charges. Keep away from heat, sparks, open flames, hot surfaces. – No smoking.

For Non-emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

For Emergency Responders

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit.

Environmental Precautions

Prevent entry to sewers and public waters.

Methods and Material for Containment and Cleaning Up

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container. Contact competent authorities after a spill.

Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection. Concerning disposal elimination after cleaning, see item 13.

7. HANDLING AND STORAGE

Precautions for Safe Handling

Additional Hazards When Processed: Handle empty containers with care because residual vapors may be flammable.

Precautions for Safe Handling: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Take precautionary measures against static discharge. Use only non-sparking tools. Keep away from heat, sparks, open flames, hot surfaces. – No smoking. Avoid breathing vapors, mist, spray.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment. Use explosion-proof electrical, lighting, ventilating equipment.

Storage Conditions: Store in a dry, cool, and well-ventilated place. Keep container closed when not in use.

Incompatible Products: Strong acids. Strong bases. Strong oxidizers.

Incompatible Materials: Heat sources.

Storage Temperature: > 0 °C (32 °F)

Storage Area: Store locked up.

Specific End Use(s): Asphalt Emulsion

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

For substances listed in Section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV, NIOSH (REL), or OSHA (PEL).

Asphalt (8052-42-4)		
USA ACGIH	ACGIH TWA (mg/m ³)	0.5 mg/m ³ (fume, inhalable fraction)
USA ACGIH	ACGIH chemical category	Not classifiable as a human carcinogen fume, coat tar-free
USA NIOSH	NIOSH REL (ceiling) (mg/m ³)	5 mg/m ³ (fume)

Proprietary Hydrocarbon		
USA ACGIH	ACGIH TWA (mg/m ³)	100 mg/m ³ (inhalable fraction and vapor)
USA ACGIH	ACGIH chemical category	Skin – potential significant contribution to overall exposure by the cutaneous route, Confirmed Animal Carcinogen with Unknown Relevance to Humans

Exposure Controls

Appropriate Engineering Controls: Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof equipment. Take precautionary measures against static discharges. Ensure all national/local regulations are observed. Gas detectors should be used when flammable gases/vapors may be released.

Personal Protective Equipment: Protective goggles, gloves, protective clothing. Insufficient ventilation: wear respiratory protection.

Materials for Protective Clothing: Chemically resistant materials and fabrics.

Hand Protection: Wear chemically resistant protective gloves.

Eye Protection: Chemical safety goggles.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn.

Thermal Hazard Protection: If material is hot, wear thermally resistant protective gloves.

Environmental Exposure Controls: Do not allow the product to be released into the environment.

Consumer Exposure Controls: Do not eat, drink, or smoke during use.

Other Information: When using, do not eat, drink, or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid

Odor: No data available

pH: No data available

Melting Point: Not applicable

Boiling Point: 100°C (212.00°F)

Auto-ignition Temperature: No data available

Flammability (solid, gas): No data available

Relative Vapor Density at 20°C: >1.0 (air=1)

Specific Gravity: 1.0+ / -0.2 at 60°F (15.6°C)

Viscosity: No data available

Appearance: Brown to Black

Order Threshold: No data available

Evaporation Rate: Slower (butyl acetate-1)

Freezing Point: No data available

Flash Point: No data available

Decomposition Temperature: No data available

Vapor Pressure: Not determined

Relative Density: No data available

Solubility: Water: miscible

Partition Coefficient: N-Octanol/Water: No data available

Other Information

VOC Content: 0

Volatiles (includes water): 30 - 50%

10. STABILITY AND REACTIVITY

Reactivity: Hazardous reactions will not occur under normal conditions.

Chemical Stability: Stable under recommended handling and storage conditions (see section 7).

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Direct sunlight. Extremely high or low temperatures. Open flame. Overheating. Heat. Sparks. Do not freeze.

Incompatible Materials: Strong acids. Strong bases. Strong oxidizers.

Hazardous Decomposition Products: May release flammable gases. Thermal decomposition generates: Carbon oxides

(CO, CO₂). Nitrogen oxides. Hydrogen sulfide. Sulfur dioxide. Irritating or toxic vapors.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity: Not classified

Asphalt (8052-42-4)	
LD50 Oral Rat	> 5000 mg/kg
LD50 Dermal Rabbit	> 2000 mg/kg

Proprietary Hydrocarbon	
LD50 Dermal Rabbit	4720 µl/kg
LD50 Inhalation Rat	4.6 mg/l/4h

Skin Corrosion/Irritation: Not classified

Serious Eye Damage/Irritation: Not classified

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Carcinogenicity: Suspected of causing cancer.

Asphalt (8052-42-4)	
IARC Group	2B
National Toxicology Program (NTP) Status	Twelfth Report-Items under consideration
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list

Proprietary Polymer	
IARC group	3

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Specific Target Organ Toxicity (Repeated Exposure): May cause damage to organs through prolonged or repeated exposure.

Aspiration Hazard: Not classified

Symptoms/Injuries after Inhalation: May cause respiratory irritation.

Symptoms/Injuries after Skin Contact: May cause skin irritation.

Symptoms/Injuries after Eye Contact: May cause eye irritation.

Symptoms/Injuries after Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: May cause damage to organs (Thymus, Liver, Bone Marrow) through prolonged or repeated exposure. Suspected of causing cancer.

12. ECOLOGICAL INFORMATION

Ecology – General: This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

Ecology – Water: Harmful to aquatic life with long-lasting effects.

Proprietary Hydrocarbon	
LC50 Fish 1	35 mg/l (Exposure time: 96 h – Species: Pimephales promelas (flow-through))

Persistence and Degradability: Not established.

Bioaccumulative Potential: Not established

Asphalt (8052-42-4)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	> 6

Mobility in Soil: No additional information available.

Other Adverse Effects: Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Sewage Disposal Recommendations: Do not empty into drains. Do not dispose of waste into sewer.

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, and international regulations.

Additional Information: Handle empty containers with care because residual vapors are flammable.

14. TRANSPORT INFORMATION

DOT: Not regulated for transport

IMDG: Not regulated for transport

IATA: Not regulated for transport

15. REGULATORY INFORMATION (non-mandatory)

US Federal Regulations

SARA Section 311/312 Hazard Classes: Delayed (chronic) health hazard

TSCA (Toxic Substances Control Act) Inventory – Asphalt (8052-42-4): Listed

TSCA (Toxic Substances Control Act) Inventory – Water (7732-18-5): Listed

TSCA (Toxic Substances Control Act) Inventory – Proprietary Hydrocarbon: Listed

TSCA (Toxic Substances Control Act) Inventory – Proprietary Polymer: Listed

US State Regulations

Asphalt (8052-42-4)

Massachusetts: Right to Know List

New Jersey: Right to Know Hazardous Substance List

Pennsylvania: RTK (Right to Know) List

16. OTHER INFORMATION

GHS Full Text Phrases

Acute Tox. 3 (Inhalation:vapor)	Acute toxicity (inhalation:vapor) Category 3
Aquatic Acute 3	Hazardous to the aquatic environment - Acute Hazard Category 3
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3
Asp. Tox. 1	Aspiration hazard Category 1
Carc. 2	Carcinogenicity Category 2
Flam. Liq. 3	Flammable liquids Category 3
Skin Irrit. 2	Skin corrosion/irritation Category 2
STOT RE 2	Specific target organ toxicity (repeated exposure) Category 2
H226	Flammable liquid and vapor
H304	May be fatal if swallowed and enters airways
H315	Causes skin irritation
H331	Toxic if inhaled
H351	Suspected of causing cancer
H373	May cause damage to organs through prolonged or repeated exposure
H402	Harmful to aquatic life
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

NFPA Health Hazard: 1 – exposure could cause irritation but only minor residual injury even if not treatment is given.

NFPA Fire Hazard: 1 – must be preheated before ignition can occur

NFPA Reactivity: 0 – normally stable, even under fire exposure conditions, and are not reactive with water

This information provided on this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designated only as a guide for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): PM Sealant
Product Description: Adhesives. Sealant.
Synonyms: N/A
CAS No: N/A

Supplier:
EPRO Services, Inc.
PO Box 347
Derby, KS 67037
800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

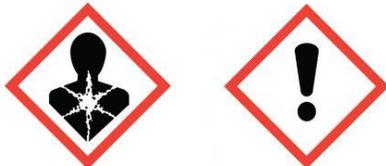
OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (49CFR1910.1200).

Classification of the substance or mixture

Acute toxicity-Oral-Category 4
Serious Eye Damage/Eye Irritation-Category 2A
Carcinogenicity-Category 1A
Reproductive Toxicity-Category 1B
Specific target organ toxicity (single exposure)-Category 1 (central nervous system)
Specific target organ toxicity (repeated exposure)-Category 1 (respiratory system)
Specific target organ toxicity (repeated exposure)-Category 2 (bladder)

GHS label elements

Hazard pictogram



Signal word: Danger

Hazard statements

Harmful if swallowed. Causes serious eye irritation. May cause cancer. May damage fertility or the unborn child. Cause damage to organs through prolonged or repeated exposure.

Precautionary statements

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear eye and face protection. Do not breathe dust/fumes/gas/mist/vapors/spray. Wash thoroughly after handling. Do not eat, drink, or smoke when using this product.

Response: If exposed, call a POISON CENTER or physician if you feel unwell. If in eyes, rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical attention. IF SWALLOWED, immediately call a POISON CENTER or physician. Rinse mouth. Get medical attention if you feel unwell.

Storage: Store locked up.

Disposal: Dispose of contents and container in accordance with all local, regional, national, and international regulations.

Statement of Unknown Acute Toxicity: Oral 71.91% of the mixture consists of ingredients of unknown acute toxicity.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient name	%	CAS Number
Calcium Carbonate	30-60	1317-65-3
Carbonic acid, calcium salt (1:1)	15-40	471-34-1
Titanium Dioxide	1-5	13463-67-7
Organosilane	1-5	2768-02-7
Dibutyltin oxide	0.1-1	818-08-6
Diisonoyl phthalate	15-40	28553-12-0
Carbon Black	0.05 - <0.1	1333-86-4

4. FIRST-AID MEASURES**Description of necessary first aid measures**

Eye contact: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses if easy to do so. Continue rinsing. If irritation persists, get medical attention.

Inhalation: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. Call poison center or physician if you feel unwell.

Skin contact: Wash with plenty of soap and water. If skin irritation or rash occurs, get medical attention. Remove contaminated clothing and wash before reuse.

Ingestion: If swallowed, immediately call a poison center or physician. DO NOT induce vomiting.

Most important symptoms/effects, acute and delayed**Acute**

Harmful if swallowed. Causes serious eye irritation.

Delayed

May cause cancer. May damage fertility or the unborn child. Causes damage to organs. Causes damage to organs through prolonged or repeated exposure. May cause damage to organs through prolonged or repeated exposure.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media: Use dry chemical, CO₂, water, or foam.

Unsuitable extinguishing media: Do not use high pressure water streams.

Specific hazards arising from the chemical: Upon decomposition, product emits carbon dioxide, carbon monoxide, and/or low molecular weight hydrocarbons.

Hazardous thermal decomposition products: Decomposition products may include carbon dioxide, carbon monoxide, and/or low molecular weight hydrocarbons.

Special protective actions for firefighters: Heating may cause an explosion. Containers may rupture or explode. Move containers from fire area if it can be done without risk. Avoid inhalation of vapors or combustion products. Dike for later disposal. Stay upwind and keep out of low areas.

Special protective equipment for firefighters: Firefighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures

Wear personal protective clothing and equipment. See Section 8.

Methods and materials for containment and cleaning up

Keep unnecessary people away. Isolate hazard area and deny entry. In case of spillage, stop the flow of material and block any potential routes to water systems. Only personnel trained for the hazards of this material should perform clean up and disposal.

Environmental Precautions

Do not flush into sanitary sewer systems, drains, or surface water. Avoid release to the environment.

7. HANDLING AND STORAGE

Precautions for safe handling

Protective measures: Do not handle until all safety precautions have been read and understood. Keep away from all ignition sources. Avoid contact with eyes or skin. Do not eat, drink, or smoke when using this product. Always wear recommended personal protective equipment (section 8). Take precautionary measures against static discharge. Avoid release to the environment. Empty containers retain product residue and can be hazardous. Do not reuse container.

Conditions for safe storage, including any incompatibilities: Store locked up and in accordance with local regulations. Store in original container in a cool dry well-ventilated area away from incompatible materials. Empty containers may contain product residue. Avoid contact with temperatures above 120°C.

Incompatible Materials: Strong oxidizer. Strong acids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Component Exposure Limits

Calcium carbonate 1317-65-3	NIOSH: 10 mg/m ³ TWA total dust; 5 mg/m ³ TWA respirable dust OSHA (US): 15 mg/m ³ TWA total dust; 5 mg/m ³ TWA respirable fraction Mexico: 10 mg/m ³ TWA VLE-PPT 20 mg/m ³ STEL (PPT-T)
Carbonic acid, calcium salt (1:1) 471-34-1	NIOSH: 10 mg/m ³ TWA total dust; 5 mg/m ³ TWA respirable dust
Titanium dioxide 13463-67-7	ACGIH: 10 mg/m ³ TWA NIOSH: 2.4 mg/m ³ TWA (CIB 63) fine; 0.3 mg/m ³ TWA (CIB 63) ultrafine, including engineered nanoscale 5000 mg/m ³ IDLH OSHA (US): 15 mg/m ³ TWA total dust Mexico: 10 mg/m ³ TWA VLE-PPT as Ti 20 mg/m ³ STEEL (PPT-CT) as Ti
Carbon Black 1333-86-4	ACGIH: 3 mg/m ³ TWA inhalable particulate matter NIOSH : 3.5 mg/m ³ TWA ; 0.1 mg/m ³ TWA (Carbon black in presence of Polycyclic aromatic hydrocarbons) as PAH 1750 mg/m ³ IDLH OSHA (US): 3.5 mg/m ³ TWA Mexico: 3.5 mg/m ³ TWA VLE-PPT 7 mg/m ³ STEL (PPT-CT)

ACGIH – Threshold Limit Values – Biological Exposure Indices (BEI): There are no biological limit values for any of this product's components.

Appropriate engineering controls: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor, or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Individual protection measures

Hygiene measures: Wash hands, forearms, and face thoroughly after handling chemical products, before eating, smoking, and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Wear splash resistance safety goggles with a face shield.

Hand protection: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Body protection: Wear appropriate chemical resistant clothing.

Respiratory protection: Use a properly fitted, air-purifying or supplied air respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Solid paste

Odor: Mild

pH: Not available

Boiling point: Not available

Flash point: 93.3°C (>200°F)

Flammability (solid, gas): Not available

Color: black, white, gray

Odor threshold: Not available

Melting point: Not available

Freezing point range: Not available

Evaporation rate: Not available

Auto-ignition temperature: Not available

Lower explosive (flammable) limit: Not available
Decomposition temperature: Not available
Vapor density: Not available
Water solubility: Slightly soluble
Viscosity: Not available
Solubility (Other): Not available
Molecular Weight: Not available

Upper explosive (flammable) limit: Not available
Vapor pressure: Not available
Specific gravity: 1.3 – 1.7
Partition coefficient n-octanol/water: Not available
Kinematic Viscosity: Not available
Density: Not available

10. STABILITY AND REACTIVITY

Reactivity: No reactivity hazard is expected.

Chemical stability: Product is stable at normal temperatures and pressure.

Possibility of hazardous reactions: Under normal conditions of storage and use hazardous will not polymerize.

Conditions to avoid: Avoid heat, flames, sparks, and other ignition sources. Avoid contact with incompatible materials and temperatures above 120°C (248°F).

Incompatible materials: Strong oxidizers and strong acids.

Hazardous decomposition products: Upon decomposition, this product emits carbon monoxide, carbon dioxide, and/or molecular weight hydrocarbons.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effect

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Carbonic acid, calcium salt (1:1)	Oral LD50	Rat	6450 mg/kg	4 hours
Titanium dioxide	Oral LD50	Rat	> 10000 mg/kg	
Organosilane	Oral LD50	Rat	7340 ml/kg	
Dibutyltin oxide	Oral LD50	Rat	44.9 mg/kg	
Diisononyl phthalate	Oral LD50	Rat	> 9750 mg/kg	
	Inhalation LC50	Rat	> 4.4 mg/l	
Carbon black	Oral LD50	Rat	> 15400 mg/kg	
Product toxicity- acute toxicity estimated	Oral LD50		1261.24 mg/kg	

Immediate effects: Harmful if swallowed. Causes serious eye irritation. May cause skin irritation. May be harmful if inhaled.

Acute Toxicity Estimate: Oral: 1261.241 mg/kg

Delayed effects: May cause cancer. May damage fertility or the unborn child. Causes damage to organs. Causes damage to organs through prolonged or repeated exposure.

Irritation/Corrosion: Causes serious eye irritation.

Respiratory Sensitization: No information on significant adverse effects.

Dermal Sensitization: No information on significant adverse effects.

Component Carcinogenicity

Product/ingredient name	ACGIH	IARC	OSHA	NIOSH
Titanium Dioxide	A 4	Group 2 B	Yes	Potential Occupational Carcinogen
Carbon black	A 3	Group 2 B	Yes	Potential Occupational Carcinogen

Results of a DuPont epidemiology study showed that employees who had been exposed to titanium dioxide pigments were at no greater risks of developing lung cancer than were employees who had not been exposed to titanium dioxide pigments. No pulmonary fibrosis was found in any of the employees and no associations were observed between titanium dioxide pigment exposure and chronic respiratory disease or lung

abnormalities. Based on the results of this study, DuPont has concluded that titanium dioxide pigment will not cause lung cancer or chronic respiratory disease in humans at concentrations experienced in the workplace.

Germ Cell Mutagenicity: No information on significant adverse effects.

Tumorigenic Data: No information on significant adverse effects.

Reproductive toxicity: May damage fertility or the unborn child.

Specific target organ toxicity (single exposure): Central nervous system.

Specific target organ toxicity (repeated exposure): Respiratory system, bladder.

Aspiration hazard: No information on significant adverse effects.

Medical Conditions Aggravated by Exposure: No data available.

12. ECOLOGICAL INFORMATION (non-mandatory)

Toxicity: May cause long lasting harmful effects to aquatic life.

Product/ingredient name	Result	Species	Exposure
Diisononyl phthalate	LC50 100 mg/l (semi static)	Brachydanio rerio	96 hours
	LC50 > 0.14 mg/l (flow thru)	Lepomis macrochirus	96 hours
	LC50 > 0.17 mg/l (static)	Lepomis macrochirus	96 hours
	LC50 > 0.19 mg/l (flow thru)	Pimephales promelas	96 hours
	LC50 > 0.14 mg/l (static)	Pimephales promelas	96 hours
	EC50 > 500 mg/l (IUCLID)	Desmodesmus subspicatus	72 hours
	EC50 > 1.8 mg/l (static)	Pseudokirchneriella	96 hours
	EC50 > 500 mg/l (IUCLID)	Daphnia magna	48 hours
	EC50 > 0.06 mg/l (static)	Daphnia magna	48 hours

13. DISPOSAL CONSIDERATIONS (non-mandatory)

Disposal methods: Dispose of in accordance with all applicable local, state, regional, and federal regulations.

Component Waste Numbers: The US EPA has not published waste numbers for this product components.

14. TRANSPORT INFORMATION (non-mandatory)

DOT: Not regulated as a dangerous good.

IATA: Not regulated as a dangerous good.

ICAO: Not regulated as a dangerous good.

IMDG: Not regulated as a dangerous good.

International Bulk Chemical Code: This material contains one or more of the following chemicals required by the IBC Code to be identified as dangerous chemicals in bulk.

Titanium dioxide (13463-67-7): IBC Code – Category Z (slurry)

15. REGULATORY INFORMATION (non-mandatory)

US Federal regulations: None of this product's components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

SARA 311/312: Carcinogenicity. Acute Toxicity. Reproductive Toxicity. Serious Eye damage/Eye irritation. Specific Target Organ Toxicity.

State regulations

California: The following components are listed: Carbon Black

Massachusetts: The following components are listed: Calcium carbonate, Titanium dioxide & Carbon Black

Minnesota: The following components are listed: Calcium carbonate, Titanium dioxide & Carbon Black

New Jersey: The following components are listed: Calcium carbonate, Titanium dioxide & Carbon Black

Pennsylvania: The following components are listed: Calcium carbonate, Titanium dioxide & Carbon Black

California Prop. 65

WARNING: This product can expose you to chemicals including Titanium dioxide, Diisononyl phthalate, and carbon black, which are known to the State of California to cause cancer.

Titanium dioxide: carcinogen, 9/2/2011 (airborne, unbound particles of respirable size)

Diisononyl phthalate: carcinogen, 12/20/2013

Carbon black: carcinogen, 2/21/2003 (airborne, unbound particles of respirable size)

Canada Regulations

Canadian WHMIS Ingredient Disclosure List (IDL): Components of this material have been checked against the list. The List is composed of chemicals which must be identified on MSDSs if they are included in products which meet WHMIX criteria specified in the Controlled Products Regulations and are present above the threshold limits listed on the IDL.

Dibutyltin oxide (818-08-6): 1%

Carbon black (1333-86-4): 1%

Component Analysis – Inventory

	Calcium carbonate	Carbonic acid,calcium salt ((1:1)	Titanium dioxide	Organosilane	Dibutyltin oxide	Diisononyl phthalate	Carbon black
	1317-65-3	471-34-1	13463-67-7	2768-02-7	818-08-6	28553-12-0	1333-86-4
US	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CA	NSL	DSL	DSL	DSL	DSL	DSL	DSL
EU	EIN	EIN	EIN	EIN	EIN	EIN	EIN
AU	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PH	Yes	Yes	Yes	Yes	Yes	Yes	Yes
JP-ENCS	Yes	Yes	Yes	Yes	Yes	Yes	Yes
JP-ISHL	Yes	Yes	Yes	Yes	Yes	Yes	Yes
KR KECI Annex 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes
KR KECI Annex 2	No	No	No	No	No	No	No
KR-REACH CCA	No	No	No	No	No	No	No
CN	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NZ	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MX	Yes	Yes	Yes	Yes	No	Yes	Yes
TW	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VN (draft)	Yes	Yes	Yes	Yes	Yes	Yes	Yes

16. OTHER INFORMATION

This information provided on this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designated only as a guide for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.



8/24/20

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.trowel (formerly ECOLINE-T)
Product Description: Polymer Modified Asphalt Emulsion
CAS No: N/A

Manufacturer / Supplier:
EPRO Services, Inc.
PO Box 347
Derby, KS 67037
800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

GHS-US Classification of the Substance or Mixture

Carc.2: H351
STOT RE 2: H373
Aquatic Chronic 3: H412
Full text of H-phrases: see Section 16

GHS-US Label Elements

Signal Word: Warning

Hazard Statements

H351: Suspected of causing cancer
H373: May cause damage to organs (thymus, liver, bone marrow) through prolonged or repeated exposure
H412: Harmful to aquatic life with long lasting effects

Precautionary Statements

P201: Obtain special instructions before use
P202: Do not handle until all safety precautions have been read and understood
P260: Do not breathe vapors, mist, and spray
P273: Avoid release to the environment
P280: Wear eye protection, protective clothing, and protective gloves
P308+P313: If exposed or concerned, get medical advice/attention
P314: Get medical advice/attention if you feel unwell
P405: Store locked up
P501: Dispose of contents/container in accordance with local, regional, national and international regulations

Other Hazards

Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. If stored under heat for extended periods or significantly agitated, this material might evolve or release hydrogen sulfide, a flammable gas, which can raise and widen this material's actual flammability limits and significantly lower its auto-ignition

temperature. Hydrogen sulfide is a toxic gas that can be fatal. It also has a rotten egg smell that causes odor fatigue very quickly and should not be used as an indicator for the presence of gas. Flammable vapors can accumulate in head space of closed system

Unknown Acute Toxicity (GHS-US)

Up to 30% of the mixture consists of ingredient(s) of unknown acute toxicity.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixture

Name	Product Identifier	%	Classification (GHS-US)
Asphalt	(CAS No) 8052-42-4	50 - 70	Not classified
Water	(CAS No) 7732-18-5	30 - 40	Not classified
Acrysol		>1.5	Not classified
Ethanol	(CAS No) 34375-28-5	>.03	Not classified
Proprietary Polymer	Proprietary*	> 30	Not classified
Proprietary Hydrocarbon	Proprietary*	0 - 5	Flam. Liq. 3, H226 Acute Tox. 3 (Inhalation:vapor), H331 Skin Irrit. 2, H315 Carc. 2, H351 STOT RE 2, H373 Asp. Tox. 1, H304 Aquatic Acute 3, H402 Aquatic Chronic 2, H411

*The specific chemical identity and/or exact percentage of composition have been withheld as a trade secret within the meaning of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Full text of H-phrases: See Section 16

4. FIRST-AID MEASURES

Description of First Aid Measures

First-aid Measures General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice.

First-aid Measures after Inhalation: When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

First-aid Measures after Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Wash contaminated clothing before reuse. Obtain medical attention if irritation develops or persists.

First-aid Measures after Eye Contact: Rinse cautiously with water for at least 5 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if redness, pain, or irritation occurs.

First-aid Measures after Ingestion: Rinse mouth. Do NOT induce vomiting. Seek medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms/Injuries: There are potential chronic health effects to consider.

Symptoms/Injuries after Inhalation: May cause respiratory irritation.

Symptoms/Injuries after Skin Contact: May cause skin irritation.

Symptoms/Injuries after Eye Contact: May cause eye irritation.

Symptoms/Injuries after Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: May cause damage to organs (Thymus, Liver, Bone Marrow) through prolonged or repeated exposure. Suspected of causing cancer

Indication of Any Immediate Medical Attention and Special Treatment Needed

If you feel unwell, seek medical advice.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Dry chemical powder, alcohol-resistant foam, carbon dioxide (CO₂).

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

Special Hazards Arising From the Substance or Mixture

Fire Hazard: Not considered flammable but will burn at high temperatures.

Explosion Hazard: Product is not explosive. Contains Sulfur. May release small amounts of hydrogen sulfide.

Hydrogen sulfide is a highly flammable, explosive gas under certain conditions, is a toxic gas, and may be fatal. Gas can accumulate in the headspace of closed containers. Use caution when opening sealed containers. Heating the product or containers can cause thermal decomposition of the product and release hydrogen sulfide.

Reactivity: Hazardous reactions will not occur under normal conditions.

Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Do not allow run-off from firefighting to enter drains or water sources. Do not breathe fumes or vapors from fire. Use water spray or fog for cooling exposed containers.

Protection During firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.

Other Information: Refer to Section 9 for flammability properties.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Use special care to avoid static electric charges. Keep away from heat, sparks, open flames, hot surfaces. – No smoking.

For Non-emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel.

For Emergency Responders

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit.

Environmental Precautions

Prevent entry to sewers and public waters.

Methods and Material for Containment and Cleaning Up

For Containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Absorb and/or contain spill with inert material, then place in suitable container. Contact competent authorities after a spill.

Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection. Concerning disposal elimination after cleaning, see item 13.

7. HANDLING AND STORAGE

Precautions for Safe Handling

Additional Hazards When Processed: Handle empty containers with care because residual vapors may be flammable.

Precautions for Safe Handling: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Take precautionary measures against static discharge. Use only non-sparking tools. Keep away from heat, sparks, open flames, hot surfaces. – No smoking. Avoid breathing vapors, mist, spray.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment. Use explosion-proof electrical, lighting, ventilating equipment.

Storage Conditions: Store in a dry, cool, and well-ventilated place. Keep container closed when not in use.

Incompatible Products: Strong acids. Strong bases. Strong oxidizers.

Incompatible Materials: Heat sources.

Storage Temperature: > 0 °C (32 °F)

Storage Area: Store locked up.

Specific End Use(s): Asphalt Emulsion

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

For substances listed in Section 3 that are not listed here, there are no established exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV, NIOSH (REL), or OSHA (PEL).

Asphalt (8052-42-4)		
USA ACGIH	ACGIH TWA (mg/m ³)	0.5 mg/m ³ (fume, inhalable fraction)
USA ACGIH	ACGIH chemical category	Not classifiable as a human carcinogen fume, coat tar-free
USA NIOSH	NIOSH REL (ceiling) (mg/m ³)	5 mg/m ³ (fume)

Proprietary Hydrocarbon		
USA ACGIH	ACGIH TWA (mg/m ³)	100 mg/m ³ (inhalable fraction and vapor)
USA ACGIH	ACGIH chemical category	Skin – potential significant contribution to overall exposure by the cutaneous route, Confirmed Animal Carcinogen with Unknown Relevance to Humans

Exposure Controls

Appropriate Engineering Controls: Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof equipment. Take precautionary measures against static discharges. Ensure all national/local regulations are observed. Gas detectors should be used when flammable gases/vapors may be released.

Personal Protective Equipment: Protective goggles, gloves, protective clothing. Insufficient ventilation: wear respiratory protection.

Materials for Protective Clothing: Chemically resistant materials and fabrics.

Hand Protection: Wear chemically resistant protective gloves.

Eye Protection: Chemical safety goggles.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn.

Thermal Hazard Protection: If material is hot, wear thermally resistant protective gloves.

Environmental Exposure Controls: Do not allow the product to be released into the environment.

Consumer Exposure Controls: Do not eat, drink, or smoke during use.

Other Information: When using, do not eat, drink, or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid

Odor: No data available

pH: No data available

Melting Point: Not applicable

Boiling Point: 100°C (212.00°F)

Auto-ignition Temperature: No data available

Flammability (solid, gas): No data available

Relative Vapor Density at 20°C: >1.0 (air=1)

Specific Gravity: 1.0+ / -0.2 at 60°F (15.6°C)

Viscosity: No data available

Appearance: Brown to Black

Order Threshold: No data available

Evaporation Rate: Slower (butyl acetate-1)

Freezing Point: No data available

Flash Point: No data available

Decomposition Temperature: No data available

Vapor Pressure: Not determined

Relative Density: No data available

Solubility: Water: miscible

Partition Coefficient: N-Octanol/Water: No data available

Other Information

VOC Content: 0

Volatiles (includes water): 30 - 50%

10. STABILITY AND REACTIVITY

Reactivity: Hazardous reactions will not occur under normal conditions.

Chemical Stability: Stable under recommended handling and storage conditions (see section 7).

Possibility of Hazardous Reactions: Hazardous polymerization will not occur.

Conditions to Avoid: Direct sunlight. Extremely high or low temperatures. Open flame. Overheating. Heat. Sparks. Do not freeze.

Incompatible Materials: Strong acids. Strong bases. Strong oxidizers.

Hazardous Decomposition Products: May release flammable gases. Thermal decomposition generates: Carbon oxides

(CO, CO₂). Nitrogen oxides. Hydrogen sulfide. Sulfur dioxide. Irritating or toxic vapors.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity: Not classified

Asphalt (8052-42-4)	
LD50 Oral Rat	> 5000 mg/kg
LD50 Dermal Rabbit	> 2000 mg/kg

Proprietary Hydrocarbon	
LD50 Dermal Rabbit	4720 µl/kg
LD50 Inhalation Rat	4.6 mg/l/4h

Skin Corrosion/Irritation: Not classified

Serious Eye Damage/Irritation: Not classified

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Carcinogenicity: Suspected of causing cancer.

Asphalt (8052-42-4)	
IARC Group	2B
National Toxicology Program (NTP) Status	Twelfth Report-Items under consideration
OSHA Hazard Communication Carcinogen List	In OSHA Hazard Communication Carcinogen list

Proprietary Polymer	
IARC group	3

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Specific Target Organ Toxicity (Repeated Exposure): May cause damage to organs through prolonged or repeated exposure.

Aspiration Hazard: Not classified

Symptoms/Injuries after Inhalation: May cause respiratory irritation.

Symptoms/Injuries after Skin Contact: May cause skin irritation.

Symptoms/Injuries after Eye Contact: May cause eye irritation.

Symptoms/Injuries after Ingestion: Ingestion is likely to be harmful or have adverse effects.

Chronic Symptoms: May cause damage to organs (Thymus, Liver, Bone Marrow) through prolonged or repeated exposure. Suspected of causing cancer.

12. ECOLOGICAL INFORMATION

Ecology – General: This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

Ecology – Water: Harmful to aquatic life with long-lasting effects.

Proprietary Hydrocarbon	
LC50 Fish 1	35 mg/l (Exposure time: 96 h – Species: Pimephales promelas (flow-through))

Persistence and Degradability: Not established.

Bioaccumulative Potential: Not established

Asphalt (8052-42-4)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	> 6

Mobility in Soil: No additional information available.

Other Adverse Effects: Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Sewage Disposal Recommendations: Do not empty into drains. Do not dispose of waste into sewer.

Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, and international regulations.

Additional Information: Handle empty containers with care because residual vapors are flammable.

14. TRANSPORT INFORMATION

DOT: Not regulated for transport

IMDG: Not regulated for transport

IATA: Not regulated for transport

15. REGULATORY INFORMATION (non-mandatory)

US Federal Regulations

SARA Section 311/312 Hazard Classes: Delayed (chronic) health hazard

TSCA (Toxic Substances Control Act) Inventory – Asphalt (8052-42-4): Listed

TSCA (Toxic Substances Control Act) Inventory – Water (7732-18-5): Listed

TSCA (Toxic Substances Control Act) Inventory – Proprietary Hydrocarbon: Listed

TSCA (Toxic Substances Control Act) Inventory – Proprietary Polymer: Listed

US State Regulations

Asphalt (8052-42-4)

Massachusetts: Right to Know List

New Jersey: Right to Know Hazardous Substance List

Pennsylvania: RTK (Right to Know) List

16. OTHER INFORMATION

GHS Full Text Phrases

Acute Tox. 3 (Inhalation:vapor)	Acute toxicity (inhalation:vapor) Category 3
Aquatic Acute 3	Hazardous to the aquatic environment - Acute Hazard Category 3
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3
Asp. Tox. 1	Aspiration hazard Category 1
Carc. 2	Carcinogenicity Category 2
Flam. Liq. 3	Flammable liquids Category 3
Skin Irrit. 2	Skin corrosion/irritation Category 2
STOT RE 2	Specific target organ toxicity (repeated exposure) Category 2
H226	Flammable liquid and vapor
H304	May be fatal if swallowed and enters airways
H315	Causes skin irritation
H331	Toxic if inhaled
H351	Suspected of causing cancer
H373	May cause damage to organs through prolonged or repeated exposure
H402	Harmful to aquatic life
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

NFPA Health Hazard: 1 – exposure could cause irritation but only minor residual injury even if not treatment is given.

NFPA Fire Hazard: 1 – must be preheated before ignition can occur

NFPA Reactivity: 0 – normally stable, even under fire exposure conditions, and are not reactive with water

This information provided on this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designated only as a guide for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.



SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): Calcium Chloride
Chemical Name: Calcium Chloride
Synonyms: DOWFLAKE

Supplier:
EPRO Services, Inc.
PO Box 347
Derby, KS 67037
800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

OSHA Regulatory Status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Emergency Overview

Color: White
Appearance: Flakes
Odor: Odorless
Signal Word: Warning

MAJOR HEALTH HAZARDS: CAUSES SERIOUS EYE IRRITATION. CAUSES SKIN IRRITATION. HARMFUL IF SWALLOWED.

PHYSICAL HAZARDS: Heat is generated when mixed with water or aqueous acid solutions.

PRECAUTIONARY STATEMENTS: Avoid contact with eyes. Wash thoroughly after handling.

GHS Classification:

GHS: CONTACT HAZARD - SKIN:	Category 2 - Causes skin irritation
GHS: CONTACT HAZARD - EYE:	Category 2A - Causes serious eye irritation
GHS: ACUTE TOXICITY - ORAL:	Category 4 - Harmful if swallowed

UNKNOWN ACUTE TOXICITY: A percentage of this product consists of ingredient(s) of unknown acute toxicity.

Unknown Acute Dermal Toxicity: 3% of this product consists of ingredient(s) of unknown acute dermal toxicity.

GHS Symbol: Exclamation mark
GHS Signal Word: Warning

GHS Hazard Statements

GHS - Health Hazard Statement(s)

Causes serious eye irritation
Causes skin irritation
Harmful if swallowed

GHS - Precautionary Statement(s) - Prevention

Wear eye and face protection
Wear protective gloves
Wash thoroughly after handling
Do not eat, drink, or smoke when using this product

GHS - Precautionary Statement(s) - Response

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention
IF ON SKIN: Wash with plenty of water
Take off contaminated clothing and wash it before reuse
If skin irritation occurs: Get medical advice/attention
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
Rinse mouth
Specific treatment (see First Aid information on product label and/or Section 4 of the SDS)

GHS - Precautionary Statement(s) - Storage

There are no Precautionary-Storage phrases assigned

GHS - Precautionary Statement(s) - Disposal

Dispose of contents and container in accordance with applicable local, regional, national, and/or international regulations

Additional Hazard Information

Mixing with water may cause heat to be released

See Section 11: Toxicological Information

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Percent [%]	CAS Number
Calcium chloride	> 83 - < 87	10043-52-4
Water	> 8 - < 14	7732-18-5
Potassium Chloride	> 2 - < 3	7447-40-7
Sodium Chloride	> 1 - < 2	7647-14-5

Notes: Potassium chloride and sodium chloride are impurities from the naturally occurring source material, brine solution.

4. FIRST-AID MEASURES

INHALATION: If inhalation of dust occurs and adverse effects result, remove to uncontaminated area. Call a Poison Center or doctor/physician if you feel unwell.

SKIN CONTACT: If on skin, wash with plenty of water. If skin irritation occurs: Get medical advice/ attention. Take off contaminated clothing and wash before reuse. **SPECIFIC TREATMENT:** Wash with lots of water.

EYE CONTACT: If in eyes, rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If irritation occurs, get medical advice/attention.

INGESTION: If swallowed, rinse mouth. Contact a poison center or doctor/physician if you feel unwell. Most

Important Symptoms/Effects (Acute and Delayed):

Acute Symptoms/Effects:

Inhalation (Breathing): Inhaling dust may cause irritation to upper respiratory tract (nose and throat). Nasal mucosal and oropharyngeal erythema.

Skin: Skin Irritation. Direct abrasion of skin from solid, erythema and burn from reaction with water. Prolonged contact and occlusion may cause more severe symptoms. Damage is localized to contact areas.

Eye: Eye Irritation. Direct abrasion of cornea from solid, erythema and burn from reaction with water, conjunctival swelling and cornea opacification from hypertonic solution and heat. Corneal eye pain, redness, acute corneal thickening, or whitening.

Ingestion (Swallowing): Consumption of solids or hypertonic solutions causes nausea, vomiting, and increased thirst.

Delayed Symptoms/Effects:

Chronic exposures to skin and mucus membranes that cause irritation may cause a chronic dermatitis or mucosal membrane problem

Interaction with Other Chemicals Which Enhance Toxicity: None known.

Medical Conditions Aggravated by Exposure: Any skin condition that disrupts the skin, such as abrasions, cuts, psoriasis, fungal infections, etc. Any upper respiratory conditions that compromise mucosa can increase local damage from dust contact. Any eye condition that compromises tear production, conjunctiva, or normal corneal homeostasis.

Protection of First Aiders: At minimum, treating personnel should utilize PPE sufficient for prevention of bloodborne pathogen transmission. If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Notes to Physician: Due to irritant properties, resulting from heat created as solid material dissolves in water, swallowing may result in burns/ulceration of mucus membranes. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE-FIGHTING MEASURES

Fire Hazard: This material does not burn.

Extinguishing Media: Use extinguishing agents appropriate for surrounding fire

Fire Fighting: Keep unnecessary people away, isolate hazard area and deny entry. This material does not burn. Fight fire for other material that is burning. Water should be applied in large quantities as fine spray. Wear NIOSH approved positive-pressure self-contained breathing apparatus operated in pressure demand mode. Wear protective fire-fighting clothing (includes fire-fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire-fighting operations. If contact is likely, change to full chemical resistant fire-fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

Hazardous Combustion Products: Formed under fire conditions: hydrogen chloride gas, calcium oxide

Sensitivity to Mechanical Impact: Not sensitive.

Sensitivity to Static Discharge: Not sensitive.

Lower Flammability Level (air): Not applicable

Upper Flammability Level (air): Not applicable

Flash point: Not applicable

Auto-ignition Temperature: Not applicable

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Spilled material may cause a slipping hazard on some surfaces. Use appropriate safety equipment. For additional information refer to Section 8, Exposure Controls and Personal Protection. Refer to Section 7, Handling, for additional precautionary measures.

Methods and Materials for Containment and Cleaning Up: Small and large spills: Contain spilled material if possible. Collect in suitable and properly labeled containers. Flush residue with plenty of water. See Section 13, Disposal considerations, for additional information.

Environmental Precautions: Prevent large spills from entering soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. HANDLING AND STORAGE

Precautions for Safe Handling:

Heat developed during diluting or dissolving is very high. Use cool water when diluting or dissolving (temperature less than 80°F, 27°C). Avoid contact with eyes, skin, and clothing. Do not swallow. Wash thoroughly after handling. See Section 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Safe Storage Conditions:

Store in a dry place. Protect from atmospheric moisture. Keep container tightly closed. Keep separated from incompatible substances (see below or Section 10 of the Safety Data Sheet).

Incompatibilities/ Materials to Avoid:

Heat is generated when mixed with water or aqueous acids. Spattering and boiling can occur. Avoid contact with bromide trifluoride, 2-furan percarboxylic acid because calcium chloride is incompatible with those substances. Contact with zinc forms flammable hydrogen gas, which can be explosive. Catalyzes exothermic polymerization of methyl vinyl ether. Attacks metals in the presence of moisture and may release flammable hydrogen gas. Reaction of bromide impurity with oxidizing materials may generate trace levels of impurities such as bromates.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Regulatory Exposure Limit(s): Listed below for the product components that have regulatory occupational exposure limits (OEL's) established.

Component	OSHA Final PEL TWA	OSHA Final PEL STEL	OSHA Final PEL Ceiling
Particles Not Otherwise Regulated (PNOR) 00-00-001	15 mg/m ³ (Total) 5 mg/m ³ (Respirable)	---	---

OEL: Occupational Exposure Limit; OSHA: United States Occupational Safety and Health Administration.
PEL: Permissible Exposure Limit; TWA: Time Weighted Average; STEL: Short Term Exposure Limit

Non-Regulatory Exposure Limit(s): Listed below for the product components that have advisory (non-regulatory) occupational exposure limits (OEL's) established.

The Non-Regulatory United States Occupational Safety and Health Administration (OSHA) limits, if shown, are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993).

The American Conference of Governmental Industrial Hygienists (ACGIH) is a voluntary organization of professional industrial hygiene personnel in government or education institutions in the US. The ACGIH develops and publishes recommended occupational exposure limits each year called Threshold Limit Values (TLVs) for hundreds of chemicals, physical agents, and biological exposure indices.

Additional Advice: Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

ENGINEERING CONTROLS: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Wear safety glasses with side-shields. For dusty operations or when handling solutions of the material, wear chemical goggles.

Skin and Body Protection: Wear clean, body-covering clothing.

Hand Protection: Use gloves chemically resistant to this material. If hands are cut or scratched, use gloves chemically resistant to this material even for brief exposures. Examples of preferred glove barrier materials include: Neoprene, Polyvinyl chloride ("PVC" or "vinyl"), Nitrile/butadiene rubber ("nitrile" or "NBR"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. In dusty or misty atmospheres, use an

approved particulate respirator. The following should be effective types of air-purifying respirators: High efficiency particulate air (HEPA) N95. A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Flakes	Color: White
Odor: Odorless	Order Threshold (ppm): No data available
Molecular Formula: CaCl ₂	Decomposition Temperature: N/A
Boiling Point/Range: N/A to solids	Freezing Point/Range: N/A to solids
Melting Point/Range: 772°C (1,422°F)	Vapor Pressure: Negligible at ambient temperature
Vapor Density (air=1): N/A	Specific Gravity (water=1): N/A to solids
Bulk Density: 51 – 61 lb/ft ³	Water Solubility: Readily soluble
pH: N/A to solids	Volatility: N/A
Evaporation Rate (ether=1): N/A	Flash point: N/A
Flammability (solid, gas): N/A	Lower Flammability Level (Air): N/A
Upper Flammability Level (Air): N/A	Auto-ignition Temperature: N/A
Viscosity: N/A	Hygroscopic: Yes
Partition Coefficient (n-octane/water): No data available	

10. STABILITY AND REACTIVITY

Reactivity: Hygroscopic. Liberates large amounts of heat when dissolving in water or aqueous acids.

Chemical Stability: Stable at normal temperatures and pressures.

Possibility of Hazardous Reactions: Avoid moisture.

Conditions to Avoid: (e.g., static discharge, shock, or vibration) -. None known.

Incompatibilities/ Materials to Avoid: Heat is generated when mixed with water or aqueous acids. Spattering and boiling can occur. Avoid contact with bromine trifluoride, 2-furan percarboxylic acid because calcium chloride is incompatible with those substances. Contact with zinc forms flammable hydrogen gas, which can be explosive. Catalyzes exothermic polymerization of methyl vinyl ether. Attacks metals in the presence of moisture and may release flammable hydrogen gas. Reaction of bromide impurity with oxidizing materials may generate trace levels of impurities such as bromates

Hazardous Decomposition Products: Formed under fire conditions: hydrogen chloride gas, calcium oxide

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

LD50 Oral: 1126 mg/kg-Oral Acute Toxicity Estimate (ATE)	LD50 Dermal: 2637 mg/kg-Dermal Acute Toxicity Estimate (ATE)	LC50 Inhalation: No data is available
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OMPONENT TOXICITY DATA: The component toxicity data is populated by the LOLI database and may differ from the product toxicity data given.

POTENTIAL HEALTH EFFECTS

Eye contact: For solid: May cause slight eye irritation, mechanical injury only. Dust formation should be avoided, as dust can cause severe eye irritation with corneal injury.

Skin contact: Brief contact is essentially nonirritating to skin. Prolonged contact may cause skin irritation, even a burn. Not classified as corrosive to the skin according to DOT guidelines. May cause more severe response if skin is damp, abraded (scratched or cut), or covered by clothing, gloves, or footwear.

Inhalation: Dust may cause irritation to upper respiratory tract (nose and throat).

Ingestion: Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause local mucosal damage to esophagus and stomach. Swallowing may result in gastrointestinal irritation or ulceration.

Chronic Effects: Chronic exposures to calcium chloride that cause irritation may cause a chronic dermatitis or mucosal membrane problem. For the minor component(s): POTASSIUM CHLORIDE: In animals, effects have been reported on the following organs after ingestion: Gastrointestinal tract, heart, and kidney. Dose levels producing these effects were many times higher than any dose levels expected from exposure due to use. SODIUM CHLORIDE: Medical experience with sodium chloride has shown a strong association between elevated blood pressure and prolonged dietary overuse. Related effects could occur in the kidneys.

SIGNS AND SYMPTOMS OF EXPOSURE

Solution and or solids may be visible on the skin and or eyes. Localized redness, warmth, and irritation consistent with mechanism of injury: abrasion, burn, hypertonic solution.

Inhalation (Breathing): Inhaling dust may cause irritation to upper respiratory tract (nose and throat). Nasal mucosal and oropharyngeal erythema.

Skin: Skin Irritation. Direct abrasion of skin from solid, erythema and burn from reaction with water. Prolonged contact and occlusion may cause more severe symptoms. Damage is localized to contact areas.

Eye: Eye Irritation. Direct abrasion of cornea from solid, erythema and burn from reaction with water, conjunctival swelling and cornea opacification from hypertonic solution and heat. Corneal eye pain, redness, acute corneal thickening, or whitening.

Ingestion (swallowing): Consumption of solids or hypertonic solutions causes nausea, vomiting, and increased thirst.

Interaction with Other Chemicals Which Enhance Toxicity: None known.

GHS Health Hazards

GHS: Acute Toxicity – Oral: Category 4 – Harmful if swallowed.

GHS: Contact Hazard – Eye: Category 2A – Causes serious eye irritation

GHS: Contact Hazard – Skin: Category 2 – Causes Skin irritation.

Skin Absorbent / Dermal Route: No

MUTAGENIC DATA: Not classified as a mutagen per GHS criteria. The data presented are for the following material: Calcium chloride (CaCl₂) - In vitro genetic toxicity studies were negative. The data presented are for the following material: Potassium chloride - In vitro genetic toxicity studies were positive. However, the relevance of this to humans is unknown. For the minor component(s): Sodium chloride - In vitro genetic toxicity studies were predominantly negative.

DEVELOPMENTAL TOXICITY: Not classified as a developmental or reproductive toxin per GHS criteria. For the major component(s): Did not cause birth defects or any other fetal effects in laboratory animals.

12. ECOLOGICAL INFORMATION

Component	Freshwater Fish	Invertebrate Toxicity	Algae Toxicity	Other Toxicity
Calcium chloride	-LC50, bluegill (<i>Lepomis macrochirus</i>): 8350 – 10650 mg/l	-LC50, water flea <i>Daphnia magna</i> : 759 – 3005 mg/l	No data available	No data available
Potassium Chloride	-LC50, rainbow trout (<i>Oncorhynchus mykiss</i>), 96 h: 4,236 mg/l	-EC50, water flea <i>Daphnia magna</i> , 24 h, immobilization: 590 mg/l -LC50, water flea <i>Ceriodaphnia dubia</i> , 96 h: 3,470 mg/l	No data available	No data available
Sodium Chloride	-LC50, fathead minnow (<i>Pimephales promelas</i>) 10,610 mg/l	-LC50, water flea <i>Daphnia magna</i> : 4,571 mg/l	-IC50, OECD 209 Test; activated sludge, respiration inhibition: >1,000 mg/l	-IC50, OECD 209 Test; activated sludge, respiration inhibition: >1,000 mg/l

Aquatic Toxicity

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested)

Invertebrate Toxicity:

Calcium Chloride: LC50, water flea *Daphnia magna*: 759 - 3,005 mg/l

Potassium Chloride: EC50, water flea *Daphnia magna*, 24 h, immobilization: 590 mg/l LC50, water flea *Ceriodaphnia dubia*, 96 h: 3,470 mg/l

Sodium Chloride: LC50, water flea *Daphnia magna*: 4,571 mg/l

FATE AND TRANSPORT

BIODEGRADATION: This material is inorganic and not subject to biodegradation.

PERSISTENCE: Calcium chloride is believed not to persist in the environment because it is readily dissociated into calcium and chloride ions in water. Calcium chloride released into the environment is thus likely to be distributed into water in the form of calcium and chloride ions. Calcium ions may remain in soil by binding to soil particulate or by forming stable salts with other ions. Chloride ions are mobile and eventually drain into surface water. Both ions originally exist in nature, and their concentrations in surface water will depend on various factors, such as geological parameters, weathering, and human activities.

BIOCONCENTRATION: No bioconcentration is expected because of the relatively high-water solubility. Potential for mobility in soil is very high (Koc between 0 and 50). Partitioning from water to n-octanol is not applicable.

BIOACCUMULATIVE POTENTIAL: Calcium chloride and its dissociated forms (calcium and chloride ions) are ubiquitous in the environment. Calcium and chloride ions can also be found as constituents in organisms. Considering its dissociation properties, calcium chloride is not expected to accumulate in living organisms.

MOBILITY IN SOIL: Calcium chloride is not expected to be absorbed in soil due to its dissociation properties and high-water solubility. It is expected to dissociate into calcium and chloride free ions, or it may form stable inorganic or organic salts with other counter ions, leading to different fates between calcium and chloride ions in soil and water components. Calcium ions may bind to soil particulate or may form stable inorganic salts with sulfate and carbonate ions. The chloride ion is mobile in soil and eventually drains into surface water because it is readily dissolved in water.

13. DISPOSAL CONSIDERATIONS

Waste from material

Reuse or reprocess, if possible. All disposal practices must be in compliance with all Federal, State/Provincial, and local laws and regulations. Regulations may vary in different locations. Report spills if applicable. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN SDS SECTION: Composition Information. FOR UNUSED AND UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Landfill and wastewater treatment system.

Container Management

Dispose of container in accordance with applicable local, regional, national, and/or international regulations. Container must be disposed of in compliance with applicable regulations.

14. TRANSPORT INFORMATION

Land Transport

U.S. DOT 49 CFR 172.101 Status: Not Regulated.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS Status: Not Regulated.

Maritime Transport

(IMO / IMDG) Status: Not Regulated

15. REGULATORY INFORMATION

U.S. Regulations

OSHA Regulatory Status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

CERCLA Sections 102a/103 Hazardous Substances (40 CFR 302.4): Not regulated

SARA EHS Chemical (40 CFR 355.30): Not regulated

EPCRA Sections 311/312 Hazard Categories (40 CFR 370.10): Acute Health Hazard

EPCRA Section 313 (40 CFR 372.65): To the best of our knowledge product does not contain chemicals at levels which require reporting under this statute

OSHA Process Safety (PSM) (29 CFR 1910.119): Not regulated

National Inventory Status

US Inventory Status: Toxic Substance Control Act (TSCA): All components are listed or exempt.

TSCA 12(b): This product is not subject to export notification.

Canadian Chemical Inventory: All components of this product are listed on either the DSL or the HDSL.

Component	DSL	NDSL
Calcium chloride 10043-52-4	Listed	Not Listed
Potassium Chloride 7447-40-7	Listed	Not Listed
Sodium Chloride 7647-14-5	Listed	Not Listed

STATE REGULATIONS

California Proposition 65:

This product is not listed, but it may contain impurities/trace elements known to the State of California to cause cancer or reproductive toxicity as listed under Proposition 65 State Drinking Water and Toxic Enforcement Act. WARNING: This product (when used in aqueous formulations with a chemical oxidizer such as ozone) may react to form calcium bromate, a chemical known to the State of California to cause cancer.

Component	California Proposition 65 Cancer WARNING:	California Proposition 65 CRT List - Male reproductive toxin:	California Proposition 65 CRT List - Female reproductive toxin:	Massachusetts Right to Know Hazardous Substance List	New Jersey Right to Know Hazardous Substance List	New Jersey Special Health Hazards Substance List
Calcium chloride 10043-52-4	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
Potassium Chloride 7447-40-7	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
Sodium Chloride 7647-14-5	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed

Component	New Jersey - Environmental Hazardous Substance List	Pennsylvania Right to Know Hazardous Substance List	Pennsylvania Right to Know Special Hazardous Substances	Pennsylvania Right to Know Environmental Hazard List	Rhode Island Right to Know Hazardous Substance List
Calcium chloride 10043-52-4	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
Potassium Chloride 7447-40-7	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed
Sodium Chloride 7647-14-5	Not Listed	Not Listed	Not Listed	Not Listed	Not Listed

Canadian Regulations

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

Component	Canadian Chemical Inventory:	NDSL:	WHMIS - Classifications of Substances:
Calcium chloride	Listed		D2B
Potassium Chloride	Listed		Uncontrolled product according to WHMIS classification criteria
Sodium Chloride	Listed		Uncontrolled product according to WHMIS classification criteria

16. OTHER INFORMATION

This information provided on this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designated only as a guide for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.



SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.poly (formerly Polyester)

Product Description: polyester fabric

Synonyms: N/A

CAS No: N/A

Supplier:

EPRO Services, Inc.

PO Box 347

Derby, KS 67037

800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

Classification

OSHA Regulatory Status

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Oral	Not classified
Acute toxicity - Dermal	Not classified
Acute toxicity - Inhalation (Gases)	Not classified
Acute toxicity - Inhalation (Vapors)	Not classified
Acute toxicity - Inhalation (Dusts/Mists)	Not classified
Skin corrosion/irritation	Not classified
Serious eye damage/eye irritation	Not classified
Respiratory sensitization	Not classified
Skin sensitization	Not classified
Germ cell mutagenicity	Not classified
Carcinogenicity	Not classified
Reproductive toxicity	Not classified
Specific target organ toxicity (single exposure)	Not classified
Specific target organ toxicity (repeated exposure)	Not classified
Aspiration toxicity	Not classified

Label elements

Hazard Statements: None

Physical state: Solid

Precautionary Statements-Prevention: Not applicable

Precautionary Statements-Disposal: Not applicable

Other Information: 100% of mixture consists of ingredient(s) of unknown toxicity

Appearance: Reinforced fabric/sheet

Order: Slight/None

Precautionary Statements-Storage: Not applicable

Hazards not otherwise classified (HNOC): N/A

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

The product contains no substances which at their given concentration, are considered to be hazardous to health.

Chemical Name	Cas No	Weight-%	Trade Secret
Polyester Fabric	NA - Mixture	60 - 100	*

*The exact percentage (concentration) of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

Description of first aid measures

Eye Contact: Rinse thoroughly with plenty of water for at least 15 minutes. Consult a physician.

Skin contact: Wash with soap and water.

Inhalation: Remove to fresh air.

Ingestion: Clean mouth with water and drink afterwards plenty of water.

Most important symptoms and effects, both acute and delayed

Symptoms: No information available.

Indication of any immediate medical attention and special treatment needed

Note to physicians: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media CAUTION: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the chemical

No information available.

Explosion data

Sensitivity to Mechanical Impact: None.

Sensitivity to Static Discharge: None.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions: Ensure adequate ventilation, especially in confined areas.

Environmental precautions

See section 12 for additional ecological information.

Methods and material for containment and cleaning up

Methods for containment: Prevent further leakage or spillage if safe to do so.

Methods for cleaning up: Pick up and transfer to properly labeled containers.

7. HANDLING AND STORAGE

Precautions for safe handling

Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Storage Conditions: Keep containers tightly closed in a dry, cool and well-ventilated place.

Incompatible materials: None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines: This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Appropriate engineering controls

Engineering Controls Showers, Eyewash stations, Ventilation systems

Individual protection measures, such as personal protective equipment

Eye/face protection: Wear safety glasses with side shields (or goggles).

Skin and body protection: Wear protective gloves and protective clothing.

Respiratory protection: If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

General Hygiene Considerations: Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state: Solid

Appearance: Reinforced fabric/sheet

Odor: Slight/None

Color: White

Odor threshold: No information available

Property	Values	Remarks • Method
pH	Not applicable	
Melting point / freezing point	No information available	
Boiling point / boiling range	> 100 °C	
Flash point	> 100 °C	
Evaporation rate	No information available	
Flammability (solid, gas)	No information available	
Flammability Limit in Air		
Upper flammability limit:	No information available	
Lower flammability limit:	No information available	
Vapor pressure	No information available	
Vapor density	No information available	
Relative density	>1	
Water solubility	No information available	
Solubility in other solvents	No information available	
Partition coefficient	No information available	
Auto-ignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Dynamic viscosity	No information available	
Explosive properties	No information available	
Oxidizing properties	No information available	
<u>Other Information</u>		
Softening point	No information available	
Molecular weight	No information available	
VOC Content (%)	No information available	
Density	No information available	
Bulk density	No information available	

10. STABILITY AND REACTIVITY

Reactivity

No data available.

Chemical stability

Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Conditions to Avoid

Extremes of temperature and direct sunlight.

Incompatible materials

None known based on information supplied.

Hazardous Decomposition Products

None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information: No data available

Inhalation: None known.

Eye contact: None known.

Skin contact: None known.

Ingestion: No data available.

Information on toxicological effects

Symptoms: No information available.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization: No information available.

Germ cell mutagenicity: No information available.

Carcinogenicity: No information available.

Reproductive toxicity: No information available.

STOT - single exposure: No information available.

STOT - repeated exposure: No information available.

Aspiration hazard: No information available.

Numerical measures of toxicity - Product Information

ATEmix (oral) 99,999.00

ATEmix (dermal) 99,999.00

ATEmix (inhalation-gas) 99,999.00

ATEmix (inhalation-dust/mist) 99,999.00

ATEmix (inhalation-vapor) 99,999.00

12. ECOLOGICAL INFORMATION (non-mandatory)

Ecotoxicity

None known.

100% of the mixture consists of component(s) of unknown hazards to the aquatic environment.

Persistence and degradability

No information available.

Bioaccumulation

Bioaccumulative potential.

Other Adverse effects

No information available.

Ozone

Not applicable.

13. DISPOSAL CONSIDERATIONS (non-mandatory)

Waste treatment methods

Disposal of wastes: Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated packaging: Do not reuse container.

14. TRANSPORT INFORMATION (non-mandatory)

DOT: Not regulated

TDG: Not regulated

IATA: Not regulated

IMDG: Not regulated

15. REGULATORY INFORMATION (non-mandatory)

International Inventories

TSCA	Complies
DSL/NDSL	Complies
EINECS/ELINCS	Complies
ENCS	Does not comply
IECSC	Complies
KECL	Complies
PICCS	Complies
AICS	Complies

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances **ENCS** - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

AICS - Australian Inventory of Chemical Substances

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

Sara 311/312 Hazard Categories

Acute health hazard	No
Chronic Health Hazard	No
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

US State Regulations**California Proposition 65**

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations**U.S. EPA Label Information**

EPA Pesticide Registration Number: Not applicable.

16. OTHER INFORMATION

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SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.catalyst

Product Description: liquid calcium chloride

Synonyms: Liquid Calcium Chloride, Food Grade Liquid Calcium Chloride

CAS No: 10043-52-4

Supplier:

EPRO Services, Inc.

PO Box 347

Derby, KS 67037

800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

Serious Eye Damage/Eye Irritation – Category 2

Signal Word: Warning

Hazard Statements

*Causes serious eye irritation

Appearance: Colorless to amber

Physical State: Liquid

Odor: Odorless

Precautionary Statements

Prevention

*Wash face, hands, and any exposed skin thoroughly after handling

*Wear eye/face protection

Response

*If IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do.

Continue rinsing.

*If eye irritation persists: Get medical advice/attention.

Storage: None

Disposal: None

Hazard Not Otherwise Classified (HNOC): Not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

*The exact percentage (concentration) of composition has been withheld as a trade secret.

Chemical Name	CAS-No	Weight %	Trade Secret
Calcium Chloride	10043-52-4	20-40	*

4. FIRST-AID MEASURES

Description of necessary first-aid measures

Eye Contact: Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. If symptoms persist, call a physician.

Skin Contact: Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. If symptoms persist, call a physician.

Inhalation: Move to fresh air in case of accidental inhalation of vapors. Remove from exposure, lie down. If symptoms persist, call a physician.

Ingestion: Rinse mouth. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Drink plenty of water. Consult a physician.

Most important symptoms/effects, acute and delayed

Most Important Symptoms/Effects Irritation

Indication of immediate medical attention and special treatment needed, if necessary

Notes to Physician: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media No information available.

Specific Hazards Arising from the Chemical

No information available.

Explosion Data

Sensitivity to Mechanical Impact None.

Sensitivity to Static Discharge None.

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures

Personal Precautions: Avoid contact with the skin and the eyes. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Do not touch or walk through spilled material.

Advice for emergency responders: Wear personal protective equipment.

Environmental Precautions

Environmental Precautions: Prevent product from entering drains. See Section 12 for additional Ecological Information.

Methods and materials for containment and cleaning up

Methods for Containment: Prevent further leakage or spillage if safe to do so. Dike far ahead of spill; use dry sand to contain the flow of material

Methods for Cleaning Up: Soak up with inert absorbent material. Pick up and transfer to properly labeled containers. After cleaning, flush away traces with water. Prevent product from entering drains.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling: Handle in accordance with good industrial hygiene and safety practice. Wear personal protective equipment. Avoid contact with skin, eyes, and clothing. Do not breathe vapors or spray mist.

Conditions for safe storage, including any incompatibilities

Storage: Keep container tightly closed in a dry and well-ventilated place. Keep in properly labeled containers.

Incompatible Products: None known based on information supplied.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Calcium Chloride 10043-52-4	ACGIH - (TLV-TWA) Guideline for nuisance particulate (inhalable particulate): 10 mg/m ³	OSHA (PEL-TWA) - Z-3 Mineral Dusts, Inert or Nuisance dusts, (respirable fraction): 5 mg/m ³	-

Appropriate engineering controls

Engineering Measures: When there is a potential for exposure, an emergency eyewash and safety shower should be provided within the immediate work area.

Individual protection measures, such as personal protective equipment

Eye/Face Protection: Wear safety glasses with non-flexible side shields or chemical goggles. A face shield should be worn if a potential for splashing or spraying exists.

Skin and Body Protection: Wear appropriate protective non-leather protective gloves and boots. Wear appropriate protective, impervious clothing. Chemical protective gloves and boots such as PVC, Neoprene, or Heavy Nitrile are recommended. Leather products do not offer adequate protection and will dehydrate with resultant shrinkage and possible destruction.

Respiratory Protection: Respirator (N95 or greater) should be based on the presence of nuisance dusts.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State	Liquid	Appearance	Colorless to amber
Odor	Odorless	Odor Threshold	No information available

<u>Property</u>	<u>Values</u>	<u>Remarks/ - Method</u>
pH	3.8 - 9.0	None known
Melting Point/Range	Not determined	None known
Boiling Point/Boiling Range	118 °C / 244 °F	for 38% liquid solution
Flash Point	Not applicable.	None known
Evaporation rate	No data available	None known
Flammability (solid, gas)	No data available	None known
Flammability Limits in Air		
upper flammability limit	No data available	
lower flammability limit	No data available	
Vapor Pressure	No data available	None known
Vapor Density	No data available	None known
Specific Gravity	1.376 @ 25 C (77 F) for 38% solution	None known
Water Solubility	Completely soluble	None known
Solubility in other solvents	No data available	None known
Partition coefficient: n-octanol/water	Not determined	None known
Autoignition Temperature	No data available	None known
Decomposition Temperature	No data available	None known
Viscosity	Not applicable	None known
Flammable Properties	Not flammable	
Explosive Properties	No data available	
Oxidizing Properties	No data available	
<u>Other Information</u>		
VOC Content (%)	Not applicable	

10. STABILITY AND REACTIVITY

Reactivity: No data available.

Chemical stability: Stable under recommended storage conditions.

Possibility of hazardous reactions: None under normal processing.

Hazardous Polymerization: Hazardous polymerization does not occur.

Conditions to avoid: None known based on information supplied.

Incompatible materials: None known based on information supplied.

Hazardous decomposition products: None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Inhalation: May cause irritation.

Eye Contact: Irritating to eyes.

Skin Contact: Slightly toxic by dermal absorption.

Ingestion: May cause irritation.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Calcium Chloride	=2301 mg/kg (Rat)	=2630 mg/kg (Rat)	

Symptoms related to the physical, chemical, and toxicological characteristics

Symptoms: No information available.

Delayed and immediate effects and chronic effects from short- and long-term exposure

Sensitization: No information available.

Mutagenic Effects: No information available.

Carcinogenicity: Contains no ingredients above reportable quantities listed as a carcinogen.

Reproductive Toxicity: No information available.

STOT - single exposure: No information available.

STOT - repeated exposure: No information available.

Aspiration Hazard: No information available.

Numerical measures of toxicity – Product: No information available.

12. ECOLOGICAL INFORMATION (non-mandatory)

Ecotoxicity

The environmental impact of this product has not been fully investigated.

Chemical Name	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Daphnia Magna (Water Flea)
Calcium Chloride 10043-52-4		LC50 96 h: = 10650 mg/L static (<i>Lepomis macrochirus</i>)		LC50 48 h: = 2400 mg/L (<i>Daphnia magna</i>)

Persistence and Degradability: No information available.

Bioaccumulation: No information available.

Other Adverse Effects: No information available.

13. DISPOSAL CONSIDERATIONS (non-mandatory)

Waste Disposal Methods: This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). This material could become a hazardous waste if it is mixed with or otherwise comes in contact with a hazardous waste, if chemical additions are made to this material, or if the material is processed or otherwise altered. Consult 40 CFR 261 to determine whether the altered material is a hazardous waste. Consult the appropriate state, regional, or local regulations for additional requirements.

Contaminated Packaging: Do not re-use empty containers.

14. TRANSPORT INFORMATION (non-mandatory)

DOT: Not regulated

IATA: Not regulated

IMDG: Not regulated

15. REGULATORY INFORMATION (non-mandatory)

International Inventories

Legend

TSCA – United States Toxic Substances Control Act Section 8(b) Inventory

DLS/NDSL – Canadian Domestic Substances List/Non-Domestic Substances List

U.S. Federal Regulations

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	No
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

Clean Water Act

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

U.S. State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

U.S. EPA Label Information

EPA Pesticide Registration Number: Not Applicable

16. OTHER INFORMATION

NFPA	Health Hazard 1	Flammability 0	Instability 0	
HMIS	Health Hazard 1	Flammability 0	Physical Hazard 0	Personal Protection X

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7/1/20

SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.drain (formerly ECODRAIN-E), e.drain 6000 (formerly ECODRAIN-S6000), e.drain 6200 (formerly ECODRAIN-S6200), e.drain 9000 (formerly ECODRAIN-S9000), e.drain 990 (formerly ECORAIN-S990), e.drain ds (ECODRAIN-DS)

Product Description: Dimpled HDPE Sheet

Chemical Name: Polyethylene Compounds

Chemical Family: Polyolefin

CAS No: N/A

Supplier:

EPRO Services, Inc.

PO Box 347

Derby, KS 67037

800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

Based on pertinent data available, these products are considered “articles” and are not hazardous under OSHA Hazard Communication Standard (29 CFR 1910.1200). GHS Label Elements not required.

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product does not meet the definition given in 29 CFR 1910.1200 for hazardous material and composition is not required.

<u>NO</u>	<u>Components</u>	<u>CAS No.</u>	<u>OSHA PEL</u>
1	Polyethylene	9002-88-4	Not established
2	Polypropylene	9003-07-0	Not established
3	Proprietary	Mixtures	Not established

4. FIRST-AID MEASURES

Inhalation: Not likely in current form

Ingestion: Not likely in current form

Eye Contact: As with any foreign object, flush with water. If pain or irritation persists, consult physician.

Skin Contact: Wash with soap and water. In case of irritation, consult physician.

5. FIRE-FIGHTING MEASURES

Extinguishing Media: Dry chemical, carbon dioxide or foam.

Special Fire Fighting Procedures: Wear NIOSH approved, positive pressure, self-contained breathing apparatus (SCBA) and full protective clothing. Extinguish fires with foam or dry chemical. Do not use water jet.

Unusual Fire and Explosion Hazards: Avoid accumulation and dispersion of dust to reduce explosion potential.

Fire may produce irritating gases and dense smoke.

6. ACCIDENTAL RELEASE MEASURES

Spill is not applicable. Sold in solid form.

7. HANDLING AND STORAGE

Handling: Wear safety glasses during cutting and fabricating processes. Electrostatic charge may build up during handling. Grounding of equipment is recommended.

Handling: No special handling unless large rolls are used. Use lifting devices, as necessary.

Storage: Store in a dry place and away from direct sunlight.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Emergency Overview: Practically nontoxic

Primary Route(s) of Exposure: Inhalation, Eye, Skin Contact

Potential Health Effects and Symptoms of Over-Exposure

Negligible hazard at room temperature under normal use.

Eye Contact: Solid flake or dust may cause transient irritation as a result of mechanical abrasion.

Skin Contact: Essentially no irritation to skin. Mechanical injury only. Hot solid may cause thermal burns.

Inhalation: Exposure to dust at high concentration may cause irritation to respiratory tract.

Ingestion: May cause choking if swallowed.

Medical Conditions Aggravated by Overexposure: Not expected. Film is generally accepted as being biologically inert. No specific antidotal treatment, symptomatic support required.

Carcinogenicity: NTP: No IARC: No OSHA: No

Eye Protection: As required by site-specific conditions. Not normally required.

Skin Protection: Gloves required when handling hot material. Not normally required.

Respiratory Protection: None required in normal use of product. NIOSH approved dust mask recommended if dust conditions exist.

Engineering Control: Ventilation Requirements — General

General ventilation should be sufficient. However, if operating conditions create high airborne concentrations of this material, special ventilation may be needed. If handling results in dust generation, special ventilation may be needed to ensure that dust exposure does not exceed the OSHA PEL for nuisance dust.

Required Work/Hygiene Procedure: Minimize contact with skin. Do not eat, drink, or smoke in work area. Wash hands thoroughly after handling, especially before eating drinking, smoking, chewing, or using restroom facility. Dusted clothing and shoes should be thoroughly cleaned before use.

Exposure guidelines

<u>No.</u>	<u>Components</u>	<u>OSHA-PEL</u>	<u>ACGIH-TLV</u>
1	Polyethylene	None	None
2	Polypropylene	None	None

9. PHYSICAL AND CHEMICAL PROPERTIES

Flash Point: Greater than 400°
Autoignition: Not applicable
Flammable Limits in Air (LEL, %): Not applicable
(UEL, %): Not applicable
Physical Form: Solid
Color: Black
Odor: Insignificant
Boiling Point: Not applicable
Melting Point: ~ 320°F
Freezing Point: Not applicable
Solubility in Water: None
Specific Gravity: Less than 1 (water = 1)
Vapor Density: Not applicable (air = 1)
Evaporation Rate: None (Butyl acetate = 1)
Vapor Pressure: Not applicable
% Volatile: None
pH: Not applicable

10. STABILITY AND REACTIVITY

Stability: Stable
Conditions to Avoid: Strong oxidizers
Hazardous Decomposition: Carbon dioxide, carbon monoxide
Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

Inhalation: Not likely under normal use
Injection: Not likely under normal use
Ingestion: Not likely under normal use
Skin Contact: Prolonged contact may cause irritation to some individuals

Eye Effects: Not toxic, may irritate eyes
Skin Effects: Not toxic, may irritate skin
Target Organs: None
Chronic: No known health effects from long term use or contact
Carcinogenicity: The IARC evaluation is the "Carbon black (airborne, unbound particles of respirable size) is possibly carcinogenic to humans (Group 2B)"
Mutagenicity & Reproductive Effects: Not believed to be mutagenic or a reproductive hazard
The information provided below can be subject to misinterpretation. Therefore, it is essential the following information be interpreted by individuals trained in its evaluation.

Chemical

Polyethylene and Polypropylene: No toxicology data available.

Polyethylene and polypropylene are not considered hazardous materials under the OSHA Hazard Communication Standard

12. ECOLOGICAL INFORMATION

Environmental Data: Not expected to be hazardous to the environment in present form.

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with Federal, State, and local environmental control regulations.

14. TRANSPORT INFORMATION

DOT Shipping Name: Not listed
DOT Label: Not regulated
DOT Hazard Class: Not applicable
UN/NA Number: Not applicable
Hazard Label(s): Not applicable
Hazard Placard(s): Not applicable
Packing Group: Not applicable
Bulk Packaging: Not applicable
RQ: Not applicable
Emergency Response Guide (ERG) No.: Not applicable

15. REGULATORY INFORMATION

FEDERAL REGULATORY INFORMATION – Polyethylene, Polypropylene

OSHA Status: None

EPA Clean Air Act Status: None

EPA Clean Water Act Status: None

TSCA Status: All ingredients are listed on TSCA Inventory (40 CFR710)

CERCLA RQ: None

USA TSCA: This product is considered an article and is exempt from TSCA requirements.

Canada Domestic Substances List (DSL): This product is not specified on the DSL or NDSL.

SARA Title III Polyethylene, Polypropylene

<u>Section 302*</u>	<u>Section 313**</u>	<u>Section 311/312***</u>
None	None	None

*Reportable quantity of extremely hazardous substance, Sec. 302

*Threshold planning quantity, extremely hazardous substance, Sec. 302

**Toxic chemical. Sec. 313

**Category as required by Sec 313 (40CFR372.65C). Must be used on Toxic Release Inventory form.

***Hazard category for SARA Sec311/312 reporting H1=acute health hazard, H2=chronic health hazard, P3=fire hazard, P4 sudden release of pressure hazard, P5=reactive hazard

California Proposition 65: Carbon Black (airborne, unbound particles of respirable size), CAS# 1333-86-4 is listed as a possible carcinogen.

Canada Regulations (WHMIS): Not listed

RCRA Status: If disposed of in its purchased form, this would not be a RCRA hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal whether a material containing the product or derived from the product should be classified as a hazardous waste (40CFR261.20-24).

OTHER REGULATORY INFORMATION

The following chemicals are specifically listed by individual states; other product-specific health and safety data in other sections of the SDS may also be applicable for state requirements. For details on your regulatory requirements, you should contact the appropriate agency in your state.

<u>State</u>	<u>Chemical</u>	<u>Regulation</u>
None	Polyethylene	None
None	Polypropylene	None

International

None

16. OTHER INFORMATION

NFPA

Fire—1

Health—0

Reactivity—0

Specific Hazard—None

HMIS

Health - 0

Flammability - 1

Reactivity - 0

Personal Protection Index - E

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SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.term strip (formerly Term Bar)

CAS No: N/A

Supplier:

EPRO Services, Inc.

PO Box 347

Derby, KS 67037

800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

CONTAINS NO HAZARDOUS INGREDIENTS.

3. COMPOSITION/INFORMATION ON INGREDIENTS

PE Strip

4. FIRST-AID MEASURES

None.

5. FIRE-FIGHTING MEASURES

Flash Point: (°C) 350

Extinguishing Materials: All

Unusual Fire and Explosion Hazards Burns from Molten Material – First Aid: Cool with water. Do not remove material. Call physician.

Hazardous Combustion Products: Do not inhale combustion gases

6. ACCIDENTAL RELEASE MEASURES

Not applicable. Material is normally in solid form.

7. HANDLING AND STORAGE

Storage Requirements: Keep away from ignition sources

Personal Protective Equipment Respiratory Protection, Hand Protection, Eye Protection: None

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

No protective measures are required under normal process conditions.

9. PHYSICAL AND CHEMICAL PROPERTIES

Change in Physical State (°C): 120 – 160 Density (g/cm³) 0.960

Area Weight (g/m²): 400 – 1000 Thermal Decomposition (°C) > 300

Explosion Limits None Hazardous Reactions: None

Hazardous Decomposition Products: combustible gas

10. STABILITY AND REACTIVITY

None

11. TOXICOLOGICAL INFORMATION

No hazardous materials.

12. ECOLOGICAL INFORMATION (non-mandatory)

13. DISPOSAL CONSIDERATIONS

Dispose of according to State and Local regulations.

Disposal Pure Polyolefins: waste code no. 57128

Other Pure Plastic Refuse: waste code no. 57129

Impure Plastic Sheet: waste code no. 57119

14. TRANSPORT INFORMATION

Contains no hazardous ingredients.

15. REGULATORY INFORMATION (non-mandatory)

16. OTHER INFORMATION

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SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.tape 106 (formerly ECOTAPE)

Product Description: Pressure sensitive tape

Synonyms: N/A

CAS No: N/A

Supplier:

EPRO Services, Inc.

PO Box 347

Derby, KS 67037

800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

This product is considered safe to health and the environment with normal use.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Backing: Low density polyethylene, colored.

Adhesive: Synthetic rubber and resins, clear.

No reportable hazardous substances or complex substances.

4. FIRST-AID MEASURES

Inhalation: No first aid measures normally required.

Ingestion: No first aid measures normally required. If ingested, consult a physician if pain or discomfort occurs.

Eye Contact: Mechanical injury only. Flush eyes with water as a precaution. Get medical attention if irritation develops or persists.

Skin Contact: No first aid measures normally required. Wash exposed skin with mild soap and water. Individuals experiencing skin sensitivity should obtain medical advice.

Notes to physician: Treat according to symptoms.

5. FIRE-FIGHTING MEASURES

Flash Point: Not applicable

Auto-ignition temperature: 310°C - 410°C (590°F - 720°F)

Flammable limits: Non-volatile material

Fire extinguishing measures: Water spray, foam, or dry chemical using manufacturer's recommended application techniques.

Hazardous combustion products: Carbon dioxide, carbon monoxide, aldehydes, and small amounts of other organic vapors may be produced.

Unusual fire/explosion hazards: None

6. ACCIDENTAL RELEASE MEASURES

Spill: Not applicable

7. HANDLING AND STORAGE

Handling: No special requirements.

Storage: Product should be stored packed in the original box at normal environmental conditions (temperature range from 10°C to 30°C and relative humidity between 30 – 70%).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: Not applicable

Respiratory protection: Not required under normal use.

Eye protection: Not required under normal use.

Protective gloves / clothing: Gloves or other forms of skin protection should be worn by individuals who experience skin sensitivity.

Storage requirements: Store in a cool area away from ignition sources.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Solid

Odor: Rubber-like

Odor threshold: No data available

Specific gravity: 920 – 960 kg/m³ (57 – 60 lb/ft³)

Vapor pressure: Not applicable, non-volatile material

Vapor density: Not applicable, non-volatile material.

Evaporation rate: Not applicable, non-volatile material.

Boiling point: Not applicable, solid material.

Melting point: 105°C - 140°C (221°F - 284°F)

Ph: Not applicable, insoluble.

Solubility: Insoluble in both oil and water.

10. STABILITY AND REACTIVITY

Stability: Stable.

Incompatibility: None.

Hazardous decomposition products: At temperatures over 250°C (482°F) carbon monoxide, carbon dioxide, aldehydes, and small amounts of other organic vapors may be produced. Carbon monoxide formation is enhanced under conditions of oxygen starvation.

11. TOXICOLOGICAL INFORMATION

Effects of Acute and Chronic Exposure

Inhalation: Not likely to be a problem due to physical form; mechanical suffocation possible.

Ingestion: Should not be ingested under normal use.

Eyes: Possible mechanical injury.

Skin: Not generally suitable for skin application. Prolonged contact should be avoided, may cause redness and/or irritation.

Toxicity Data

Carcinogenicity: Not carcinogenic by inhalation or ingestion.

Reproductive effects: No reported effects.

Teratogenic effects: No reported effects.

Mutagenic effects: No reported effects.

Synergistic effects: No reported effects.

LD 50 / LC 50 Data: No test data available for routes of inhalation or ingestion.

12. ECOLOGICAL INFORMATION (non-mandatory)

Environmental effects: No known significant effects or critical hazards.

Aquatic ecotoxicity: Not available.

Biodegradability: Not available.

Other adverse effects: No known significant effects or critical hazards.

This product is not hazardous to the environment.

13. DISPOSAL CONSIDERATIONS (non-mandatory)

Waste disposal: Incinerate or bury in approved landfill site in accordance with federal, provincial, state, and municipal regulations. Be aware of combustion products which may be produced during incineration.

14. TRANSPORT INFORMATION (non-mandatory)

TDG Classification: Exempt, not regulated.

15. REGULATORY INFORMATION (non-mandatory)

Canada: WHMIS Classification: Exempt, not a controlled product.

United States: HCS Classification: Not regulated.

International Regulations

Canada Inventory (DSL): All components are listed or exempted.

United States Inventory (TSCS): All components are listed or exempted.

Europe Inventory (EINECS): All components are listed or exempted.

Australia Inventory (AICS): All components are listed or exempted.

China Inventory (IECSC): All components are listed or exempted.

Korea Inventory (ECL): All components are listed or exempted.

Philippines Inventory (PICCS): All components are listed or exempted.

16. OTHER INFORMATION

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SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.stop gu
Product Description: Hydrophilic elastic waterstop
Synonyms: N/A
CAS No: N/A

Supplier:
EPRO Services, Inc.
PO Box 347
Derby, KS 67037
800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

GHS classification

Flammable liquid: Not classified
Acute toxicity-oral: Not classifiable
Acute toxicity-dermal: Not classifiable
Acute toxicity-inhalation: Not classifiable
Skin irritation: Category 3
Eye damage/irritation: Not classifiable
Sensitization-respiratory: Category 1
Sensitization-respiratory skin: Category 1
Germ cell mutagenicity: Not classifiable
Carcinogenicity: Category 2
Toxic to reproduction: Category 1
Specific target organ systemic toxicology (single exposure): Category 1 (liver, kidney, central nerve)
Specific target organ systemic toxicology (repetitive exposure): Category 1 (nerve)
Aspiration hazard: Not classifiable
Hazardous to the aquatic environment-acute: Category 3
Hazardous to the aquatic environment-chronicity: Not classifiable

GSA Label element



Signal Word: Danger

Hazard and Toxicity Information

Causes mild skin irritation.

May cause allergy or asthma symptoms or breathing difficulties if inhaled.

May cause an allergic skin reaction.

Suspected of causing cancer.

May damage fertility or the unborn child.

May cause damage to organs.

May cause damage to organs through prolonged or repeated exposure.

Harmful to aquatic life.

Prevention

Do not handle until all safety precautions have been read and understood.

Keep away from heat/sparks/open flames/hot surfaces.

Avoid drinking or breathing.

Do not get in eyes, on skin, or on clothing.

Wear protective gloves/protective clothing/eye protection/face protections.

Wash hands and face thoroughly after handling.

Avoid release to the environment.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Classification of the substance or mixture: Mixture

Chemical/common name: No name

Components, ingredients, and CAS number:

Components	Content (%)	MITI no.	CAS no.	Remarks (PRTR)
Inorganic powder	33%			
Titanium dioxide	5%	(1)-558	13463-67-7	
Silica gel	2%	(1)-548	14808-60-7	
Ethylbenzene	2.1%	(3)-28	100-41-4	(Class 1) 53
Xylene	2.5%	(3)-3	1330-20-7	(Class 1) 80
Phthalate series plasticier	15%			
Polyurethane polymer	40%			

4. FIRST-AID MEASURES

If inhalation: Move to a place with fresh air. If you feel unwell, call a doctor/physician.

If on skin: Take off contaminated clothes, shoes, etc. and flush affected area of skin with large amount of water or lukewarm water and soap. If you feel unwell, call a doctor/physician.

If in eyes: Rinse with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. If irritation persists, get medical advice/attention.

If swallowed: Rinse mouth. Do not induce vomiting. Get medical advice/attention.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing agents: Dry powder, carbon dioxide, air foam fire extinguisher, water spray.

Unsuitable extinguishing agents: A stream of water.

Specific firefighting: Keep away from near ignition source. Extinguish from windward with protective equipment.

Protective equipment: Use respiratory protective device.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Use only non-sparking tools. Keep unprotected persons away.

Protective equipment and emergency procedures: Wear protective equipment.

Environmental precautions: Avoid release to the environment.

Methods and materials for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

7. HANDLING AND STORAGE

Handling:

Fire strict prohibition.

Use explosion-proof electrical/ventilating/lighting/equipment.

Wear protective gloves/protective clothing/eye protection/face protection. Use personal protective equipment as required.

Keep away from heat/sparks/open flames/hot surfaces.

Avoid contact with strongly oxidizing agent.

Wash hands thoroughly after handling.

Storage: Keep receptacle tightly sealed. Store in cool, dry conditions in well-sealed receptacles.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters: 50ppm (Xylene)

Allowable parameters

Japan society for occupational health: (2005) 50ppm (Xylene)

ACGIH: (2005) TLB-TWA 100ppm (Xylene)

Equipment measures: When steam or fume and mist occur, set up a local exhaust ventilation. Set up facilities for washing eyes and physical cleaning near handling locality.

Protective equipment

Respiratory protection: Gas mask (for organic gas), an airline respirator.

Hand protection: Protective gloves.

Eye protection: Tightly fitting safety goggles.

Skin/body protection: Impervious clothing.

Sanitary requirement: Wash thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Paste

pH: Not applicable

Boiling point: No data available

Evaporation rate: No data available

Vapor density: No data available

Solubility: Insoluble in water

Flammability (solid, gas): No data available

Odor: Xylene odor

Melting/freezing point: No data available

Flash point: 52°C

Vapor pressure: No data available

Specific gravity: 1.29 (20°C)

Auto-ignition temperature: No data available

10. STABILITY AND REACTIVITY

Stability and reactivity: Product is stable at normal temperature and ordinary pressure.

Possibility of hazardous reactions: This component is dangerous in response to a strongly oxidizing agent. This component can run not in response to active hydrogen workplace.

Conditions to avoid: Heating.

Incompatible materials: Oxidizing agent.

11. TOXICOLOGICAL INFORMATION

Acute toxicity-oral: Not classifiable

Acute toxicity-dermal: Not classifiable

Acute toxicity-inhalation: Not classifiable

Skin corrosion/irritation: Category 3

Eye damage/irritation: Not classifiable

Sensitization-respiratory: Category 1

Sensitization-respiratory skin: Category 1

Germ cell mutagenicity: Not classifiable

Carcinogenicity: Category 2

Toxic to reproduction: Category 1

Specific target organ systemic toxicology (single exposure): Category 1 (liver, kidney, central nerve)

Specific target organ systemic toxicology (repetitive exposure): Category 1 (nerve)

Aspiration hazard: Not classifiable

12. ECOLOGICAL INFORMATION (non-mandatory)

No information available.

13. DISPOSAL CONSIDERATIONS (non-mandatory)

Dispose of contents/container in accordance with local regulation for industrial waste disposal. Consign a qualified industrial waste disposer.

14. TRANSPORT INFORMATION (non-mandatory)

Prevent cargo from falling, damaging, or collapsing.

ERG number: 171

UN number: Not applicable

15. REGULATORY INFORMATION (non-mandatory)

In Japan

Industrial Safety and Health Act: Article 57-2 (Notifiable substances)

Xylene

Ethylbenzene

Titanium dioxide

Silica gel

4,4'-MDI

Poisonous and Deleterious Substances Control Act: Not applicable

Fire Service Act: Not applicable

Air Pollution Control Act: Not applicable

Pollutant Release and Transfer Register: Class 1 Designated Chemical Substances – Xylene, Ethylbenzene

16. OTHER INFORMATION

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SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.shield 110 (formerly ECOSHIELD-E10), e.shield 108 (formerly ECOSHIELD-E8), e.shield 115 (formerly ECOSHIELD-E15)

Product Description: Red film

Chemical Name: Polyethylene

Chemical Family: Ethylene-based Polymer

CAS No: N/A

Supplier:

EPRO Services, Inc.

PO Box 347

Derby, KS 67037

800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

NO HAZARDOUS INGREDIENTS.

CAUTION: Molten material will product thermal burns.

<u>HMIS* Hazard</u>	<u>Rating</u>
Health	0
Flammability	1
Chemical Reactivity	0

HMIS* Rating involves data interpretations that may vary from company to company. They are only intended for rapid, general identification of the magnitude of the specific hazard. To deal properly with the safe handling of this material, all the information contained in this SDS must be considered.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Typical composition:

<u>Weight %</u>	<u>Component</u>	<u>CAS #</u>
>0 – 95%	Polyethylene	9002-88-4
0 - < 95%	Linear low density polyethylene	25213-02-9
< 10%	Modifiers / Additives	Proprietary

4. FIRST-AID MEASURES

Inhalation: In case of adverse exposure to vapors and/or aerosols formed at elevated temperatures, remove affected victim from exposure.

Eyes: Product is an inert solid. If product is in the eye, remove immediately.

Skin: If exposed to hot product, immediately immerse in or flush with large amounts of cold water to dissipate heat.

Ingestion: First aid is normally not required. Material is not expected to be absorbed from the gastrointestinal tract. Induction of vomiting should not be necessary.

Note to physicians: Burns should be treated as thermal burns. Cover with clean cotton sheeting or gauze. Do not attempt to remove material from skin or to remove contaminated clothing as the damaged flesh can be easily torn.

5. FIRE-FIGHTING MEASURES

Extinguishing Media: Water spray or dry chemical

Special Fire Fighting Procedures: Use self-contained breathing apparatus and protective clothing

Hazard combustion products: Carbon dioxide, carbon monoxide

Unusual Fire and Explosion Hazards: Powdered material may form explosive dust-air mixtures.

6. ACCIDENTAL RELEASE MEASURES

Spill is not applicable. Material is normally in solid form.

7. HANDLING AND STORAGE

Electrostatic accumulation: Yes, use proper bonding and/or grounding

Storage temperature: Ambient

Loading / Unloading temperature: Ambient

Storage / Transport pressure: Atmospheric

Loading / Unloading viscosity: Solid

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Controls: Not applicable

Personal Protection: At ambient temperature, wear safety glasses when contact is likely. When contact may occur with hot material, wear thermal resistant gloves, arm protection, and a face shield.

Workplace Exposure Guidelines: OSHA Regulations 29 CFR 1910.1000 requires the permissible exposure limits of 5 mg/m³ (respirable dust), and 1.5 mg/m³ (total dust) based on the OSHA PEL for nuisance dust.

The recommended permissible exposure levels indicated above reflect the levels revised by OSHA in 1989 or in subsequent regulatory activity. Although the 1989 levels have since been vacated by the 11th Circuit Court of Appeals, it is recommended that the lower exposure levels be observed as reasonable protection of workers.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form: Solid
Color: Red
Specific Gravity: < 1.0
Flash Point: Not applicable

Odor: Odorless
Solubility in Water: Insoluble
Softening Point: < 130°C
Melting Point: 245 - 256°F

10. STABILITY AND REACTIVITY

Stability: Stable
Conditions to avoid: Temperatures > 650°F (343°C)
Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

Route(s) of Entry: Inhalation: No Skin: No Ingestion: No
Health Hazards (Acute & Chronic): No health hazards under normal processing conditions.
Eye & Skin Contact: None Identified.
Skin Absorption: Non-toxic.
Inhalation: No significant irritation expected.
Ingestion: No significant health hazards identified.
Carcinogenicity: Unrelated NTP: No IARC: No OSHA Regulated: No

12. ECOLOGICAL INFORMATION

There is no specific ecological data available regarding this product.

13. DISPOSAL CONSIDERATIONS

Dispose of according to State and Local regulations.
Material is non-toxic and non-flammable and can be disposed of in land fill sites.

14. TRANSPORT INFORMATION

No hazardous ingredients.

15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the controlled products.

Sara 313 Information: Product contains no chemical subject to Sara Title III Section 313 Supplier Notification Requirements.

Sara Hazard Category: Product has been reviewed in accordance with EPA Hazard Categories (Sara Title III) and is considered, under applicable conditions to meet the following categories: Not to have met any hazard category.

Toxic Substances Control Act (TSCA): All necessary ingredients are on the TSCA inventory.

State Right-to-Know: This product is not known to contain any substances subject to disclosure requirements of New Jersey, Pennsylvania, and California.

OSHA Hazard Communication Standard: Product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

16. OTHER INFORMATION

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SAFETY DATA SHEET

According to OSHA HCS

1. PRODUCT IDENTIFICATION

Trade Name(s): e.stop b (formerly EPROSTOP-BP)

Product Description: Sealant

Supplier:

EPRO Services, Inc.

PO Box 347

Derby, KS 67037

800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

Classification of the substance or mixture: The product does not meet the criteria for classification a hazardous under the GHS and 29 CFR 1910.1200.

Label elements

GHS label elements: Void

Hazard pictograms: Void

Hazard pictograms: Void

Signal word: Void

Hazard statements: Void

Classification system

NFPA ratings (scale 0 – 4)

Health = 1

Fire = 1

Reactivity = 0

HMIS-ratings (scale 0 – 4)

Health = 1

Fire = 1

Physical Hazard = 0

Other hazards – Results of PBT and vPvB assessment

PBT: Not applicable

vPvB: Not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical characterization: Mixtures

Description: Mixture

· Hazardous		
471-34-1	calcium carbonate	2,5-10%
14808-60-7	Quartz (SiO ₂)	≤2.5%
546-93-0	Magnesite	≤1.0%
1333-86-4	Carbon black	≤0.5%

Additional information: All concentrations are in percent by weight unless the ingredient is a gas. Gas concentrations are in percent by volume. Any pigments or fillers in this product which may be considered "Hazardous" are potentially hazardous only if inhaled as an airborne dust. Exposure by these ingredients as used in sealants, putties, bedding compounds and non-sprayable products is highly unlikely. For the wording of the listed risk phrases refer to section 15.

4. FIRST-AID MEASURES

General information: No special measures required.

After inhalation: Overexposure, remove to fresh air and seek medical attention.

After skin contact: Wipe excess from skin. Immediately wash with water and soap and rinse thoroughly.

After eye contact: Rinse opened eye for 20 minutes under running water. If eye becomes irritated, obtain medical treatment.

After swallowing: Seek medical treatment.

Information for doctor: Most important symptoms and effects, both acute and delayed No further relevant information available.

Indication of any immediate medical attention and special treatment needed: No further relevant information available.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing agents: CO₂, extinguishing powder, or water spray. Fight larger fires with water spray.

Special hazards arising from the substance or mixture: No further relevant information available.

Advice for firefighters: Protective equipment: Protective clothing and respiratory protective device.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures: Ensure adequate ventilation

Environmental precautions: No special measures required.

Methods and material for containment and cleaning up: Dispose of contaminated material as waste in accordance with federal state and local regulations.

7. HANDLING AND STORAGE

Precautions for safe handling: No special measures required.

Information about protection against explosions and fires: Keep container closed when not in use.

Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility: Keep away from open flames and high temperatures.

Further information about storage conditions: None.

Specific end use(s): No further relevant information available.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Components with limit values that require monitoring at the workplace:	
471-34-1 calcium carbonate	
PEL	Long-term value: 15* 5** mg/m ³ *total dust **respirable fraction
REL	Long-term value: 10* 5** mg/m ³ *total dust **respirable fraction
TLV	TLV withdrawn
546-93-0 Magnesite	
PEL	Long-term value: 15* 5** mg/m ³ *total dust **respirable fraction
REL	Long-term value: 10* 5** mg/m ³ *total dust **respirable fraction
TLV	TLV withdrawn

The lists that were valid during the creation were used as basis.

Exposure controls

Personal protective equipment: (see listings below)

General protective and hygienic measures: The usual precautionary measures for handling chemicals should be followed.

Breathing equipment: Not required.

Protection of hands: The glove material must be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation. The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material cannot be calculated in advance and has therefore to be checked prior to the application. Penetration time of glove material: The exact break through time must be found out by the manufacturer of the protective gloves and must be observed.

Eye protection: Safety glasses with side shields.

Body protection: Protective work clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form: Solid
Color: Black
Odor: Slight earthy
Odor threshold: Not determined
pH-value: Not applicable
Melting point: Undetermined
Boiling point: Undetermined
Flash point: 293° C (559° F)
Flammability (solid, gaseous): Not determined
Decomposition temperature: Not determined
Auto igniting: Product is not self-igniting
Danger of explosion: Product does not present an explosion hazard
Flammable limits: Lower: Not determined Upper: Not determined
Vapor pressure: Not applicable
Specific gravity at 23°C (73°F): 1.6 g/cm³ (13.352 lbs/gal)
Relative density: Not determined
Vapor density: Not applicable
Evaporation rate: Not determined
Solubility in / Miscibility with Water: Insoluble
Partition coefficient (n-octanol/water): Not determined
Viscosity – Dynamic: Not applicable
Viscosity – Kinematic: >20.5 cSt
Organic solvents: 0.0%
Solids content: 100.0%

10. STABILITY AND REACTIVITY

Reactivity: No further relevant information available.

Chemical stability

Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.

Possibility of hazardous reactions: No dangerous reactions known.

Conditions to avoid: Heat, flames, sparks.

Incompatible materials: Reacts with strong oxidizing agents.

Hazardous decomposition products: No dangerous decomposition products know.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Primary irritant effect on the skin: Generally this product does not irritate the skin.

Primary irritant effect on the eye: Generally this product does not irritate the eye.

Sensitization: No sensitizing effects known.

Additional information: The product is not subject to classification according to internally approved calculation methods for preparations. When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

Carcinogenic categories

IARC (International Agency for Research on Cancer)		
14808-60-7	Quartz (SiO ₂)	1
1333-86-4	Carbon black	2B
NTP (National Toxicology Program)		
14808-60-7	Quartz (SiO ₂)	K
OSHA-Ca (Occupational Safety & Health Administration)		
None of the ingredients is listed.		

12. ECOLOGICAL INFORMATION

Toxicity

Aquatic toxicity: Not expected to be harmful to aquatic organisms

Persistence and degradability: No further relevant information available.

Behavior in environmental systems:

Bioaccumulative potential: No further relevant information available.

Mobility in soil: No further relevant information available.

Additional ecological information

General notes: At present there are no ecotoxicological assessments.

Generally not hazardous for water

Results of PB T and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

Other adverse effects: No further relevant information available.

13. DISPOSAL CONSIDERATIONS

Dispose of according the state and local regulations.

14. TRANSPORT INFORMATION

UN-Number: DOT, ADR, AND, IMDG, IATA: Not regulated

UN proper shipping name: DOT, ADR, AND, IMDG, IATA: Not regulated

Transport hazard classes: DOT, ADR, AND, IMDG, IATA: Not regulated

Packing group: DOT, ADR, IMDG, IATA: Not regulated

Environmental hazards: Not applicable

Special precautions for user: Not applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

US "Model Regulation": Not regulated

15. REGULATORY INFORMATION

Section 355 (extremely hazardous substances): None of the ingredients is listed.

Section 313 (Specific toxic chemical listings): None of the ingredients is listed.

TSCA (Toxic Substances Control Act): All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements.

(DSL) Canada Domestic Substance List: All components of this product are on the DSL or are exempt from DSL requirements.

New Jersey Right-to Know List: None of the ingredients is listed.

New Jersey Special Hazardous Substance List: None of the ingredients is listed.

Pennsylvania Right-to Know List: None of the ingredients is listed.

Pennsylvania Special Hazardous Substance List: None of the ingredients is listed.

California Proposition 65

Chemicals known to cause cancer: 1333-86-4 Carbon Black

Chemicals known to cause reproductive toxicity: None of the ingredients is listed.

Chemicals known to cause developmental toxicity: None of the ingredients is listed.

Carcinogenicity categories

EPA (Environmental Protection Agency): None of the ingredients is listed.

TLV (Threshold Limit Value established by ACGIH): 14808-60-7 Quartz (SiO₂) 1333-86-4 Carbon black

MAK (German Maximum Workplace Concentration): 14808-60-7 Quartz (SiO₂) 1333-86-4 Carbon black

NIOSH-Ca (National Institute for Occupational Safety & Health): 14808-60-7 Quartz (SiO₂) 1333-86-4 Carbon black

National regulations

Water hazard class: Generally not hazardous for water.

Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16. OTHER INFORMATION

Abbreviations and acronyms

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International

Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation

IATA: International Air Transport Association

ACGIH: American Conference of Governmental Industrial Hygienists EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA) HMIS: Hazardous Materials Identification System (USA) PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

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SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.term hd (formerly Term Bar-HD)

Synonyms: N/A

CAS No: N/A

Supplier:

EPRO Services, Inc.

PO Box 347

Derby, KS 67037

800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

No hazardous ingredients.

THIS PRODUCT IS SUPPLIED IN COMPLIANCE WITH THE TSCA REPORTING REQUIREMENTS

3. COMPOSITION/INFORMATION ON INGREDIENTS

PVC

4. FIRST-AID MEASURES

Eye Contamination: (dust/fragment) Flush with large amounts of water for 20 minutes lifting upper and lower lids occasionally. Get medical attention.

Skin contact: Thoroughly wash exposed area with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse.

Inhalation: If overexposure occurs, remove individual to fresh air. If breathing stops, administer artificial respiration. Get medical attention.

Ingestion: If a large amount of material is swallowed **DO NOT INDUCE VOMITING**. If vomiting begins lower victim's head in an effort to prevent vomit from entering lungs and get medical attention.

5. FIRE-FIGHTING MEASURES

Flash Point: N/A

Flammable limits %: Lower N/A Upper N/A

Extinguishing Media: Foam, CO², Dry chemical, water fog

Special Fire Fighting Procedures: Use self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: SEE REACTIVITY DATA.

6. ACCIDENTAL RELEASE MEASURES

Not applicable. Material is normally in solid form.

7. HANDLING AND STORAGE

Store in a clean, dry area and keep material covered.

Respiratory Protection: Not required under normal process conditions.

Ventilation: Not required

Protective Gloves: Not required.

Eye Protection: Not required.

Other Protective clothing or equipment: Not required.

Work/Hygienic Practices: Wash hands after handling and before eating.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

No protective measures are required under normal process conditions.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Grey in color, no odor

Specific Gravity: N/A

Vapor Pressure (mm Hg): N/A

Vapor Density (Air = 1): N/A

Evaporation Rate: (Butyl Acetate - 1): N/A

Auto Ignition Temperature: N/A

Solubility in Water: N/A

Percent Volatiles: None

Boiling Point: Degrees: N/A

Melting Point: NA

10. STABILITY AND REACTIVITY

Stability: Stable

Conditions to avoid: Keep Away from ignition sources (e.g. heat, sparks and open flames).

Incompatibility (materials to avoid): Strong Oxidizing Agents, Acids and bases.

Hazardous Decomposition or Byproducts: Carbon Monoxide, Carbon Dioxide and Hydrocarbons can be generated during thermal decomposition and combustion.

Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

NO HAZARDOUS MATERIALS

12. ECOLOGICAL INFORMATION (non-mandatory)

13. DISPOSAL CONSIDERATIONS

Dispose of according to State and Local regulations.

Material is non-toxic and non-flammable and can be disposed of in land fill sites.

14. TRANSPORT INFORMATION

CONTAINS NO HAZARDOUS INGREDIENTS

15. REGULATORY INFORMATION (non-mandatory)

16. OTHER INFORMATION

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SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.shield 110 (formerly ECOSHIELD-E10), e.shield 108 (formerly ECOSHIELD-E8), e.shield 115 (formerly ECOSHIELD-E15)

Product Description: Red film

Chemical Name: Polyethylene

Chemical Family: Ethylene-based Polymer

CAS No: N/A

Supplier:

EPRO Services, Inc.

PO Box 347

Derby, KS 67037

800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

NO HAZARDOUS INGREDIENTS.

CAUTION: Molten material will product thermal burns.

<u>HMIS* Hazard</u>	<u>Rating</u>
Health	0
Flammability	1
Chemical Reactivity	0

HMIS* Rating involves data interpretations that may vary from company to company. They are only intended for rapid, general identification of the magnitude of the specific hazard. To deal properly with the safe handling of this material, all the information contained in this SDS must be considered.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Typical composition:

<u>Weight %</u>	<u>Component</u>	<u>CAS #</u>
>0 – 95%	Polyethylene	9002-88-4
0 - < 95%	Linear low density polyethylene	25213-02-9
< 10%	Modifiers / Additives	Proprietary

4. FIRST-AID MEASURES

Inhalation: In case of adverse exposure to vapors and/or aerosols formed at elevated temperatures, remove affected victim from exposure.

Eyes: Product is an inert solid. If product is in the eye, remove immediately.

Skin: If exposed to hot product, immediately immerse in or flush with large amounts of cold water to dissipate heat.

Ingestion: First aid is normally not required. Material is not expected to be absorbed from the gastrointestinal tract. Induction of vomiting should not be necessary.

Note to physicians: Burns should be treated as thermal burns. Cover with clean cotton sheeting or gauze. Do not attempt to remove material from skin or to remove contaminated clothing as the damaged flesh can be easily torn.

5. FIRE-FIGHTING MEASURES

Extinguishing Media: Water spray or dry chemical

Special Fire Fighting Procedures: Use self-contained breathing apparatus and protective clothing

Hazard combustion products: Carbon dioxide, carbon monoxide

Unusual Fire and Explosion Hazards: Powdered material may form explosive dust-air mixtures.

6. ACCIDENTAL RELEASE MEASURES

Spill is not applicable. Material is normally in solid form.

7. HANDLING AND STORAGE

Electrostatic accumulation: Yes, use proper bonding and/or grounding

Storage temperature: Ambient

Loading / Unloading temperature: Ambient

Storage / Transport pressure: Atmospheric

Loading / Unloading viscosity: Solid

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Controls: Not applicable

Personal Protection: At ambient temperature, wear safety glasses when contact is likely. When contact may occur with hot material, wear thermal resistant gloves, arm protection, and a face shield.

Workplace Exposure Guidelines: OSHA Regulations 29 CFR 1910.1000 requires the permissible exposure limits of 5 mg/m³ (respirable dust), and 1.5 mg/m³ (total dust) based on the OSHA PEL for nuisance dust.

The recommended permissible exposure levels indicated above reflect the levels revised by OSHA in 1989 or in subsequent regulatory activity. Although the 1989 levels have since been vacated by the 11th Circuit Court of Appeals, it is recommended that the lower exposure levels be observed as reasonable protection of workers.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form: Solid
Color: Red
Specific Gravity: < 1.0
Flash Point: Not applicable

Odor: Odorless
Solubility in Water: Insoluble
Softening Point: < 130°C
Melting Point: 245 - 256°F

10. STABILITY AND REACTIVITY

Stability: Stable
Conditions to avoid: Temperatures > 650°F (343°C)
Hazardous Polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

Route(s) of Entry: Inhalation: No Skin: No Ingestion: No
Health Hazards (Acute & Chronic): No health hazards under normal processing conditions.
Eye & Skin Contact: None Identified.
Skin Absorption: Non-toxic.
Inhalation: No significant irritation expected.
Ingestion: No significant health hazards identified.
Carcinogenicity: Unrelated NTP: No IARC: No OSHA Regulated: No

12. ECOLOGICAL INFORMATION

There is no specific ecological data available regarding this product.

13. DISPOSAL CONSIDERATIONS

Dispose of according to State and Local regulations.
Material is non-toxic and non-flammable and can be disposed of in land fill sites.

14. TRANSPORT INFORMATION

No hazardous ingredients.

15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the controlled products.

Sara 313 Information: Product contains no chemical subject to Sara Title III Section 313 Supplier Notification Requirements.

Sara Hazard Category: Product has been reviewed in accordance with EPA Hazard Categories (Sara Title III) and is considered, under applicable conditions to meet the following categories: Not to have met any hazard category.

Toxic Substances Control Act (TSCA): All necessary ingredients are on the TSCA inventory.

State Right-to-Know: This product is not known to contain any substances subject to disclosure requirements of New Jersey, Pennsylvania, and California.

OSHA Hazard Communication Standard: Product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

16. OTHER INFORMATION

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SAFETY DATA SHEET

According to Regulation (EC) No 1907/2006 (REACH)

1. PRODUCT IDENTIFICATION

Trade Name(s): e.adhesive
Product Description: Waterborne acrylic coating
Synonyms: N/A
CAS No: N/A

Supplier:
EPRO Services, Inc.
PO Box 347
Derby, KS 67037
800-882-1896 (8:00am – 5:00pm CST)

2. HAZARD(S) IDENTIFICATION

Physical hazards: Not classified.
Health hazards: Skin corrosion/irritation (Category 2); Serious eye damage/eye irritation (Category 2B);
Carcinogenicity (Category 2)
Environmental hazards: Not classified.
OSHA defined hazards: Not classified.
Hazard statement: Suspected of causing cancer. Causes eye irritation. Causes skin irritation.

Precautionary statement

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection. Wash hands thoroughly after handling.

Response: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower. IF exposed or concerned: Get medical advice/attention. If skin irritation occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash before reuse.

Storage: Store locked up.

Disposal: Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazards not otherwise classified (HNOC): None known.

Supplemental Information: Not applicable.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixtures:

<u>Chemical Name</u>	<u>CAS Number</u>	<u>%</u>
Vinyl Acetate	108-05-4	<0.5
Other components below reportable levels		99.5

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. FIRST-AID MEASURES

Inhalation: Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact: Wash off with soap and water. Get medical attention if irritation develops and persists.

Eye contact: Rinse with water. Get medical attention if irritation develops and persists.

Ingestion: Rinse mouth. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed: Direct contact with eyes may cause temporary irritation.

Indication of immediate medical attention and special treatment needed: Treat symptomatically.

General information: Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media: Water fog. Foam. Dry chemical powder. Carbon dioxide (CO₂).

Unsuitable extinguishing media: Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical: During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters: Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Firefighting equipment/instructions: Move containers from fire area if you can do so with risk.

Specific methods: Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards: No unusual fire or explosion hazards noted.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Keep unnecessary personnel away. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up:

Large spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.

Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use.

Environmental precautions: Avoid discharge into drains, water courses or onto the ground.

7. HANDLING AND STORAGE

Precautions for safe handling: Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities: Keep container tightly closed in a cool, well-ventilated place. Protect from freezing. Store between 5°C (41°F) and 38°C (100°F). Use care in handling/storage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure limits: This mixture has no ingredients that have PEL, TLV, or other recommended exposure limit.

Biological limit values: No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls: Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded.

Individual protection measures, such as personal protective equipment

Eye/face protection: Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection: Hand protection: Rubber gloves are recommended. Other: Wear appropriate thermal protective clothing when necessary.

Respiratory protection: In case of insufficient ventilation, wear suitable respiratory equipment.

Thermal hazards: Wear appropriate thermal protective clothing when necessary.

General hygiene considerations: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Milky

Color: Red

pH: 4 – 6

Melting point/freezing point: 32°F (0°C)

Flash point: >300.0°F (>148.9°C)

Flammability (solid, gas): Not available

Flammability limit-upper (%): Not available

Explosive limit-upper (%): Not available

Vapor density: Not available

Solubility (water): Not available

Auto-ignition temperature: Not available

Decomposition temperature: Not available

Density: 8.00 – 9.20 lb/gal

Physical state/Form: Liquid

Odor: Slight odor

Odor threshold: Not available

Initial boiling point: 212°F (100°C)

Evaporation rate: Not available

Flammability limit-lower (%): Not available

Explosive limit-lower (%): Not available

Vapor pressure: Not available

Relative density: Not available

Partition coefficient (n-octanol/water): Not available

Decomposition temperature: Not available

Viscosity: Not available

Specific gravity: 1.02

10. STABILITY AND REACTIVITY

Reactivity: The product is stable and non-reactive under normal conditions of use, storage and transport.

Chemical stability: Material is stable under normal conditions.

Possibility of hazardous reactions: No dangerous reaction known under conditions of normal use.

Conditions to avoid: Contact with incompatible materials.

Incompatible materials: Strong oxidizing agents.

Hazardous decomposition products: No hazardous decomposition products are known.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation: Prolonged inhalation may be harmful. However, this product does not currently meet the criteria for classification.

Skin contact: Irritating to skin.

Eye contact: Direct contact with eyes may cause temporary irritation.

Ingestion: Expected to be a low ingestion hazard.

Symptoms related to the physical, chemical and toxicological characteristics: Direct contact with eyes may cause temporary irritation.

Information on toxicological effects

Acute toxicity: Not available

Skin corrosion/irritation: Causes mild skin irritation

Serious eye damage/eye irritation: Causes eye irritation

Respiratory or skin sensitization

Respiratory sensitization: Not available

Skin sensitization: This product is not expected to cause skin sensitization.

Germ cell mutagenicity: No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity: Suspected of causing cancer.

IARC Monographs. Overall Evaluation of Carcinogenicity: Not listed

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052): Not regulated

US. National Toxicology Program (NTP) Report on Carcinogens: Not listed

Reproductive toxicity: This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity – single exposure: Not classified

Specific target organ toxicity – repeated exposure: Not classified

Aspiration hazard: Not available

12. ECOLOGICAL INFORMATION (non-mandatory)

Ecotoxicity: The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence and degradability: No data is available on the degradability of this product.

Bioaccumulative potential: No data available.

Mobility in soil: No data available.

Other adverse effects: No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. DISPOSAL CONSIDERATIONS (non-mandatory)

Disposal instructions: Collect and reclaim or dispose in sealed containers at licensed waste disposal site.

Local disposal regulations: Dispose in accordance with all applicable regulations.

Hazardous waste code: The waste code should be assigned in discussion between the user, the producer, and the waste disposal company.

Waste from residues / unused products: Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instruction).

Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. TRANSPORT INFORMATION (non-mandatory)

DOT: Not regulated as dangerous goods.

IATA: Not regulated as dangerous goods.

IMDG: Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not available.

15. REGULATORY INFORMATION (non-mandatory)

US federal regulations: All components are on the U>S> EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D): Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4): Not listed.

SARA 304 Emergency release notification: Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052): Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance: Not listed.

Classified hazard categories: Skin corrosion or irritation. Serious eye damage or eye irritation.
Carcinogenicity.

SARA 303 (TRI reporting): Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List: Not regulated.

Clean Air Act (CAA) Section 112® Accidental Release Prevention (40 CFR 68.130): Not regulated.

Safe Drinking Water Act (SDWA): Not regulated.

US state regulations

California Proposition 65: California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

Country(s) or region	Inventory name	On Inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	No
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	No
US & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	No

*A "yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s). A "no" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. OTHER INFORMATION

NFPA ratings: Health: 1
Flammability: 1
Instability: 0

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E.PROTECT HYDROSTATIC WATERPROOFING AND VAPOR INTRUSION MITIGATION SPECIFICATION

SECTION 02 56 16 – GAS CONTAINMENT

SECTION 02 56 19.13 – FLUID-APPLIED GAS BARRIER

SECTION 07 14 16 – COLD FLUID-APPLIED WATERPROOFING

SECTION 07 17 16 – BENTONITE COMPOSITE SHEET WATERPROOFING

Part 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. The installation of materials designed to provide below grade waterproofing and vapor intrusion protection when installed per project specification, this section covers the waterproofing and vapor intrusion membrane, along with the following:
 - 1. Surface preparation and substrate treatment
 - 2. Auxiliary materials
 - 3. Prefabricated drainage mat
 - 4. Foundation drain

1.3 RELATED SECTIONS

- A. Section 02 24 00: Environmental Assessment
- B. Section 02 32 00: Geotechnical Investigation
- C. Section 03 15 00: Concrete Accessories
- D. Section 03 30 00: Cast-in-Place Concrete
- E. Section 03 40 00: Precast Concrete
- F. Section 07 90 00: Joint Protection
- G. Section 31 30 00: Earthwork Methods
- H. Section 33 41 00: Subdrainage

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide a waterproofing system that prevents the passage of water under hydrostatic conditions, methane gas, contaminant vapor, and complies with the physical requirements as demonstrated by testing performed by an independent testing agency.

1.5 SUBMITTALS

- A. Product Data: For each type of waterproofing specified submit manufacturer's printed technical data, tested physical and performance properties, instructions for evaluating, preparing, and treating substrates, and installation instructions.
- B. Shop Drawings: Project specific drawings showing locations and extent of waterproofing, details for substrate joints and cracks, sheet flashing, penetrations, transitions, and termination conditions.
- C. Samples: Submit two standard size samples of the of the following:
 - 1. Individual components of the specified composite membrane system.
- D. Applicator Certification: Submit written confirmation at the time of bid that applicator is currently approved by the membrane manufacturer.

1.6 QUALITY ASSURANCE

- A. Applicator Qualifications: Waterproofing applicator shall be an EPRO Authorized Applicator who is trained and performs work that in accordance with EPRO standards and policies. For project requiring a no-dollar-limit labor and material warranty, the waterproofing applicator must be E.Assurance Certified at the time of bid.
- B. Third Party Inspection: Independent inspection of the composite system installation may be required based on project conditions and desired warranty coverage. Inspection reports shall be submitted directly to the composite waterproofing manufacturer and made available to other parties per the owners' direction. For projects requiring a no-dollar-limit labor and material warranty, an independent inspector must be E.Assurance Certified and comply with the documentation requirements.
- C. Water Sample: A 2-liter representative ground water sample shall be sent by the installation contractor to the manufacturer if contaminated groundwater and/or salt water has been discovered on the site. Email Watersample@eproinc.com to receive shipping instructions.
- D. Pre-Construction Meeting: A meeting shall be held prior to application of the waterproofing system to assure proper substrate preparation, confirm installation conditions, and any additional project specific requirements. Attendees of the meeting shall include, but are not limited to the following:
 - 1. EPRO representative
 - 2. EPRO certified applicator
 - 3. Third party inspector
 - 4. General contractor
 - 5. Owners representative
 - 6. Concrete/Shotcrete contractor
 - 7. Rebar contractor
 - 8. Project design team
 - 9. All appropriate related trades
- E. Field Sample: Apply waterproofing system field sample to 100 ft² (9.3 m²) of each assembly to demonstrate proper application techniques and standard of workmanship.

1. Notify composite membrane system manufacturer representative, architect, certified inspector, and other appropriate parties one week in advance of the dates and times when field sample will be prepared.
2. If architect and certified inspector determine that field sample does not meet requirements; reapply composite membrane system until field sample is approved.
3. Retain and maintain approved field sample during construction in an undisturbed condition as a standard for judging the completed composite membrane system. An undamaged field sample may become part of the completed work.

F. Materials: Composite membrane system and auxiliary materials shall be single sourced.

1.7 MATERIAL DELIVERY, STORAGE AND DISPOSAL

- A. Delivery: Deliver materials to site labeled with manufacturer's name, product brand name, material type, and date of manufacture. Upon the arrival of materials to the jobsite, inspect materials to confirm material has not been damaged during transit.
- B. Storage: Proper storage of onsite materials is the responsibility of the certified applicator. Consult product data sheets to confirm storage requirements. Storage area shall be clean, dry, and protected from the elements. If ambient air temperatures are expected to fall below 40°F, precautions will need to be taken to protect any polymer modified asphalt product from near freezing temperatures. Protect stored materials from direct sunlight.
- C. Disposal: Remove and replace any material that cannot be properly applied in accordance with local regulations and specification section 01 74 19.

1.8 PROJECT CONDITIONS

- A. Substrate Review: Substrates shall be reviewed by the certified applicator and accepted by the certified inspector prior to application. Application without signoff from certified inspector will likely result in voidance of warranty.
- B. Penetrations: All plumbing, electrical, mechanical, and structural items to be passing through the composite membrane system shall be properly spaced, positively secured in their proper positions, and appropriately protected prior to system application and throughout the construction phase. Braided grounding rods are not allowed to pass through the membrane in waterproofing applications.
- C. Reinforcement Steel: Composite membrane system shall be installed before placement of reinforcing steel. Any anchor bolts, or other methods, of securing reinforcement steel must be in place prior to the application of the polymer modified asphalt. Piano wire, shotcrete wire rods, or similar methodologies, are prohibited from penetrating the system post installation.
- D. Clearance: Minimum clearance of 24 inches is required for application of spray applied polymer modified asphalt, **e.spray**. For areas with less than 24-inch clearance, the **e.spray** membrane may be applied by hand using **e.roll**.
- E. Overspray: Protect all adjacent areas not receiving **e.spray** or **e.roll**. Masking is necessary to prevent unwanted overspray from adhering to, or staining, areas not receiving the membrane. Once **e.spray** or **e.roll** adheres to a surface it is extremely difficult to remove.

F. Weather Limitations: Perform work only when existing and forecast weather conditions are within manufacturer's recommendations.

1. Spray Applied Polymer Modified Asphalt Membrane: Minimum ambient temperature must be 40°F (7°C) and rising. For applications temperatures below 38 degrees, but greater than +19°F/-7°C, special equipment and material handling is needed. Substrate shall be clean and free from standing moisture.
2. EPRO applicators reserve the right not to install product when application conditions might be within manufactures acceptance, but ambient conditions may limit a successful application.
3. Bentonite: Application of bentonite materials to damp surfaces is acceptable provided it is being installed over **e.spray**.

1.9 WARRANTY

- A. General Warranty: The special warranty specified in this section shall not deprive the owner of other rights the owner may have under other provisions of the contract documents, and shall be in addition to, and run concurrent with, other warranties made by the contractor under requirements of the contract documents.
- B. Special Warranty: Submit a written warranty signed by waterproofing manufacturer agreeing to replace system materials that do not conform with manufactures published specifications, or are deemed to be defective. Warranty does not include failure of waterproofing due to failure of soil substrate prepared and treated according to requirements or formation of new joints and cracks in the specially applied concrete that exceed 1/8 inch (3.175 mm) in width.
 1. Warranty Period: 5 years after date of substantial completion. Longer warranty periods are available upon request.
 2. Coverage: Manufacturer will guarantee that the material provided is free of defects for the warranty period.
- C. Additional Warranty Options: Upgraded warranties are available by contacting the manufacturer. These warranties may have additional requirements and approval must be granted in accordance to the manufacturer's warranty requirements. Additional warranty options include:
 1. Standard Labor and Material (E.Series L&M): Manufacturer will provide non-prorated coverage for the warranty term, agreeing to repair or replace material that does not meet requirements or remain watertight.
 2. No-Dollar-Limit Labor and Material Warranty (E.Assurance ND): Manufacturer will provide a non-prorated, no-dollar-limit, coverage for the warranty term, agreeing to repair or replace material that does not meet requirements or remain watertight.

Part 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: EPRO Services, Inc. (EPRO), P.O. Box 347; Derby, KS 67037; Tel: (800) 882-1896; Email: Info@eproinc.com; Web: www.eproinc.com
- B. Underslab: E.Protect Underslab (178 mils) – **e.base 205**, **e.spray** (80 mils), **e.base 205b**
- C. Shoring Walls: E.Protect Shoring (178 mils) – **e.drain 12ds**, **e.drain 6000**, **e.base 205b**, **e.spray** (80 mils), **e.shield 205b**, **e.shield bb**
- D. Cast-in-Place Walls: E.Protect Wall (95 mils) – **e.spray** (80 mils), **e.shield 115**, **e.drain 6000**

2.2 SYSTEM PHYSICAL PROPERTIES

- A. The physical properties listed in this section reflect testing on the entire composite system. Physical properties of the individual system composite can be found in Specification Section 2.3.
 - 1. **E.Protect Underslab** assembly blends the characteristics of E.Protect+ and E.Proformance. The base course consists of **e.base 205** (an HDPE membrane thermally bonded to a geotextile fabric), an 80 mil layer of **e.spray** (polymer modified asphaltic membrane), and **e.shield 205b** (an HDPE reinforced bentonite sheet). E.Protect is appropriate for underslab waterproofing protection, but where site conditions or budget considerations might not require maximum protection.

Part 2 -

PROPERTIES	TEST METHOD	VALUE
Tensile Strength	ASTM D412	462.9 psi
Elongation	ASTM D412	735%
Adhesion to Concrete	ASTM D903	8 lbf/in
Puncture Resistance	ASTM D1709	447.1 lbf
Hydrostatic Head Resistance	ASTM D5385	100 psi (231 ft)
Water Vapor Transmission	ASTM E96	.033 perms
TCE Diffusion Rate		7.1×10^{-19} m ² /sec
Benzene Diffusion Rate		7.1×10^{-19} m ² /sec

Part 3 -

- 2. **E.Protect Shoring** assembly utilizes **e.base 205** (geotextile reinforced HDPE sheet membrane), a 80 mil layer of **e.spray** (polymer modified asphaltic membrane), and **e.shield 205b** (an HDPE reinforced bentonite sheet). Ideal for excavations greater than 20 feet, post tension foundations, and shoring walls with less than ideal substrates.

Part 4 -

PROPERTIES	TEST METHOD	VALUE
Tensile Strength	ASTM D412	462.9 psi
Elongation	ASTM D412	735%
Adhesion to Concrete	ASTM D903	8 lbf/in
Puncture Resistance	ASTM D1709	447.1 lbf
Hydrostatic Head Resistance	ASTM D5385	100 psi (231 ft)
Water Vapor Transmission	ASTM E96	.033 perms

Part 5 -

3. **E.Protect Wall** composite system consists of 80 mil layer of **e.spray** (polymer modified asphalt membrane), and **e.shield 115** (15 mil polyolefin protection layer). Designed to handle a wide variety of positive side wall conditions, while providing enhanced protection against common backfill materials.

Part 6 -

PROPERTIES	TEST METHOD	VALUE
Tensile Strength	ASTM D412	1027.7 psi
Elongation	ASTM D412	664%
Adhesion to Concrete	ASTM D903	20.0 lbf/in
Puncture Resistance	ASTM D1709	57.2 lbf
Hydrostatic Head Resistance	ASTM D5385	100 psi (231 ft)
Water Vapor Transmission	ASTM E96	.0374 perms

Part 7 -

2.3 WATERPROOFING MATERIALS

A. Polymer Modified Asphalt

1. **e.spray**: **e.spray** is a non-hazardous, low-viscosity, water-based, anionic asphalt emulsion modified with a blend of synthetic polymerized rubbers and proprietary additives. **e.spray** is highly stable during transit and proper storage, but becomes highly reactive during the spray application to form a rapidly cured membrane with exceptional bonding, elongation, and hydrophobic characteristics.

Part 8 -

PROPERTIES	TEST METHOD	VALUE
Color		Brown to Black
Solvent Content		No Solvents
Shelf Life		6 Months
Tensile Strength	ASTM D412	32 psi
Elongation	ASTM D412	4140%
Resistance to Decay	ASTM E154 Section 13	4% Perm Loss
Accelerated Aging	ASTM G23	No Effect
Moisture Vapor Transmission	ASTM E96	0.026 g/ft ² /hr
Hydrostatic Water Pressure	ASTM D751	26 psi
Perm Rating	ASTM E96	0.21 perms
Methane Transmission Rate	ASTM D1434	0
Adhesion to Concrete & Masonry	ASTM C836 & C704	20 lbf/inch
Adhesion to HDPE	ASTM C836	28.363 lbf/inch
Adhesion to Polypropylene Fabric	ASTM C836	31.19 lbf/inch
Hardness	ASTM C836	80
Crack Bridging	ASTM C836-00	No Cracking
Low Temp. Flexibility		No Cracking at -20° C
Packaging: 55 gallon drum, 275 gallon tote, 330 gallon tote		

Part 9 -

Part 10 -

2. **e.roll: e.roll** is a medium viscosity water-based, polymer-modified anionic asphalt emulsion, which exhibits exceptional bonding, elongation and waterproofing characteristics.

Part 11 -

PROPERTIES	TEST METHOD	VALUE
Color		Brown to Black
Solvent Content		No Solvents
Shelf Life		6 Months
Tensile Strength	ASTM D412	32 psi
Elongation	ASTM D412	3860%
Resistance to Decay	ASTM E154 SECTION 13	9% Perm Loss
Accelerated Aging	ASTM G23	No Effect
Moisture Vapor Transmission	ASTM E96	0.071 g/ft ² /hr
Hydrostatic Water Pressure	ASTM D751	28 psi
Perm Rating	ASTM E96	0.17 perms
Methane Transmission Rate	ASTM D14334	0
Adhesion to Concrete & Masonry	ASTM C836	1 lbf/inch
Hardness	ASTM C836	85
Crack Bridging	ASTM C836	No Cracking
Low Temp. Flexibility	ASTM C836-00	No Cracking at -20° C
Packaging: 5 gallon bucket		

B. Geocomposite Base Sheet

1. **e.base 205: e.base 205** is a base course comprised of an HDPE film and non-woven polypropylene geotextile fabric. The film is cross laminated to a create ridges that enhance the bond between the **e.base 205** and **e.spray**.

Part 12 -

PROPERTIES	TEST METHOD	VALUE
Film Material		HDPE
Film Color		Gray
Fabric Material		Non-woven Polypropylene
Fabric Color		White
Film Thickness		5 Mil
Composite Thickness		18 Mil
Tensile @ ULT	ASTM D882	TD: 32.0 lbs/in MD: 37.3 lbs/in
Elongation @ ULT	ASTM D882	TD: 65.3% MD: 51.0%
Dart Impact	ASTM D1709	Method A: >1070 grams Method B: 894 grams
Modulus	ASTM D882	TD: 270.6 lbs/in MD: 295.5 lbs/in
Elmendorf Tear	ASTM D1922	TD: 5,140 grams MD: 5,260 grams
Puncture-Prop Tear	ASTM D2582	TD: 13,250 grams Sled: 1-lb MD: 11,290 grams Sled: 1-lb
Beach Puncture Tear	ASTM D751	TD: 165 in-lbs MD: 160 in-lbs
Water Permeance	ASTM E96	0.11 perms
Dimensions: 12' x 150'		
Weight: 108 pounds		

Part 13 -

C. Polyolefin Sheet Membrane

1. **e.shield 115: e.shield 115** is a red 15 mil geomembrane made from a custom blend of polyolefin copolymers.

Part 14 -

PROPERTIES	TEST METHOD	VALUE
Film Material		Polypropylene
Film Color		Red
Film Thickness		15 Mil
Classification	ASTM E1745	Class A, B & C
Water Vapor Permeance	ASTM F1249	0.0078 perms
Tensile Strength	ASTM D882	64 lbf./inch
Puncture Resistance	ASTM 1709	4000 grams
Life Expectancy	ASTM E154	Indefinite
Chemical Resistance	ASTM E154	Unaffected
Low Temp. Impact	ASTM D1790	Resistant to 105° C
Methane Gas Modified	ASTM D1434	252.55 GTR
ACI 302.1 R-96 Minimum Thickness 10-mils		Exceeds
Dimensions: 12' X 150'		
Weight: 144 pounds		

Part 15 -

D. Geocomposite Bentonite Membrane

1. **e.shield 205b: e.shield 205b** is a redundant geocomposite bentonite membrane comprised of three distinct layers, a nonwoven polypropylene geotextile, an HDPE film, and then a chemically bonded layer of sodium montmorillonite bentonite.

Part 16 -

PROPERTIES	TEST METHOD	VALUE
Film Material		HDPE
Film Color		Gray
Fabric Material		Non-woven Polypropylene
Fabric Color		White
Bentonite		Sodium Montmorillonite (>90%)
Tensile Strength: Membrane (psi)	ATSM D882	6,100 psi (42 MPa)
% Elongation at break	ATSM D882	100%
Overall Weight		0.6 lb per ft ² (2.44 kg/m ²)
Resistance	ATSM D751 Procedure A	174 ft. (52.9 m) of water
Crack Bridging		1.8" (.032 cm) crack
Water Vapor Permeability	ATSM E96	0.53 x 10 ⁻³ cm/sec
Dimensions: 4' x 32'		
Weight: 75 pounds		

Part 17 -

Part 18 -

E. Geocomposite Bentonite Transition Course

1. **e.shield bb: e.shield bb** is a double layer of bentonite reinforce with a 20 mil layer of high density polyethylene.

Part 19 -

PROPERTIES	TEST METHOD	VALUE
Reinforcement Membrane		HDPE
Reinforcement Membrane Thickness		20 mil
Bentonite		Sodium Montmorillonite
Weight		1.5 lb per ft ² (7.34 kg/m ²)
Puncture Resistance	ASTM E154-88	172 lb. (77.5 kg)
Membrane Tensile Strength	ASTM D638	MD: 3670 psi (31.3 MPa), TD: 3500 psi (29.9 MPa)
% Elongation at Break	ASTM D638	>700%
Peel Adhesion of Geotextile	ASTM C836	28 lb/in
Resistance to Hydrostatic Head	ASTM D5385	100 psi (231 ft)
Permeability	ASTM E96-80	0.024 perms (grains/ ft ² hr in HG)
Resistance to Micro-organisms	ASTM E154-88-13	Unaffected
Toxicity		Non-Toxic
Freeze Thaw Cycles		No effect before or after installation
Installation Temperatures		-25°F to 150°F (-31.7°C to 54.4°C)
Dimensions: 3.5' X 14.3'		
Weight: 75 pounds		

Part 20 -

F. Prefabricated Drainage

1. **e.drain 6000: e.drain 6000** features a lightweight three-dimensional, high-compressive strength polypropylene core and bonded non-woven geotextile fabric. The bonded filter fabric allows water to pass freely into the molded drain while preventing soil particles from entering and clogging the core structure.

Part 21 -

PROPERTIES	TEST METHOD	VALUE
DIMPLED CORE		
Core Material		Polypropylene
Color		Black
Dimple Height	ASTM D1777-96	0.4" (10.16 mm)
Compressive Strength	ASTM D6364-06	16,500 psf (790 kN/m ²)
Flow rate	ASTM D4716	21 gal/min/ft
FILTER FABRIC		
Grab Tensile	ASTM D4632-91	100 lbs
CBR Puncture resistance	ASTM D6241	250 lbs
Apparent Operating Size	ASTM D4751-99	70 sieve size (.0212 mm)
Water Flow Rate	ASTM D4491-99	140 gpm/ft ² (5704 l/min/m ²)
UV Resistance	ASTM D4355-92	70% (500 hrs)
Dimensions: 6' x 5'		
Weight: 63 pounds		

2. **e.drain 12ds**: **e.drain 12ds** features a lightweight three-dimensional, highly flexible polypropylene core and a non-woven geotextile filter fabric. The filter fabric is bonded to the dimples of the polypropylene core to prevent clogging within the drain.

Part 22 -

PROPERTIES	TEST METHOD	VALUE
DIMPLED CORE		
Core Material		Polypropylene
Color		Black
Compressive strength	ASTM D1621	9,500 PSF (455 kN/m ²)
Thickness	ASTM D1777	1 Inch
Flow rate	ASTM D4716	30 gpm/ft of width
FILTER FABRIC		
CBR puncture	ASTM D6241	250 lbs
Grab tensile strength	ASTM D4632	100 lbs
AOS	ASTM D4751	70 U.S. sieve
Permitivity	ASTM D4491	2.0 sec ⁻¹
Flow rate	ASTM D4491	140 gpm/ft ²
UV resistance	ASTM D4355	70% (500 hrs)
Dimensions: 165' x 12" x 1"		
Weight: 65 pounds		

Part 23 -

2.4 AUXILIARY MATERIALS

- A. General: All accessory products shall be provided by the specified waterproofing manufacturer. Auxiliary products used in lieu of, or in addition to, the manufactures products must be approved in writing by EPRO prior to installation.
- B. Reinforcement Fabric: Manufacturer's polyester fabric, **e.poly** is available in 6 inch, 12 inch, and 40 inch widths.
- C. Detailing Material: **e.roll**, a roller applied water based high viscosity polymer modified asphaltic material OR **e.trowel**, a trowel applied water based high viscosity polymer modified asphaltic material.
- D. Backer Rod: Closed cell polyethylene foam
- E. Water Stop: A double row **e.stop b** shall be placed at all cold joints, construction joints, penetrations, and steel beams in back lagged conditions. Water stop is not required at lift joints. A single row of **e.stop b** is actable at elevations above the design water table.
- F. Vertical Membrane Fastener: **e.hanger** with ¾ inch washer
- G. Termination Bar: **e.term hd**, or approved alternate
- H. Shot Pins: Minimum 1-inch galvanized steel pins with ¾ inch aluminum washer.

Part 4 - EXECUTION

4.1 EXAMINATION

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

Part 24 -

4.1.3 SURFACE PREPARATION

- A. The general contractor shall engage the certified waterproofing contractor and certified inspector to ensure surfaces are prepared in accordance with manufacturer's instructions. Unless, explicitly stated in the contract documents, the waterproofing contractor is not responsible for surface preparation.
- B. Examine all substrates, areas, and conditions under which the composite membrane system will be installed, applicator and inspector must be present. Do not proceed with installation until unsatisfactory conditions have been corrected and a surface prep requirements have been met. If conditions exist that are not addressed in this section notify inspector and contact EPRO for additional clarification.
- C. Soil Substrates: Native soil and sand substrates shall be uniformly compacted to meet structural and building code requirements. All surfaces shall be free from protrusions and debris that may compromise the membrane system. Free standing water must be removed prior to application.
- D. Aggregate Substrates: Aggregate substrates shall be compacted to meet structural and building code requirements and then rolled flat to provide a uniform substrate. $\frac{3}{4}$ inch minus aggregate with no more than one fractured face is recommended, but other aggregates substrates may be approved by the manufacturer provided they do not create sharp angular protrusions that may compromise the waterproofing/vapor intrusion system.
- E. Working Slab: Mud slab, rat slab, or other concrete working slab shall have a uniform plane with a light broom or light trowel finish.
- F. Wood Lagging: Wood lagging shoring should extend to the lowest level of the waterproofing installation with any voids or cavities exterior of the lagging timbers filled with compacted soil or cementitious grout. Interior surface of lagging boards should be planar, with no greater than 1-inch variance in a 12-inch plane, and fit tight together with gaps less than 2 inches (25 mm). Gaps in excess of 2 inches should be filled with cementitious grout, compacted soil, wood, extruded polystyrene (20 psi min.) or EPRO approved polyurethane spray foam. Plywood or other surface treatment may be used over large lagging gaps up to 6 inches, if soil conditions permit. All lagging board nails and other mechanical projections shall be removed or flattened. Install a protection material over all soldier piles with raised lagging hanger bolts, form tie rods, or other irregular surface; protection material should extend a minimum 6 inches (150 mm) to both sides of the steel piling. **e.drain 6000** and **e.drain 12ds** base drain system should be connected to an operative water discharge system. **NOTE: In hydrostatic conditions gaps in lagging shall not exceed 1 inch.**
- G. Shotcrete, Secant Pile, Rock Face, or Caisson Shoring Walls: Interior surface of retention walls should be planar without irregular surface conditions and a light trowel finish. Voids and sharp transitions that leave a void space to the outside of the drainage and waterproofing installation need to be filled to create a uniform and planer surface. Irregular rock and concrete, void pockets greater than $\frac{3}{4}$ inch, cracks, sharp concave transitions should be completely filled or smoothed with cementitious grout, shotcrete, or other solid material approved by the manufacturer
- H. Sheet Piles: Minimum $\frac{1}{2}$ inch plywood must be butt jointed to form a uniform substrate that spans deviations created by the piles. Voids between the plywood and shoring shall be filled a high strength grout or other suitable material.
- I. Negative Side Internal Bracing: Internal shoring bracing, such as rakers, should be uniform and circular when interfacing with the shoring wall. Irregular bracing, such as soldier piles, creates problematic detailing and is not an approved material at the wall interface.
- J. Cast-in-Place or Shotcrete Walls: Application to green concrete is acceptable provided the substrate is prepared in accordance with manufacturers specifications and published instructions.
 - 1. Provide a clean, dust-free, and dry substrate for waterproofing application.

2. Surfaces shall be power washed to remove grease, oil, form release agents or any other penetrating contaminants from the concrete. No agents shall be visible prior to the application of **e.spray**.
3. Remove all fins, ridges, and other protrusions.
4. Fill honeycomb, aggregate pockets, tie holes, and other voids with hydraulic cement, or rapid-set grout.

K. Precast Concrete Walls:

1. Provide a clean, dust-free, and dry substrate for waterproofing application.
2. Surfaces shall be power washed to remove grease, oil, form release agents, or any other penetrating contaminants from the concrete. No agents shall be visible prior to the application of **e.spray**.
3. Remove all fins, ridges, and other protrusions.
4. Fill honeycomb, aggregate pockets, tie holes, and other voids with hydraulic cement, or rapid-set grout. All grout should be struck smooth and without pinholes.
5. Fill precast panel and control joints with a suitable backer rod material and sealant approved by manufacturer.

4.2 UNDERSLAB MEMBRANE INSTALLATION – E.PROTECT UNDERSLAB

- A. General: The underslab composite membrane system shall be installed under strict accordance with the manufactures guideline and project specifications. The underslab system shall transition to, and overlap the vertical waterproofing membrane as specified.
- B. Termination: The underslab system shall terminate a minimum of 2 feet past the top of the slab, or 2 feet past the design water table, whichever is the higher elevation. Coordination between the applicator, inspector, general contractor and concrete contractor is crucial and necessary to ensure proper installation of the termination detail.
- C. Transition to Vertical Walls: When transitioning the horizontal underslab system vertically to a blindside shoring wall, the first layer of drainage shall be installed prior to the placement of any concrete at the perimeter of the excavation, and prior to the placement of any other system materials. The first lift of the composite membrane system shall extend a minimum of 4 feet past the first lift of rebar.

1.1.1 GEOCOMPOSITE BASE COURSE

- A. Whenever possible roll out **e.base 205** in the same direction over the substrate. When multiple pours will occur, extend the **e.base 205** a minimum of 2 feet past the pour joint. In order to ensure a proper tie-in, mask off the 2 foot section past the pour joint and protect it from damage.
- B. Overlap **e.base 205** a minimum of 6 inches.
- C. At the seam overlap peel back the top layer of **e.base 205** and apply 30 mils into the overlapping seam, making certain to apply **e.spray** to both the top of the bottom sheet and the bottom of the top sheet. Embed the top sheet into the bottom sheet.

Part 25 -

- D. Apply a reinforcement detail over the **e.base 205** seam overlap. Apply 30 mils of **e.roll** 3 inches onto both sides of the seam overlap, center and embed 6-inch reinforcement fabric over the seam, and apply 30 mils of **e.roll** to fully saturate the reinforcement fabric.
- E. NOTE: In windy conditions secure the **e.base 205** base course a long edges of application area using 6-inch nail with washer. If nails are used to secure the base course, a 6-inch square patch of **e.base 205** shall be centered over the nail head and then sealed with **e.spray** to create watertight seal.

1.1.2 SEALING OF PENETRATIONS

- A. Sealing of Standard Penetrations: Prepare membrane penetrations so they are free of any material that will inhibit a direct bond to the penetration surface: foam, insulation, protective coatings, etc.
 - 1. Trim **e.base 205** field base sheet to within 1/8 inch of the penetration.
 - 2. Cut target piece of **e.base 205** so that it extends a minimum of 6" from the base of the penetration.
 - 3. On the target piece create two offsetting "x" to the inside diameter of the pipe to create a total of 8 triangular flanges.
 - 4. Slide target piece over the penetration with the triangular flanges facing up.
 - 5. Secure the **e.base 205** target piece to the underlying **e.base 205** by applying 30 mils of **e.spray** under the target piece.
 - 6. Apply **e.roll** between the triangular flanges and the penetration.
 - 7. Place a nylon cable tie around the penetration and firmly tighten around the penetration to reinforce the bond between the **e.roll**, the triangular tabs, and penetration.
 - 8. Tightly wrap the penetration by pressing **e.stop b** firmly around the base of the penetration.
 - 9. Apply **e.roll** 3 inches horizontally and 3 inches vertically around the base of the penetration, including **e.stop b**.
 - 10. Embed reinforcement fabric 3 inches horizontally and 3 inches vertically around the base of the penetration.
 - 11. Apply a second layer of **e.roll** to reinforcement fabric until the reinforcement fabric is fully saturated. Secure reinforcement fabric to penetration with a cable tie.
 - 12. Cut to a target piece of reinforcement fabric to the outside diameter of the penetration.
 - 13. Place target piece around the penetration and embed into existing saturated reinforcement fabric, saturate fabric with **e.roll**.
 - 14. Prior to the placement of concrete place another **e.stop b** 1 inch past the top of the penetration and secure with a cable tie.
- B. Soldier Pile Penetrations: Sealing of soldier piles in the field or in a back lagged condition.
 - 1. Clean pile to remove any dirt or rust.

2. Create a uniform collar around each soldier pile penetration by cutting a target piece of **e.base 205** for each interior and exterior face of the soldier pile. Each target piece of **e.base 205** shall extend 6 inches vertically up the soldier pile and 12 inches horizontally from the base of the soldier pile. If applying in a back lagged condition, cut target piece so it also extends minimum 6 inches horizontally from the base of the soldier pile.
3. Apply 30 mils of **e.roll** to the underlying **e.base 205** and embed the **e.base 205** target piece into the **e.roll**.
4. Apply a 30 mil coat of **e.roll** onto all of underlying vertical surfaces.
5. Embed **e.base 205** into the vertically applied **e.roll**.
6. Tightly wrap the pile by pressing **e.stop b** firmly around the base of the soldier pile.
7. From the base of the soldier pile apply **e.roll** 3 inches vertically and horizontally onto the **e.base 205** collar while encapsulating the **e.stop b**.
8. Embed reinforcement fabric into the previously applied **e.roll** and then saturate fabric with another 30 mil application of **e.roll**.
9. Trim **e.base 205** base sheet and heat weld to collar piece to form a continuous and uniform transition from the base sheet to the collar.
10. 2 rows of **e.stop b** shall be installed vertically on the interior cross section of the soldier pile and extend from the top of the collar to the top of wall.

1.1.3 POLYMER MODIFIED ASPHALT MEMBRANE

- A. Mask off adjoining surfaces where unwanted **e.spray** polymer modified asphalt membrane may impact other construction trades.
- B. Commence application of **e.spray** when ambient air temperatures are within manufacturer recommendations.
- C. Surfaces that will receive the **e.spray** membrane must be clean and free from standing moisture.
- D. Start installing **e.spray** in presence of approved 3rd party inspector.
- E. Apply one application of **e.spray** waterproofing in accordance to manufacturer's instructions in order to obtain a seamless membrane with a minimum dry film thickness of 80 mils (2 mm).
- F. Apply **e.spray/e.roll** in and around penetrations and cavities to ensure the formation of monolithic seal around all penetrations.
- G. Apply **e.spray/e.roll** to prepared wall terminations and vertical surfaces to heights indicated according to manufacturer's recommendations and details. (if applicable)
- H. Verify film thickness of **e.spray** every 1000 ft² (93 m²).

1.1.4 GEOCOMPOSITE BENTONITE PROTECTION COURSE

- A. Install **e.shield 205b** protection course perpendicular to the direction of base course.

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- B. Overlap **e.shield 205b** seams a minimum of 3 inches and seal the seams in order to prevent moisture from prematurely activating the bentonite layer. Either option is acceptable to the manufacturer, however any prematurely activated bentonite may be need to be replaced. The available options are as follows:
 - 1. Option 1: Secure the seams of **e.shield 205** by applying 30 mils of **e.spray** in-between the seam overlap. Apply a second 30 mil layer of **e.spray** on top of the seam overlap, completely covering the seam overlap.
 - 2. Option 2: Apply a reinforcement detail over the **e.shield 205b** seam overlap. Apply 30 mils of **e.roll** 3 inches onto both sides of the seam overlap, center and embed 6-inch reinforcement fabric over the seam, and apply 30 mils of **e.roll** to fully saturate the reinforcement fabric.
- C. Do not penetrate the membrane system once it has been applied. If the waterproofing system is penetrated, immediately contact the applicator and inspector. Failure to bring the breach of the membrane to the applicators attention and not allowing adequate time to make the necessary repair will result in voidance of warranty.

1.1.5 WATERSTOP INSTALLATION

- A. Surface to receive waterstop shall be clean, dry, and have a smooth finish.
- B. Place two rows of **e.stop b** at minimum of 3 inches with minimum of 2 inch of coverage at all cold joints, and concrete to steel beam connections.
- C. Place a minimum of 2 rows of **e.stop b** around all penetrations, with a minimum of 3 inch spacing, or as directed by manufacturer in specification sections that address penetrations.

1.2 SHORING WALL INSTALLATION – E.PROTECT SHORING

- A. General: The composite membrane system shall be installed to the shoring system under strict accordance with the manufactures guideline and project specifications. This section describes the installation process for the system application to a shored wall condition.
- B. Sequencing: The first lift of the composite membrane system shall be installed prior to the placement of any concrete at the perimeter of the excavation and prior to any transition from the underslab system to vertical system. This initial drainage and underslab barrier shall extend a minimum of 4 feet past the first lift of rebar.

1.1.1 PREFABRICATED STRIP DRAIN

- A. **e.drain 12ds** is not required for projects in the water table. If required for dewatering above the water table, install **e.drain 12ds** horizontally against the shoring wall at specified elevation above the design water table. Allow for positive drainage flow into water discharge system. Attach to shoring using washered mechanical fasteners.

1.1.2 PREFABRICATED DRAINAGE MAT

- A. General: For applications to wood lagging, ½ inch cement backer board must be centered on the soldier pile and extend laterally a minimum of 6 inches past the edge of the pile flange. The board must then extend 1 foot past the intended top elevation of the pile. Cement backer board must be installed prior to the prefabricated drainage composite.
- B. Install drainage panels either horizontally or vertically with the geotextile fabric facing the soil retention system.

- C. Overlap seams of the drainage composite panels 6 inches and fasten **e.drain 6000** to substrate with 2-inch flat washer fasteners a minimum of every 24 inches on center on seams and terminations, and a minimum of every 48 inches on center in field.
- D. Place anchors or tie backs through the drainage mat by slitting vertically and sliding over the anchor as snug as possible.

1.1.3 GEOCOMPOSITE BASE COURSE

- A. General: When tying into an underslab system extend the vertical base onto the horizontal and extend 1 foot past the inside face of the foundation wall.
- B. Install the **e.base 205** over the **e.drain 6000** by running the **e.base 205** vertically from the top of the wall to the bottom of the excavation.
- C. Overlap the seams of the **e.base 205** using a 6-inch overlap.
- D. Fasten **e.base 205** to soil retention system using **e.hanger**.
 - 1. Install a row of **e.hanger** 3 feet on center along the bottom of the wall 3 inches from the bottom of the slab. Secure using galvanized steel pins.
 - 2. Alternate the next row of **e.hanger** 3 feet and 4.5 feet from the first row of **e.hanger**, and then run additional stick pins every three feet on center to the top of wall.
 - 3. Run an additional row of **e.hanger** 2 inches on center and placed 3 inches from planned top edge of **e.shield bb**. **e.shield bb** shall be centered over the top of slab at the bottom of wall elevation.
 - 4. Install **e.hanger** 2 feet on center along the seam overlap of **e.base 205**. Do not place **e.hanger** directly on overlapped seam.
 - 5. Cut a 1 inch by ½ inch piece of **e.stop b** and press the center of the water stop through the stick **e.hanger**.
 - 6. Cut a minimum 6-inch patch of **e.base 205** and push it over the **e.hanger**. The ridges of the **e.base 205** shall run perpendicular to the initial base sheet for added reinforcement. Secure patch to underlying **e.base 205** by applying 30 mils of **e.roll** to the **e.hanger** and patch area.
 - 7. At the seam overlap peel back the top layer of **e.base 205** and apply 30 mils into the overlapping seam, making certain to apply **e.spray** to both the top of the bottom sheet and the bottom of the top sheet. Embed the top sheet into the bottom sheet.
 - 8. Apply a reinforcement detail over the **e.base 205** seam overlap. Apply 30 mils of **e.roll** 3 inches onto both sides of the seam overlap, center and embed 6-inch reinforcement fabric over the seam, and apply 30 mils of **e.roll** to fully saturate the reinforcement fabric.
- E. Corner Detail: Transition **e.base 205** through all inside corners. Corner detailing should occur in conjunction with the installation of the thermoplastic base sheet if an underslab system is used.
 - 1. All overlapped seams shall have a reinforcement detail placed over the seam overlap. Apply a 30 mil coat of **e.roll** to desired area extending 3 inches beyond the joint or area of repair. Embed a **e.poly** joint reinforcing strip into the previously applied **e.roll**. Apply a second 30 mil coat of **e.roll** over reinforcement fabric ensuring full saturation.

2. First Corner Target Piece: Cut a corner detailing target piece of **e.base 205** that will be placed to reinforce the corner. This detailing target piece must be a 4 feet wide. The length/height of the piece should account for the target piece extending two feet onto the horizontal underslab area and must extend a minimum of 2 feet past the first lift. It is possible to extend the target piece from the base of the wall to the top of grade, but not mandatory. The target piece shall then be folded in half along its longest edge to form a crease, and then the bottom two feet of the target piece shall be cut along the crease to create to flanges at the bottom of the sheet. Place the **e.base 205** corner target piece into the corner with 2 foot flanges extending onto the underslab area. Overlap the flanges and detail using **e.roll** in the seam overlaps, over the seam detail shall be placed a reinforcement detail.
3. Place target piece into the corner with white geotextile facing the shoring wall, and secure to the shoring wall using galvanized steel fasteners. Detail fasteners with a 6 inch by 6 inch repair patch **e.base 205** and detail each patch with a reinforcement detail.
4. If necessary, extend the target piece vertically to grade or lift height. Overlap **e.base 205** 6 inches onto previously installed target, apply 30 mils of **e.roll** into the seam overlap, and then apply a reinforcement detail to the seam overlap.
5. Install **e.base 205** on the remainder of the vertical wall to the top of the wall or previously determined height and extend over the previously installed corner detail piece. Terminate the vertically placed **e.base 205** onto the target piece 6 inches from the corner. At the base of foundation wall corner, extend **e.base 205** over the previously installed target piece and apply 30 mils of **e.roll** into the seam overlap. Apply a reinforcement detail over the seam overlaps.
6. Second Corner Target Piece: Cut a corner detailing target piece of **e.base 205** that will be placed to reinforce the corner. This detailing target piece must be a 2 feet wide. The length/height of the piece should account for the target piece extending two feet onto the horizontal underslab area and must extend a minimum of 2 feet past the first lift, or top of wall. Place into corner over the previously installed corner target piece and base sheet. Apply 30 mils of **e.roll** into the seam overlaps and then apply a reinforcement detail to the seam overlap.
7. Do not place **e.hanger** into the corner detail. Securing of vertical sheets shall take place at the 6 inches from the corner target edge.
8. Underslab Base Sheet: Install underslab **e.base 205** and overlap onto the target sheet a minimum of 12 inches. Apply 30 mils of **e.roll** into the seam overlaps and then apply a reinforcement detail to the seam overlap. If rebar rods or fasteners are used to secure concrete reinforcement they shall be installed upon completion of the thermoplastic base course.

1.1.4 SEALING OF PENETRATIONS

- A. Standard Pipe Penetrations: Standard penetration detailing should occur around all penetrations that are in place prior the membrane application, this includes soil nails, rock anchors, and tiebacks (non-hydrostatic).
 1. Prepare penetrations so they are free of any material that will inhibit a direct bond to the penetration surface.
 2. Trim **e.base 205** to within 1/8 inch of the penetration.
 3. Cut target piece of **e.base 205** so that it extends a minimum of 6 inches from the base of the penetration.

4. On the target piece create two offsetting “x” to the inside diameter of the pipe in order to create a total of 8 triangular flanges.
 5. Slide target piece over the penetration with the triangular flanges facing up.
 6. Secure the **e.base 205** target piece to the underlying **e.base 205** by applying 30 mils of **e.spray** under the target piece.
 7. Apply **e.roll** between the triangular flanges and the penetration.
 8. Place a nylon cable tie around the penetration and firmly tighten around the penetration to reinforce the bond between the **e.roll**, the triangular tabs, and penetration.
 9. Tightly wrap the penetration by pressing **e.stop b** firmly around the base of the penetration.
 10. Apply **e.roll** 3 inches horizontally and 3 inches vertically around the base of the penetration, including **e.stop b**.
 11. Embed reinforcement fabric 3 inches horizontally and 3 inches vertically around the base of the penetration.
 12. 6-inch reinforcement fabric is acceptable for most penetrations, for soil nails, rock anchors, and tiebacks (non-hydrostatic) 12-inch reinforcement fabric is required.
 13. Apply a second layer of **e.roll** 3 inches to reinforcement fabric until the reinforcement fabric is fully saturated.
 14. Cut a target piece of reinforcement fabric to the outside diameter of the penetration.
 15. Place target piece around the penetration and embed into existing saturated reinforcement fabric, saturate fabric with **e.roll** and secure flanges to the penetration with a nylon cable tie.
 16. Prior to the placement of concrete place another **e.stop b** 1 inch past the top of the penetration and secure with a cable tie.
- B. Tieback Covers: Tieback covers are required in hydrostatic conditions.
1. Provide at 24 inch by 24 inch block out area around all tiebacks and ensure a 6-inch minimum clearance around each tieback. The block out area must free of any material that may hinder a successful seal.
 2. EPRO Tieback Cover (or galvanized steel canisters) shall be placed over the tieback and secured to the shoring.
 3. Treat tieback detailing as a standard penetration.
 4. Inject tieback cover with waterproof closed cell foam.
- C. Rebar Rods: Rebar rods, steel fasteners, or anchor bolts used to secure concrete reinforcement shall be in place upon completion of the thermoplastic base course. No additional rebar rods, steel fasteners, or anchor bolts are to be installed after completion of the entire system.
1. Rebar rods shall be secured directly perpendicular to the vertical wall. Each rod shall be secured without the need of any additional support.
 2. Install **e.stop b** around the base of the penetration.

3. Apply **e.roll** 3 inches horizontally and 3 inches vertically around the base of the penetration, including **e.stop b**.
4. Embed reinforcement fabric 3 inches horizontally and 3 inches vertically around the base of the penetration.
5. 6-inch reinforcement fabric is acceptable for most penetrations, but soil nails, rock anchors, and tiebacks (non-hydrostatic) will require 12-inch reinforcement fabric.
6. Apply a second layer of **e.roll** 3 inch to reinforcement fabric until the reinforcement fabric is fully saturated.

1.1.5 POLYMER MODIFIED ASPHALT MEMBRANE

- A. Mask off adjoining surfaces where unwanted **e.spray** polymer modified asphalt membrane may impact other construction trades.
- B. Commence application of **e.spray** applied polymer modified asphalt when ambient air temperatures are within manufacturer recommendations.
- C. Surfaces that will receive the membrane must be clean and free from standing moisture.
- D. Start installing **e.spray** in presence of approved 3rd party inspector.
- E. Moving from the low point to the high point of the wall, apply one application of **e.spray** waterproofing in accordance to manufacturer's instructions in order to obtain a seamless membrane with a minimum dry film thickness of 80 mils (2 mm).
- F. Apply **e.spray/e.roll** in and around penetrations and cavities to ensure the formation of monolithic seal around all penetrations.
- G. Apply **e.spray/e.roll** to prepared wall terminations and vertical surfaces to heights indicated according to manufacturer's recommendations and details. (if applicable)
- H. Verify film thickness of **e.spray** every 1000 ft² (93 m²).

1.1.6 GEOCOMPOSITE BENTONITE PROTECTION COURSE

- A. The previously installed membrane shall not be penetrated by any pins, nails, pencil rods, or other foreign objects.
- B. Hang **e.sheild 205b** protection course vertically over nominally cured polymer modified asphaltic membrane. The gray bentonite side shall face the spray applied **e.spray** and the geotextile fabric shall be facing away from the wall.
- C. Overlap **e.sheild 205b** seams a minimum of 3 inches.
- D. Carefully press **e.sheild 205b** against the wall to secure the system onto the previously installed **e.hanger**. Secure **e.sheild 205b** in place with ½ inch stick pin washer. Do not place on, or below, the row of stick pins designated for the protection course.
- E. Seal the seams in order to prevent moisture from prematurely activating the bentonite layer. Either option is acceptable to the manufacturer, however any prematurely activated bentonite may be need to be replaced. The available options are as follows:
 1. Option 1: Secure the seams of **e.sheild 205b** by applying 30 mils of **e.spray** in-between the seam overlap. Apply a second 30 mil layer of **e.spray** on top of the seam overlap, completely covering the seam overlap.

2. Option 2: Apply a reinforcement detail over the **e.shield 205b** seam overlap. Apply 30 mils of **e.roll** 3 inches onto both sides of the seam overlap, center and embed 6-inch reinforcement fabric over the seam, and apply 30 mils of **e.roll** to fully saturate the reinforcement fabric.

- F. Do not penetrate or damage the composite membrane system once it has been applied. If the system is penetrated or damaged, contact the applicator immediately. Failure to bring the breach of the system to the applicator's attention and not allowing adequate time to make the necessary repair will result in voiding any warranty.

1.1.7 GEOCOMPOSITE BENTONITE TRANSITION COURSE

- A. **e.shield bb** is designed provide additional redundancy along the slab to wall interface. Center **e.shield bb** along the cold joint making certain to have a minimum 18 inches of **e.shield bb** above the top of the joint.
- B. Overlap the **e.shield bb** seams a minimum of 6 inches.
- C. Carefully press the **e.shield bb** onto the previously installed **e.hanger**. Secure **e.shield bb** in place with ½ inch stick pin washer.
- D. Secure the seams of **e.shield bb** by applying 30 mils of **e.spray** in-between the seam overlap.
- E. Apply a second 30 mil layer of **e.spray** on top of the seam overlap.
- F. Do not penetrate or damage the membrane system once it has been applied. If the waterproofing system is penetrated or damaged, contact the applicator immediately. Failure to bring the breach of the membrane to the applicators attention and not allowing adequate time to make the necessary repair will result in voiding any warranty.

1.1.8 TERMINATION AT TOP OF GRADE

- A. The system shall extend 2 feet past the top of the wall and be temporarily secured in place.
- B. When the wall is extended or a slab is placed at the top of wall, the cold joint shall be reinforced by applying 30 mils of **e.roll** on 3 inches of either side of the joint, embedding 6-inch reinforcement fabric, and then saturating the fabric with another application of 30 mils of **e.roll**.
- C. Trim the system to grade height and attach to the wall with a termination bar.
- D. Apply a reinforcement detail or bead of low VOC acrylic caulking over the top of the termination bar and continue transition per project drawings.

1.1.9 WATERSTOP INSTALLATION

- A. Surface to receive waterstop shall be clean, dry, and have a smooth finish.
- B. Place two rows of **e.stop b** at minimum of 3 inches with minimum of 2 inches of coverage at all cold joints, lift joints, and concrete to steel beam connections.
- C. Place a minimum of 2 rows of **e.stop b** around all penetrations, with a minimum of 3 inch spacing, or as directed by manufacturer in specification sections that address penetrations.

1.2 POSITIVE SIDE CONCRETE WALL INSTALLATION – E.PROTECT WALL

- A. General: The composite membrane system shall be installed to the positive side vertical wall under strict accordance with the manufacture's guideline and project specifications. This section describes the installation process for the system application to a freestanding cast-in-place concrete or shotcrete wall.
- B. Green Concrete: Application to green concrete is acceptable. Ambient temperatures, humidity, and concrete mix ratio can create blistering. If applying the system within 7 days of concrete placement contact manufacturer for further instruction.

1.2.2 TREATMENT OF CRACKS, JOINTS, AND REPAIRED AREAS

- A. Treat, rout, and fill cracks larger than 1/8 inch with hydraulic cement or rapid set grout.
- B. The following areas shall receive a reinforcement detail of **e.roll** and reinforcement fabric:
 1. All cracks less than 1/8 inch.
 2. All previously repaired cracks.
 3. All cold joints.
- C. Reinforcement Detail: Apply a 30 mil coat of **e.roll** to desired area extending 3 inches beyond the joint or area of repair. Embed a joint reinforcing strip into the **e.roll**. Apply a second 30 mil coat of **e.roll** over **e.poly** reinforcement fabric ensuring full saturation.

1.2.3 DETAILING OF TRANSITIONS

- A. Corners: A reinforcement detail shall be applied to all transitions including all inside and outside corners, and all transitions from a horizontal to vertical planes.
- B. Underslab Transition: When the underslab composite membrane system transitions to a positive side concrete wall, the underslab system will terminate 2 feet above the slab to wall cold joint, or 2 feet above the design water table, whichever is greater.
- C. The underslab system will be fastened to the wall using **e.hanger**.
- D. Reinforcement Detail: Apply a 30 mil coat of **e.roll** to desired area extending 3 inches beyond the joint or area of repair. Embed a joint reinforcing strip into the **e.roll**. Apply a second 30 mil coat of **e.roll** over **e.poly** reinforcement fabric ensuring full saturation.

1.2.4 SEALING OF PENETRATIONS

- A. Standard Pipe Penetrations: Prepare membrane penetrations so they are free of any material that prohibit the material to bond directly to the penetration surface: foam, insulation, protective coatings, etc.
 1. Tightly wrap the penetration by pressing **e.stop b** firmly around the base of the penetration.
 2. Apply **e.roll** 3 inches horizontally and 3 inches vertically around the base of the penetration, including **e.stop b**.
 3. Embed **e.poly** reinforcement fabric 3 inches horizontally and 3 inches vertically around the base of the penetration.
 4. Apply a second layer of **e.roll** to the **e.poly** reinforcement fabric until the reinforcement fabric is fully saturated, and then secure the reinforcement fabric to the penetration with a cable tie.

5. Cut a target piece of **e.poly** reinforcement fabric to the outside diameter of the penetration.
6. Place target piece around the penetration and embed into existing saturated reinforcement fabric, saturate fabric with **e.roll**.

1.2.5 POLYMER MODIFIED ASPHALTIC MEMBRANE

- A. Mask off adjoining surfaces where unwanted **e.spray** polymer modified asphalt membrane may impact other construction trades.
- B. Commence application of **e.spray** when ambient air temperatures are within manufacturer recommendations.
- C. Surfaces that will receive **e.spray** must be sound, uniform, clean, and free from standing moisture.
- D. Start installing **e.spray** in presence of approved 3rd party inspector.
- E. Apply a 10 mil primer coat of un-catalyzed **e.spray** and allow to set. The primer coat is designed to reduce that amount of potential blistering that may occur as the concrete continues to release moisture.
- F. Moving from the low point to the high point of the wall, apply one application of **e.spray** in accordance with manufacturer's instructions in order to obtain a seamless membrane with a minimum dry film thickness of 80 mils (2 mm).
- G. Apply **e.spray/e.roll** in and around penetrations and cavities to ensure the formation of monolithic seal around all penetrations.
- H. Apply **e.spray/e.roll** to prepared wall terminations and vertical surfaces to heights indicated according to manufacturer's recommendations and details. (if applicable)
- I. Verify film thickness of **e.spray** every 1000 ft² (93 m²).

1.2.6 POLYOLEFIN PROTECTION COURSE

- A. Install **e.shield 115** protection course vertically or horizontally, either way is acceptable.
- B. Overlap **e.shield 115** seams a minimum 6 inches.
- C. Secure **e.shield 115** to **e.spray** with Sta'-Put Quick Grip LVOC spray adhesive, or approved alternate.
- D. Secure **e.shield 115** protection course seams with **e.tape**.

1.2.7 PREFABRICATED DRAINAGE MAT

- A. Horizontal Installation: Starting from one corner, run **e.drain 6000** horizontally along the base of the foundation.
 1. Secure drainage panels to the wall by using approved adhesives, adhesive strips, or fastened with shot pins or as recommended by manufacturer.
 2. Install the next layer of **e.drain 6000** in the same manner and overlap the next layer of drain mat 6 inches over the first layer of drain mat, thus creating a "shingle" effect. Continue this process to the top of the wall.

3. Terminate the drainage and membrane system using a termination bar and a reinforcement detail.
 4. Care shall be taken when backfilling against the membrane in order to prevent any damage during the backfill process. Angular rock 1 inch or greater shall not be used without written approval from the manufacturer.
 5. Backfill in lifts, taking precaution to not backfill above the previously placed **e.drain 6000**.
- B. Vertical Installation: Starting from the top of wall, install **e.drain 6000** from the top of the wall to the base of the foundation.
1. Overlap each roll of **e.drain 6000** 6 inches on all overlaps.
 2. Secure drainage composite panels to the wall by using by pressing drainage composite onto previously washered stick pins. Secure drainage composite by placing another stick pin washer over the drainage composite.
 3. Secure **e.drain 6000** with a termination bar at the top of grade and no greater than 3 inches from the top of the drain.
 4. Secure **e.drain 6000** using approved adhesives.
- C. Geocomposite Strip Drain: If using **e.drain 12ds**, secure strip drain at the bottom of the footing or just above the design water table.
- D. Do not penetrate or damage the composite membrane system once it has been applied. If the system is penetrated or damaged, contact the applicator immediately. Failure to bring the breach of the system to the applicator's attention and not allowing adequate time to make the necessary repair will result in voiding any warranty.

1.2.8 TERMINATION AT TOP OF GRADE

- A. Termination at the top of grade shall be done with using at termination bar. Secure the termination bar every 12 inches on center and the center a reinforcement detail on the termination bar.
- B. Reinforcement Detail - Apply a 30 mil coat of **e.roll** to desired area extending 3 inches beyond the joint or area of repair. Embed a joint reinforcing strip into the **e.roll**. Apply a second 30 mil coat of **e.roll** over **e.poly** reinforcement fabric ensuring full saturation.

1.3 FIELD QUALITY CONTROL

- A. Smoke Test: Conduct smoke test on all under slab areas upon installation of the base sheet, the sealing all of penetrations, and application of **e.spray**. All deficient areas shall be noted and marked for repair, then the necessary repairs shall be made. Refer to manufactures smoke testing protocol for additional guidance.
- B. Coupon Sampling: Destructive coupon sampling of the membrane in areas subjected to hydrostatic pressure is not allowed. Refer to manufactures target coupon sampling protocol for additional guidance.
- C. Independent inspectors and certified applicators shall document the amount of **e.spray** used and document quantities in the inspection report.

1.4 CURING PROTECTING AND CLEANING

- A. Allow for **e.spray** to fully bond with the substrate, generally this occurs 24 to 48 hours after application depending on ambient weather conditions.

- B. Take care to prevent contamination and damage during application stages and curing. All machinery, other trades, and general construction, shall NOT take place over the membrane until inspection is complete and concrete has been placed.
- C. Prevent damage during the placement of overburden.

1.5 REPAIRS

A. Shoring and Underslab:

1. Inspect damaged area to determine which system components have been damaged.
2. If the base sheet has not been compromised, patch only the areas that have been damaged by re-installing the damaged materials. The patch should extend 6 inches beyond the damaged area.
3. If the base sheet has been breached but no additional system components have been installed, install a patch below and above the base sheet that extends 6 inches beyond the damaged area. Area shall be sealed using the specified method for sealing the base sheet.
4. If the damaged area has breached the base sheet and additional components have been installed over the base sheet, the area will require removal of the overlying components to expose the base sheet.
5. If the damage is less than 3 inches, the base sheet will need to be opened up to create a minimum 4-inch diameter circle to allow access. Place a minimum 8-inch diameter coupon under the base sheet and seal using the specified method for seaming the base sheet. If heat welding the seam, probe the seam to ensure a uniform seal.
6. Apply a reinforcement detail of **e.roll** and reinforcement fabric 6 inches beyond the edge of the repair area.
7. Apply the remaining layers as specified.

B. Concrete Walls:

1. Inspect damaged area to determine which system components have been damaged.
2. Only patch the areas that have been damaged by re-installing the damaged materials. The patch should extend 6 inches beyond the damaged area.

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End of Section

E.PROTECT WALL FOR HYDROSTATIC WATERPROOFING AND VAPOR INTRUSION MITIGATION SPECIFICATION

SECTION 02 56 16 – GAS CONTAINMENT

SECTION 02 56 19.13 – FLUID-APPLIED GAS BARRIER

SECTION 07 14 16 – COLD FLUID-APPLIED WATERPROOFING

SECTION 07 17 16 – BENTONITE COMPOSITE SHEET WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. The installation of materials designed to provide below grade waterproofing and vapor intrusion protection when installed per project specification, this section covers the waterproofing and vapor intrusion membrane, along with the following:
 - 1. Surface preparation and substrate treatment
 - 2. Auxiliary materials
 - 3. Prefabricated drainage mat
 - 4. Foundation drain

1.3 RELATED SECTIONS

- A. Section 02 24 00: Environmental Assessment
- B. Section 02 32 00: Geotechnical Investigation
- C. Section 03 15 00: Concrete Accessories
- D. Section 03 30 00: Cast-in-Place Concrete
- E. Section 03 40 00: Precast Concrete
- F. Section 07 90 00: Joint Protection
- G. Section 31 30 00: Earthwork Methods
- H. Section 33 41 00: Subdrainage

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide a waterproofing system that prevents the passage of water under hydrostatic conditions, methane gas, contaminant vapor, and complies with the physical requirements as demonstrated by testing performed by an independent testing agency.

1.5 SUBMITTALS

- A. Product Data: For each type of waterproofing specified submit manufacturer's printed technical data, tested physical and performance properties, instructions for evaluating, preparing, and treating substrates, and installation instructions.
- B. Shop Drawings: Project specific drawings showing locations and extent of waterproofing, details for substrate joints and cracks, sheet flashing, penetrations, transitions, and termination conditions.
- C. Samples: Submit two standard size samples of the of the following:
 - 1. Individual components of the specified composite membrane system.
- D. Applicator Certification: Submit written confirmation at the time of bid that applicator is currently approved by the membrane manufacturer.

1.6 QUALITY ASSURANCE

- A. Applicator Qualifications: Waterproofing applicator shall be an EPRO Authorized Applicator who is trained and performs work that in accordance with EPRO standards and policies. For project requiring a no-dollar-limit labor and material warranty, the waterproofing applicator must be E.Assurance Certified at the time of bid.
- B. Third Party Inspection: Independent inspection of the composite system installation may be required based on project conditions and desired warranty coverage. Inspection reports shall be submitted directly to the composite waterproofing manufacturer and made available to other parties per the owners' direction. For projects requiring a no-dollar-limit labor and material warranty, an independent inspector must be E.Assurance Certified and comply with the documentation requirements.
- C. Water Sample: A 2-liter representative ground water sample shall be sent by the installation contractor to the manufacturer if contaminated groundwater and/or salt water has been discovered on the site. Email Watersample@eproinc.com to receive shipping instructions.
- D. Pre-Construction Meeting: A meeting shall be held prior to application of the waterproofing system to assure proper substrate preparation, confirm installation conditions, and any additional project specific requirements. Attendees of the meeting shall include, but are not limited to the following:
 - 1. EPRO representative
 - 2. EPRO certified applicator
 - 3. Third party inspector
 - 4. General contractor
 - 5. Owners representative
 - 6. Concrete/Shotcrete contractor
 - 7. Rebar contractor
 - 8. Project design team
 - 9. All appropriate related trades
- E. Field Sample: Apply waterproofing system field sample to 100 ft² (9.3 m²) of each assembly to demonstrate proper application techniques and standard of workmanship.

1. Notify composite membrane system manufacturer representative, architect, certified inspector, and other appropriate parties one week in advance of the dates and times when field sample will be prepared.
2. If architect and certified inspector determine that field sample does not meet requirements; reapply composite membrane system until field sample is approved.
3. Retain and maintain approved field sample during construction in an undisturbed condition as a standard for judging the completed composite membrane system. An undamaged field sample may become part of the completed work.

F. Materials: Composite membrane system and auxiliary materials shall be single sourced.

1.7 MATERIAL DELIVERY, STORAGE AND DISPOSAL

- A. Delivery: Deliver materials to site labeled with manufacturer's name, product brand name, material type, and date of manufacture. Upon the arrival of materials to the jobsite, inspect materials to confirm material has not been damaged during transit.
- B. Storage: Proper storage of onsite materials is the responsibility of the certified applicator. Consult product data sheets to confirm storage requirements. Storage area shall be clean, dry, and protected from the elements. If ambient air temperatures are expected to fall below 40°F, precautions will need to be taken to protect any polymer modified asphalt product from near freezing temperatures. Protect stored materials from direct sunlight.
- C. Disposal: Remove and replace any material that cannot be properly applied in accordance with local regulations and specification section 01 74 19.

1.8 PROJECT CONDITIONS

- A. Substrate Review: Substrates shall be reviewed by the certified applicator and accepted by the certified inspector prior to application. Application without signoff from certified inspector will likely result in voidance of warranty.
- B. Penetrations: All plumbing, electrical, mechanical, and structural items to be passing through the composite membrane system shall be properly spaced, positively secured in their proper positions, and appropriately protected prior to system application and throughout the construction phase. Braided grounding rods are not allowed to pass through the membrane in waterproofing applications.
- C. Clearance: Minimum clearance of 24 inches is required for application of spray applied polymer modified asphalt, **e.spray**. For areas with less than 24-inch clearance, the **e.spray** membrane may be applied by hand using **e.roll**.
- D. Overspray: Protect all adjacent areas not receiving **e.spray** or **e.roll**. Masking is necessary to prevent unwanted overspray from adhering to, or staining, areas not receiving the membrane. Once **e.spray** or **e.roll** adheres to a surface it is extremely difficult to remove.
- E. Weather Limitations: Perform work only when existing and forecast weather conditions are within manufacturer's recommendations.
 1. Spray Applied Polymer Modified Asphalt Membrane: Minimum ambient temperature must be 40°F (7°C) and rising. For applications temperatures below 38 degrees, but greater than +19°F/-7°C, special equipment and material handling is needed. Substrate shall be clean and free from standing moisture.

2. EPRO applicators reserve the right not to install product when application conditions might be within manufactures acceptance, but ambient conditions may limit a successful application.
3. Bentonite: Application of bentonite materials to damp surfaces is acceptable provided it is being installed over **e.spray**.

1.9 WARRANTY

- A. General Warranty: The special warranty specified in this section shall not deprive the owner of other rights the owner may have under other provisions of the contract documents, and shall be in addition to, and run concurrent with, other warranties made by the contractor under requirements of the contract documents.
- B. Special Warranty: Submit a written warranty signed by waterproofing manufacturer agreeing to replace system materials that do not conform with manufactures published specifications, or are deemed to be defective. Warranty does not include failure of waterproofing due to failure of soil substrate prepared and treated according to requirements or formation of new joints and cracks in the specially applied concrete that exceed 1/8 inch (3.175 mm) in width.
 1. Warranty Period: 5 years after date of substantial completion. Longer warranty periods are available upon request.
 2. Coverage: Manufacturer will guarantee that the material provided is free of defects for the warranty period.
- C. Additional Warranty Options: Upgraded warranties are available by contacting the manufacturer. These warranties may have additional requirements and approval must be granted in accordance to the manufacturer's warranty requirements. Additional warranty options include:
 1. Standard Labor and Material (E.Series L&M): Manufacturer will provide non-prorated coverage for the warranty term, agreeing to repair or replace material that does not meet requirements or remain watertight.
 2. No-Dollar-Limit Labor and Material Warranty (E.Assurance NDL): Manufacturer will provide a non-prorated, no-dollar-limit, coverage for the warranty term, agreeing to repair or replace material that does not meet requirements or remain watertight.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: EPRO Services, Inc. (EPRO), P.O. Box 347; Derby, KS 67037; Tel: (800) 882-1896; Email: Info@eproinc.com; Web: www.eproinc.com
- B. Cast-in-Place Walls: E.Protect Wall (95 mils) – **e.spray** (80 mils), **e.shield 115**, **e.drain 6000**

2.2 SYSTEM PHYSICAL PROPERTIES

- A. The physical properties listed in this section reflect testing on the entire composite system. Physical properties of the individual system composite can be found in Specification Section 2.3.

1. **E.Protect Wall** composite system consists of 80 mil layer of **e.spray** (polymer modified asphalt membrane), and **e.shield 115** (15 mil polyolefin protection layer). Designed to handle a wide variety of positive side wall conditions, while providing enhanced protection against common backfill materials.

PROPERTIES	TEST METHOD	VALUE
Tensile Strength	ASTM D412	1027.7 psi
Elongation	ASTM D412	664%
Adhesion to Concrete	ASTM D903	20.0 lbf/in
Puncture Resistance	ASTM D1709	57.2 lbf
Hydrostatic Head Resistance	ASTM D5385	100 psi (231 ft)
Water Vapor Transmission	ASTM E96	.0374 perms

2.3 WATERPROOFING MATERIALS

- A. Polymer Modified Asphalt

1. **e.spray**: **e.spray** is a non-hazardous, low-viscosity, water-based, anionic asphalt emulsion modified with a blend of synthetic polymerized rubbers and proprietary additives. **e.spray** is highly stable during transit and proper storage, but becomes highly reactive during the spray application to form a rapidly cured membrane with exceptional bonding, elongation, and hydrophobic characteristics.

PROPERTIES	TEST METHOD	VALUE
Color		Brown to Black
Solvent Content		No Solvents
Shelf Life		6 Months
Tensile Strength	ASTM D412	32 psi
Elongation	ASTM D412	4140%
Resistance to Decay	ASTM E154 Section 13	4% Perm Loss
Accelerated Aging	ASTM G23	No Effect
Moisture Vapor Transmission	ASTM E96	0.026 g/ft ² /hr
Hydrostatic Water Pressure	ASTM D751	26 psi
Perm Rating	ASTM E96	0.21 perms
Methane Transmission Rate	ASTM D1434	0
Adhesion to Concrete & Masonry	ASTM C836 & C704	20 lbf/inch
Adhesion to HDPE	ASTM C836	28.363 lbf/inch

Adhesion to Polypropylene Fabric	ASTM C836	31.19 lbf/inch
Hardness	ASTM C836	80
Crack Bridging	ASTM C836-00	No Cracking
Low Temp. Flexibility		No Cracking at -20° C
Packaging: 55 gallon drum, 275 gallon tote, 330 gallon tote		

2. **e.roll:** *e.roll* is a medium viscosity water-based, polymer-modified anionic asphalt emulsion, which exhibits exceptional bonding, elongation and waterproofing characteristics.

PROPERTIES	TEST METHOD	VALUE
Color		Brown to Black
Solvent Content		No Solvents
Shelf Life		6 Months
Tensile Strength	ASTM D412	32 psi
Elongation	ASTM D412	3860%
Resistance to Decay	ASTM E154 SECTION 13	9% Perm Loss
Accelerated Aging	ASTM G23	No Effect
Moisture Vapor Transmission	ASTM E96	0.071 g/ft ² /hr
Hydrostatic Water Pressure	ASTM D751	28 psi
Perm Rating	ASTM E96	0.17 perms
Methane Transmission Rate	ASTM D14334	0
Adhesion to Concrete & Masonry	ASTM C836	1 lbf/inch
Hardness	ASTM C836	85
Crack Bridging	ASTM C836	No Cracking
Low Temp. Flexibility	ASTM C836-00	No Cracking at -20° C
Packaging: 5 gallon bucket		

B. Polyolefin Sheet Membrane

1. **e.shield 115:** *e.shield 115* is a red 15 mil geomembrane made from a custom blend of polyolefin copolymers.

PROPERTIES	TEST METHOD	VALUE
Film Material		Polypropylene
Film Color		Red
Film Thickness		15 Mil
Classification	ASTM E1745	Class A, B & C
Water Vapor Permeance	ASTM F1249	0.0078 perms
Tensile Strength	ASTM D882	64 lbf./inch
Puncture Resistance	ASTM 1709	4000 grams
Life Expectancy	ASTM E154	Indefinite
Chemical Resistance	ASTM E154	Unaffected
Low Temp. Impact	ASTM D1790	Resistant to 105° C
Methane Gas Modified	ASTM D1434	252.55 GTR
ACI 302.1 R-96 Minimum Thickness 10-mils		Exceeds
Dimensions: 12' X 150'		
Weight: 144 pounds		

C. Prefabricated Drainage

1. **e.drain 6000:** *e.drain 6000* features a lightweight three-dimensional, high-compressive strength polypropylene core and bonded non-woven geotextile fabric. The bonded filter fabric allows water to pass freely into the molded drain while preventing soil particles from entering and clogging the core structure.

PROPERTIES	TEST METHOD	VALUE
DIMPLED CORE		
Core Material		Polypropylene
Color		Black
Dimple Height	ASTM D1777-96	0.4" (10.16 mm)
Compressive Strength	ASTM D6364-06	16,500 psf (790 kN/m ²)
Flow rate	ASTM D4716	21 gal/min/ft
FILTER FABRIC		
Grab Tensile	ASTM D4632-91	100 lbs
CBR Puncture resistance	ASTM D6241	250 lbs
Apparent Operating Size	ASTM D4751-99	70 sieve size (.0212 mm)
Water Flow Rate	ASTM D4491-99	140 gpm/ft ² (5704 l/min/m ²)
UV Resistance	ASTM D4355-92	70% (500 hrs)
Dimensions: 6' x 5'		
Weight: 63 pounds		

2. **e.drain 12ds:** *e.drain 12ds* features a lightweight three-dimensional, highly flexible polypropylene core and a non-woven geotextile filter fabric. The filter fabric is bonded to the dimples of the polypropylene core to prevent clogging within the drain.

PROPERTIES	TEST METHOD	VALUE
DIMPLED CORE		
Core Material		Polypropylene
Color		Black
Compressive strength	ASTM D1621	9,500 PSF (455 kN/m ²)
Thickness	ASTM D1777	1 Inch
Flow rate	ASTM D4716	30 gpm/ft of width
FILTER FABRIC		
CBR puncture	ASTM D6241	250 lbs
Grab tensile strength	ASTM D4632	100 lbs
AOS	ASTM D4751	70 U.S. sieve
Permitivity	ASTM D4491	2.0 sec ⁻¹
Flow rate	ASTM D4491	140 gpm/ft ²
UV resistance	ASTM D4355	70% (500 hrs)
Dimensions: 165' x 12" x 1"		
Weight: 65 pounds		

2.4 AUXILIARY MATERIALS

- A. General: All accessory products shall be provided by the specified waterproofing manufacturer. Auxiliary products used in lieu of, or in addition to, the manufacturer's products must be approved in writing by EPRO prior to installation.
- B. Reinforcement Fabric: Manufacturer's polyester fabric, **e.poly** is available in 6 inch, 12 inch, and 40 inch widths.
- C. Detailing Material: **e.roll**, a roller applied water based high viscosity polymer modified asphaltic material OR **e.trowel**, a trowel applied water based high viscosity polymer modified asphaltic material.
- D. Backer Rod: Closed cell polyethylene foam
- E. Water Stop: A double row **e.stop b** shall be placed at all cold joints, construction joints, penetrations, and steel beams in back lagged conditions. Water stop is not required at lift joints. A single row of **e.stop b** is acceptable at elevations above the design water table.
- F. Vertical Membrane Fastener: **e.hanger** with 3/4 inch washer
- G. Termination Bar: **e.term hd**, or approved alternate
- H. Shot Pins: Minimum 1-inch galvanized steel pins with 3/4 inch aluminum washer.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.1.2 SURFACE PREPARATION

- A. The general contractor shall engage the certified waterproofing contractor and certified inspector to ensure surfaces are prepared in accordance with manufacturer's instructions. Unless, explicitly stated in the contract documents, the waterproofing contractor is not responsible for surface preparation.
- B. Examine all substrates, areas, and conditions under which the composite membrane system will be installed, applicator and inspector must be present. Do not proceed with installation until unsatisfactory conditions have been corrected and a surface prep requirements have been met. If conditions exist that are not addressed in this section notify inspector and contact EPRO for additional clarification.

- C. Cast-in-Place or Shotcrete Walls: Application to green concrete is acceptable provided the substrate is prepared in accordance with manufacturers specifications and published instructions.
1. Provide a clean, dust-free, and dry substrate for waterproofing application.
 2. Surfaces shall be power washed to remove grease, oil, form release agents or any other penetrating contaminants from the concrete. No agents shall be visible prior to the application of **e.spray**.
 3. Remove all fins, ridges, and other protrusions.
 4. Fill honeycomb, aggregate pockets, tie holes, and other voids with hydraulic cement, or rapid-set grout.
- D. Precast Concrete Walls:
1. Provide a clean, dust-free, and dry substrate for waterproofing application.
 2. Surfaces shall be power washed to remove grease, oil, form release agents, or any other penetrating contaminants from the concrete. No agents shall be visible prior to the application of **e.spray**.
 3. Remove all fins, ridges, and other protrusions.
 4. Fill honeycomb, aggregate pockets, tie holes, and other voids with hydraulic cement, or rapid-set grout. All grout should be struck smooth and without pinholes.
 5. Fill precast panel and control joints with a suitable backer rod material and sealant approved by manufacturer.
 6. Apply **e.roll** 3 inches horizontally and 3 inches vertically around the base of the penetration, including **e.stop b**.
 7. Embed reinforcement fabric 3 inches horizontally and 3 inches vertically around the base of the penetration.
 8. 6-inch reinforcement fabric is acceptable for most penetrations, but soil nails, rock anchors, and tiebacks (non-hydrostatic) will require 12-inch reinforcement fabric.

3.2 POSITIVE SIDE CONCRETE WALL INSTALLATION – E.PROTECT WALL

- A. General: The composite membrane system shall be installed to the positive side vertical wall under strict accordance with the manufacture’s guideline and project specifications. This section describes the installation process for the system application to a freestanding cast-in-place concrete or shotcrete wall.
- B. Green Concrete: Application to green concrete is acceptable. Ambient temperatures, humidity, and concrete mix ratio can create blistering. If applying the system within 7 days of concrete placement contact manufacturer for further instruction.

3.2.2 TREATMENT OF CRACKS, JOINTS, AND REPAIRED AREAS

- A. Treat, rout, and fill cracks larger than 1/8 inch with hydraulic cement or rapid set grout.
- B. The following areas shall receive a reinforcement detail of **e.roll** and reinforcement fabric:
 1. All cracks less than 1/8 inch.

2. All previously repaired cracks.
 3. All cold joints.
- C. Reinforcement Detail: Apply a 30 mil coat of **e.roll** to desired area extending 3 inches beyond the joint or area of repair. Embed a joint reinforcing strip into the **e.roll**. Apply a second 30 mil coat of **e.roll** over **e.poly** reinforcement fabric ensuring full saturation.

3.2.3 DETAILING OF TRANSITIONS

- A. Corners: A reinforcement detail shall be applied to all transitions including all inside and outside corners, and all transitions from a horizontal to vertical planes.
- B. Underslab Transition: When the underslab composite membrane system transitions to a positive side concrete wall, the underslab system will terminate 2 feet above the slab to wall cold joint, or 2 feet above the design water table, whichever is greater.
- C. The underslab system will be fastened to the wall using **e.hanger**.
- D. Reinforcement Detail: Apply a 30 mil coat of **e.roll** to desired area extending 3 inches beyond the joint or area of repair. Embed a joint reinforcing strip into the **e.roll**. Apply a second 30 mil coat of **e.roll** over **e.poly** reinforcement fabric ensuring full saturation.

3.2.4 SEALING OF PENETRATIONS

- A. Standard Pipe Penetrations: Prepare membrane penetrations so they are free of any material that prohibit the material to bond directly to the penetration surface: foam, insulation, protective coatings, etc.
 1. Tightly wrap the penetration by pressing **e.stop b** firmly around the base of the penetration.
 2. Apply **e.roll** 3 inches horizontally and 3 inches vertically around the base of the penetration, including **e.stop b**.
 3. Embed **e.poly** reinforcement fabric 3 inches horizontally and 3 inches vertically around the base of the penetration.
 4. Apply a second layer of **e.roll** to the **e.poly** reinforcement fabric until the reinforcement fabric is fully saturated, and then secure the reinforcement fabric to the penetration with a cable tie.
 5. Cut a target piece of **e.poly** reinforcement fabric to the outside diameter of the penetration.
 6. Place target piece around the penetration and embed into existing saturated reinforcement fabric, saturate fabric with **e.roll**.

3.2.5 POLYMER MODIFIED ASPHALTIC MEMBRANE

- A. Mask off adjoining surfaces where unwanted **e.spray** polymer modified asphalt membrane may impact other construction trades.
- B. Commence application of **e.spray** when ambient air temperatures are within manufacturer recommendations.
- C. Surfaces that will receive **e.spray** must be sound, uniform, clean, and free from standing moisture.

- D. Start installing **e.spray** in presence of approved 3rd party inspector.
- E. Apply a 10 mil primer coat of un-catalyzed **e.spray** and allow to set. The primer coat is designed to reduce that amount of potential blistering that may occur as the concrete continues to release moisture.
- F. Moving from the low point to the high point of the wall, apply one application of **e.spray** in accordance with manufacturer's instructions in order to obtain a seamless membrane with a minimum dry film thickness of 80 mils (2 mm).
- G. Apply **e.spray/e.roll** in and around penetrations and cavities to ensure the formation of monolithic seal around all penetrations.
- H. Apply **e.spray/e.roll** to prepared wall terminations and vertical surfaces to heights indicated according to manufacturer's recommendations and details. (if applicable)
- I. Verify film thickness of **e.spray** every 1000 ft² (93 m²).

3.2.6 POLYOLEFIN PROTECTION COURSE

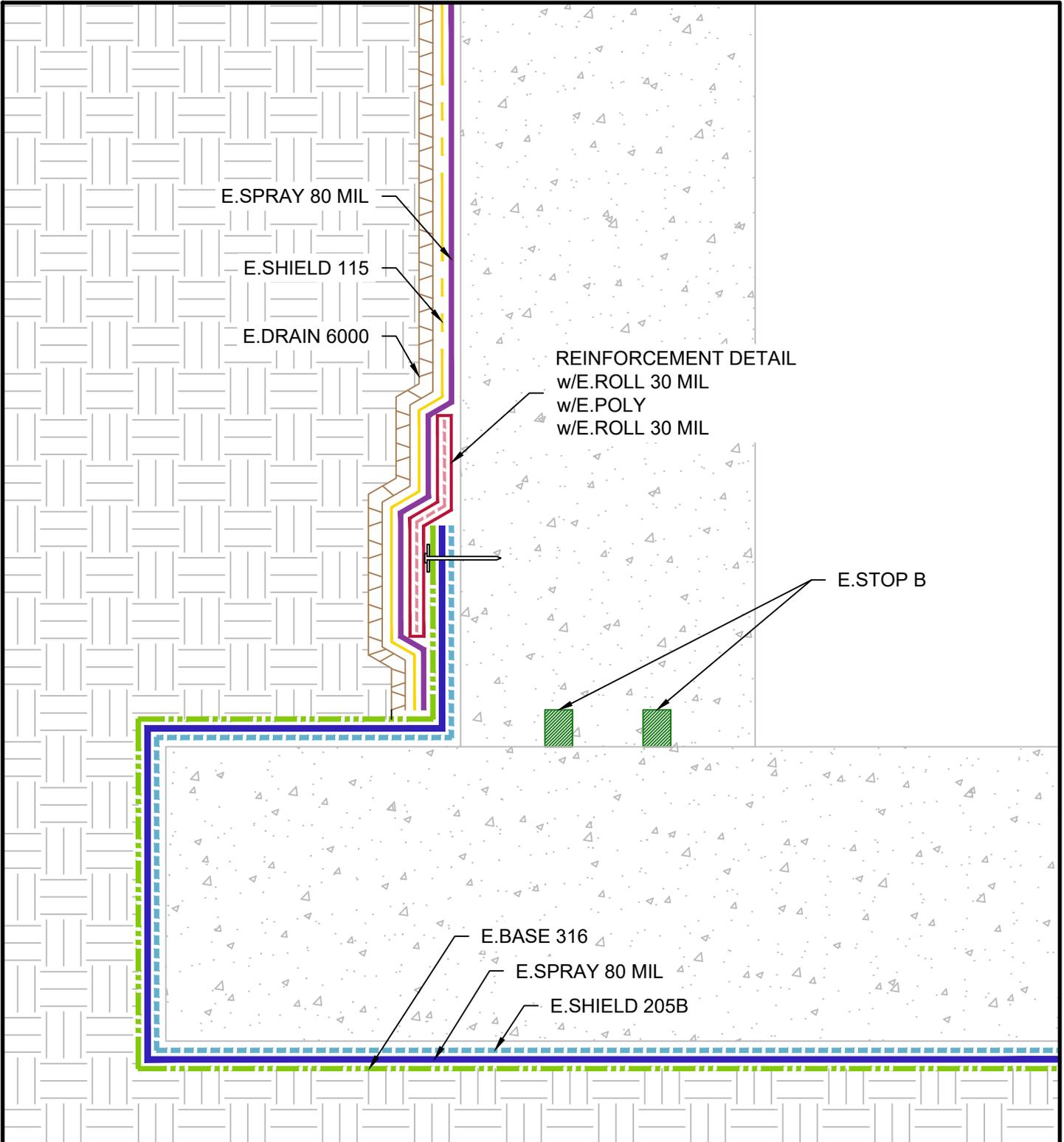
- A. Install **e.shield 115** protection course vertically or horizontally, either way is acceptable.
- B. Overlap **e.shield 115** seams a minimum 6 inches.
- C. Secure **e.shield 115** to **e.spray** with Sta'-Put Quick Grip LVOC spray adhesive, or approved alternate.
- D. Secure **e.shield 115** protection course seams with **e.tape**.

3.2.7 PREFABRICATED DRAINAGE MAT

- A. Horizontal Installation: Starting from one corner, run **e.drain 6000** horizontally along the base of the foundation.
 - 1. Secure drainage panels to the wall by using approved adhesives, adhesive strips, or fastened with shot pins or as recommended by manufacturer.
 - 2. Install the next layer of **e.drain 6000** in the same manner and overlap the next layer of drain mat 6 inches over the first layer of drain mat, thus creating a "shingle" effect. Continue this process to the top of the wall.
 - 3. Terminate the drainage and membrane system using a termination bar and a reinforcement detail.
 - 4. Care shall be taken when backfilling against the membrane in order to prevent any damage during the backfill process. Angular rock 1 inch or greater shall not be used without written approval from the manufacturer.
 - 5. Backfill in lifts, taking precaution to not backfill above the previously placed **e.drain 6000**.
- B. Vertical Installation: Starting from the top of wall, install **e.drain 6000** from the top of the wall to the base of the foundation.
 - 1. Overlap each roll of **e.drain 6000** 6 inches on all overlaps.
 - 2. Secure drainage composite panels to the wall by using by pressing drainage composite onto previously washered stick pins. Secure drainage composite by placing another stick pin washer over the drainage composite.

3. Secure **e.drain 6000** with a termination bar at the top of grade and no greater than 3 inches from the top of the drain.
 4. Secure **e.drain 6000** using approved adhesives.
- C. Geocomposite Strip Drain: If using **e.drain 12ds**, secure strip drain at the bottom of the footing or just above the design water table.
- D. Do not penetrate or damage the composite membrane system once it has been applied. If the system is penetrated or damaged, contact the applicator immediately. Failure to bring the breach of the system to the applicator's attention and not allowing adequate time to make the necessary repair will result in voiding any warranty.
- 3.2.8 TERMINATION AT TOP OF GRADE
- A. Termination at the top of grade shall be done with using at termination bar. Secure the termination bar every 12 inches on center and the center a reinforcement detail on the termination bar.
 - B. Reinforcement Detail - Apply a 30 mil coat of **e.roll** to desired area extending 3 inches beyond the joint or area of repair. Embed a joint reinforcing strip into the **e.roll**. Apply a second 30 mil coat of **e.roll** over **e.poly** reinforcement fabric ensuring full saturation.
- 3.3 FIELD QUALITY CONTROL
- A. Independent inspectors and certified applicators shall document the amount of **e.spray** used and document quantities in the inspection report.
- 3.4 CURING PROTECTING AND CLEANING
- A. Allow for **e.spray** to fully bond with the substrate, generally this occurs 24 to 48 hours after application depending on ambient weather conditions.
 - B. Take care to prevent contamination and damage during application stages and curing. All machinery, other trades, and general construction, shall NOT take place over the membrane until inspection is complete and concrete has been placed.
 - C. Prevent damage during the placement of overburden.
- 3.5 REPAIRS
- A. Concrete Walls:
 1. Inspect damaged area to determine which system components have been damaged.
 2. Only patch the areas that have been damaged by re-installing the damaged materials. The patch should extend 6 inches beyond the damaged area.

End of Section



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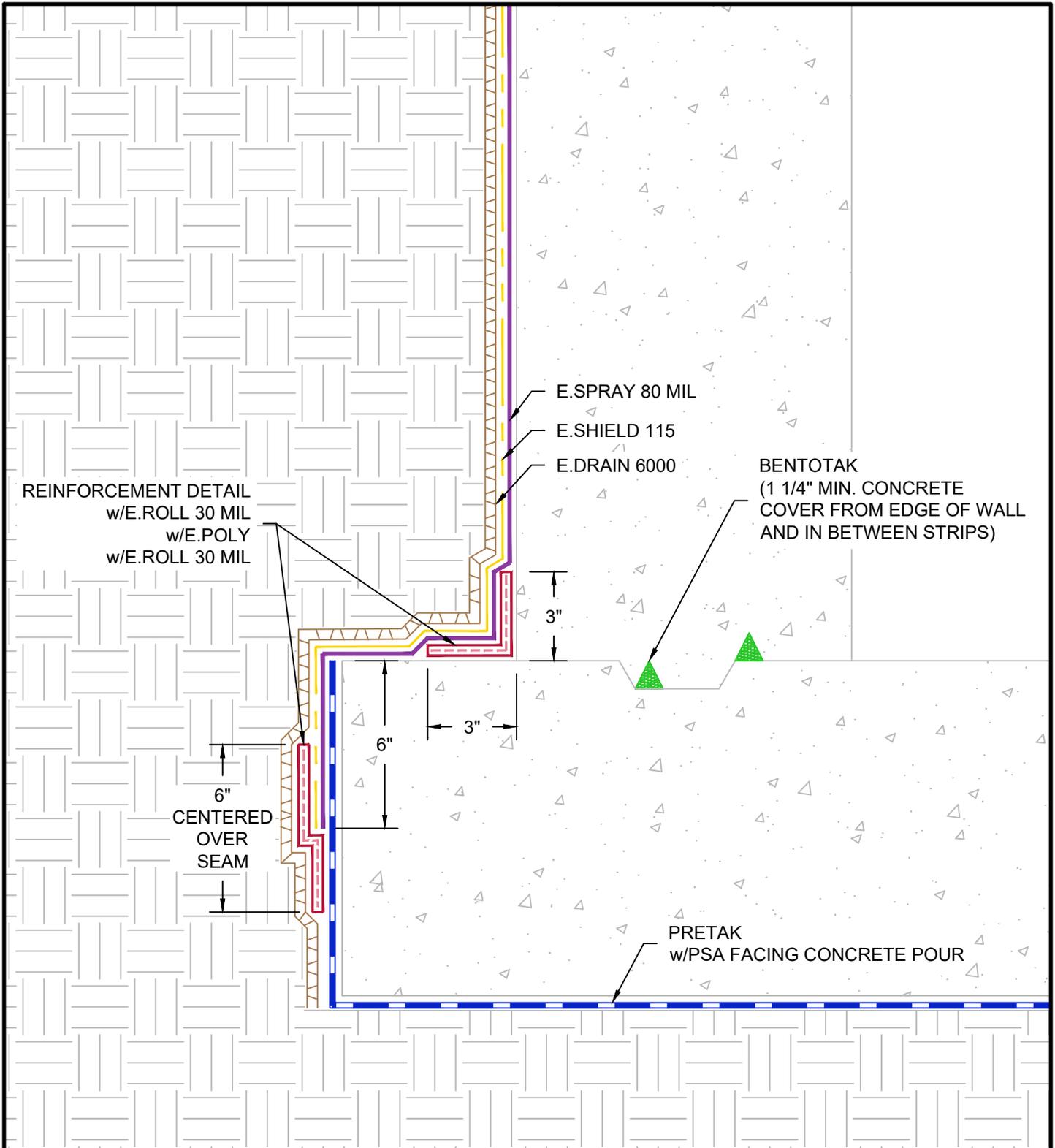
E.PROTECT+ UNDERSLAB ASSEMBLY TRANSITION TO E.PROTECT WALL ASSEMBLY - OFFSET

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	DRAFTER	DATE	
	RJT	7/07/2021	

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UNDERSLAB ASSEMBLY - OFFSET SLAB TRANSITION - E.PROTECT WALL ASSEMBLY (OPTION 2)

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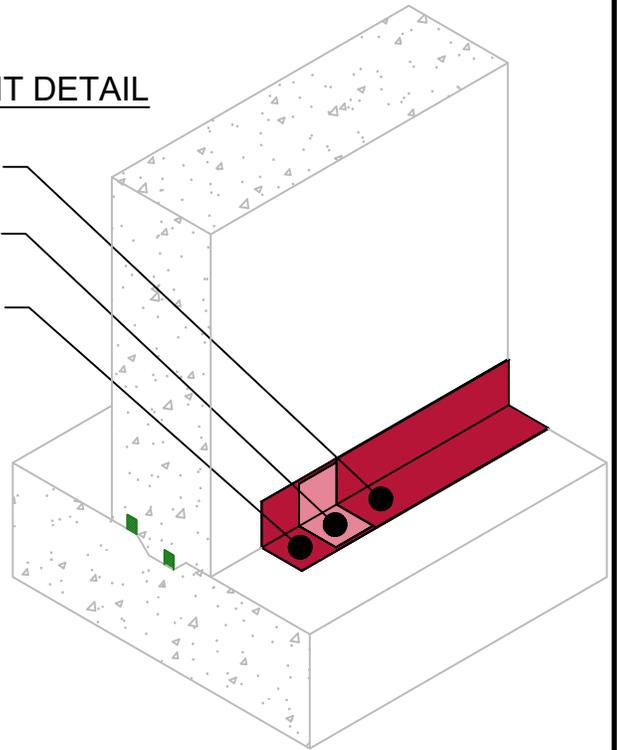
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REINFORCEMENT DETAIL

E.ROLL 30 MIL

EPOLY

E.ROLL 30 MIL

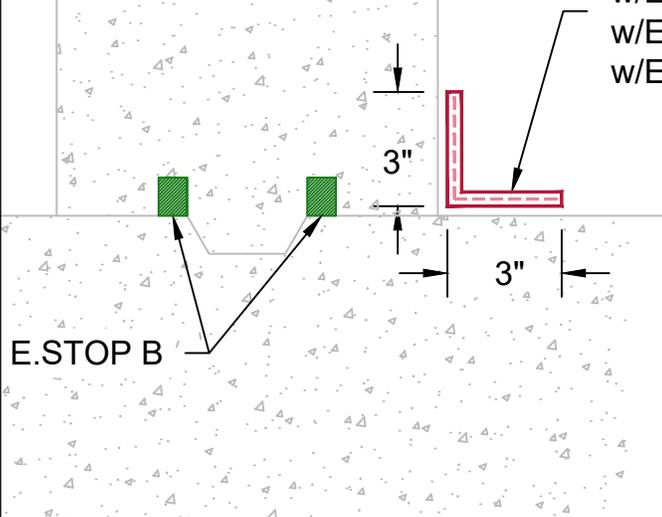


REINFORCEMENT DETAIL

w/E.ROLL 30 MIL

w/E.POLY

w/E.ROLL 30 MIL



E.STOP B

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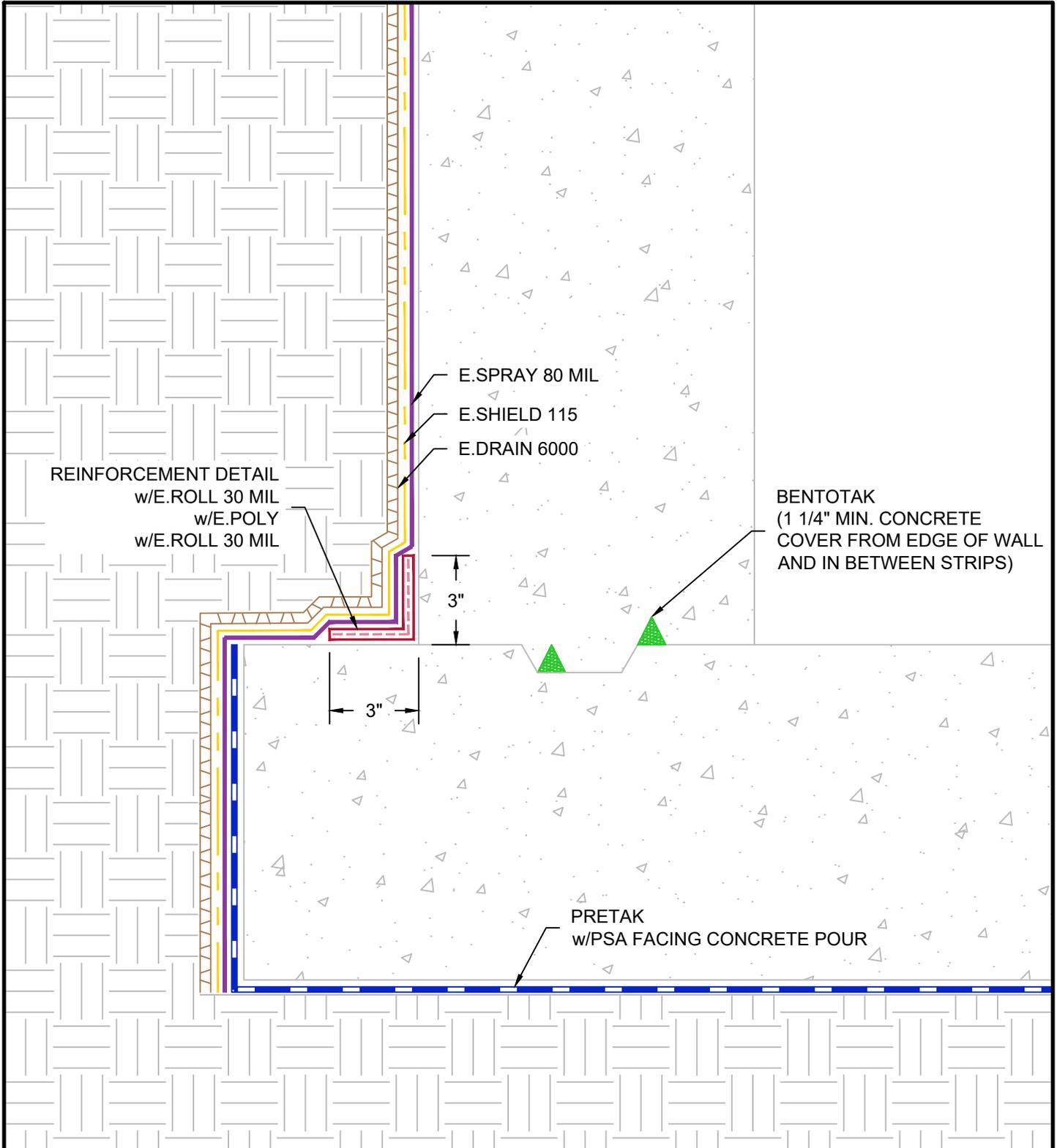
WALL TO FOOTING COLD JOINT

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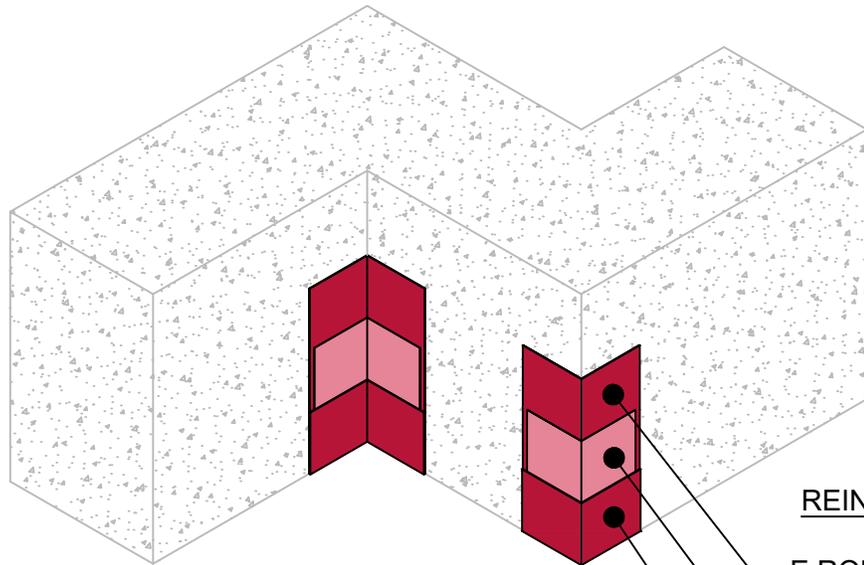
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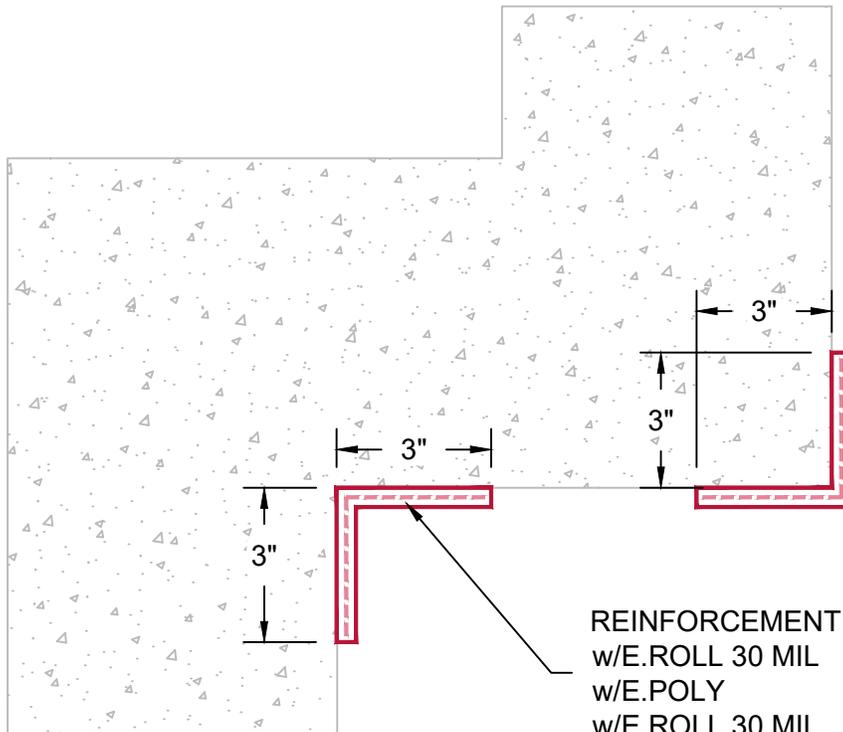


REINFORCEMENT DETAIL

E.ROLL 30 MIL

EPOLY

E.ROLL 30 MIL



REINFORCEMENT DETAIL

w/E.ROLL 30 MIL

w/E.POLY

w/E.ROLL 30 MIL

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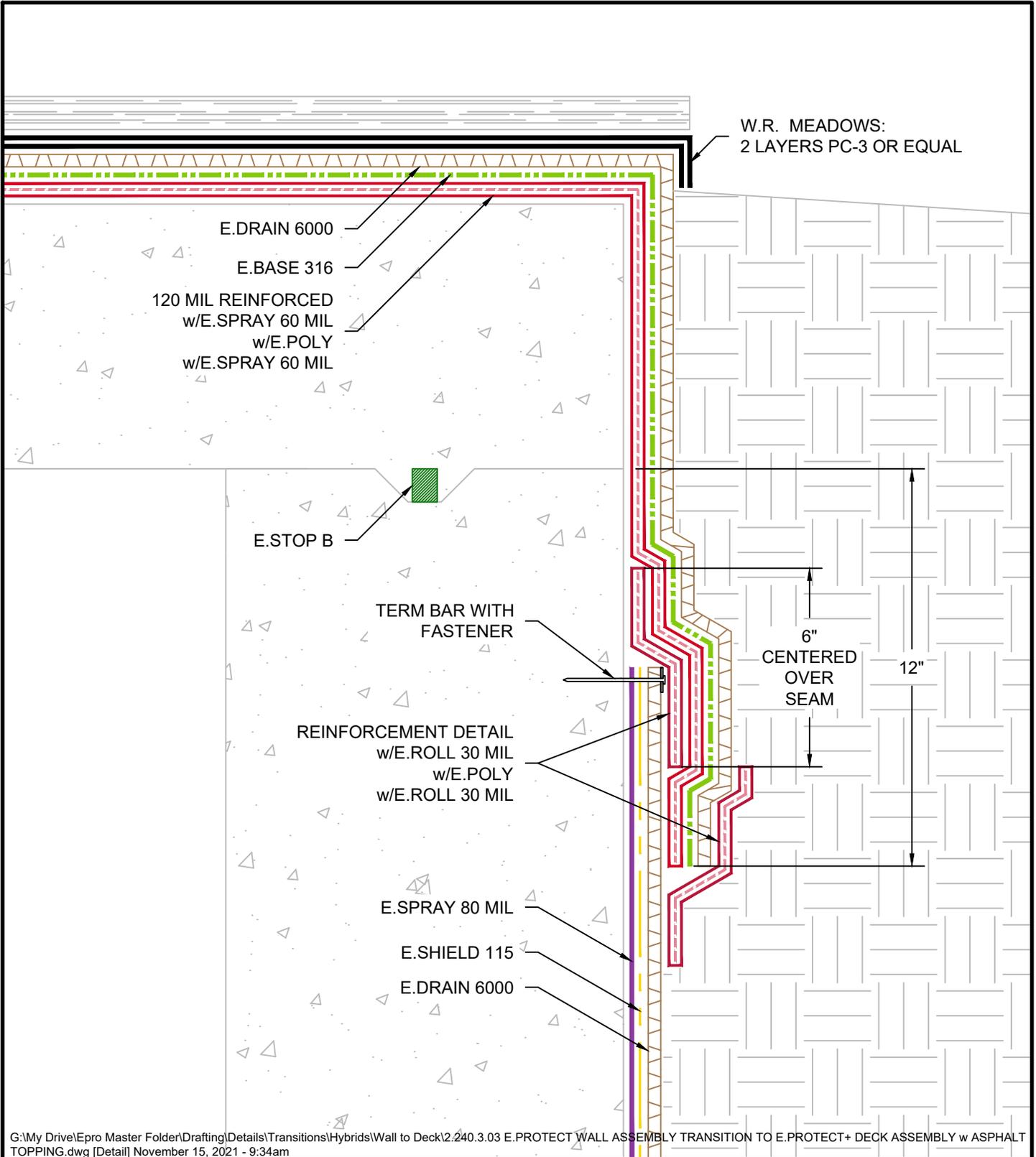
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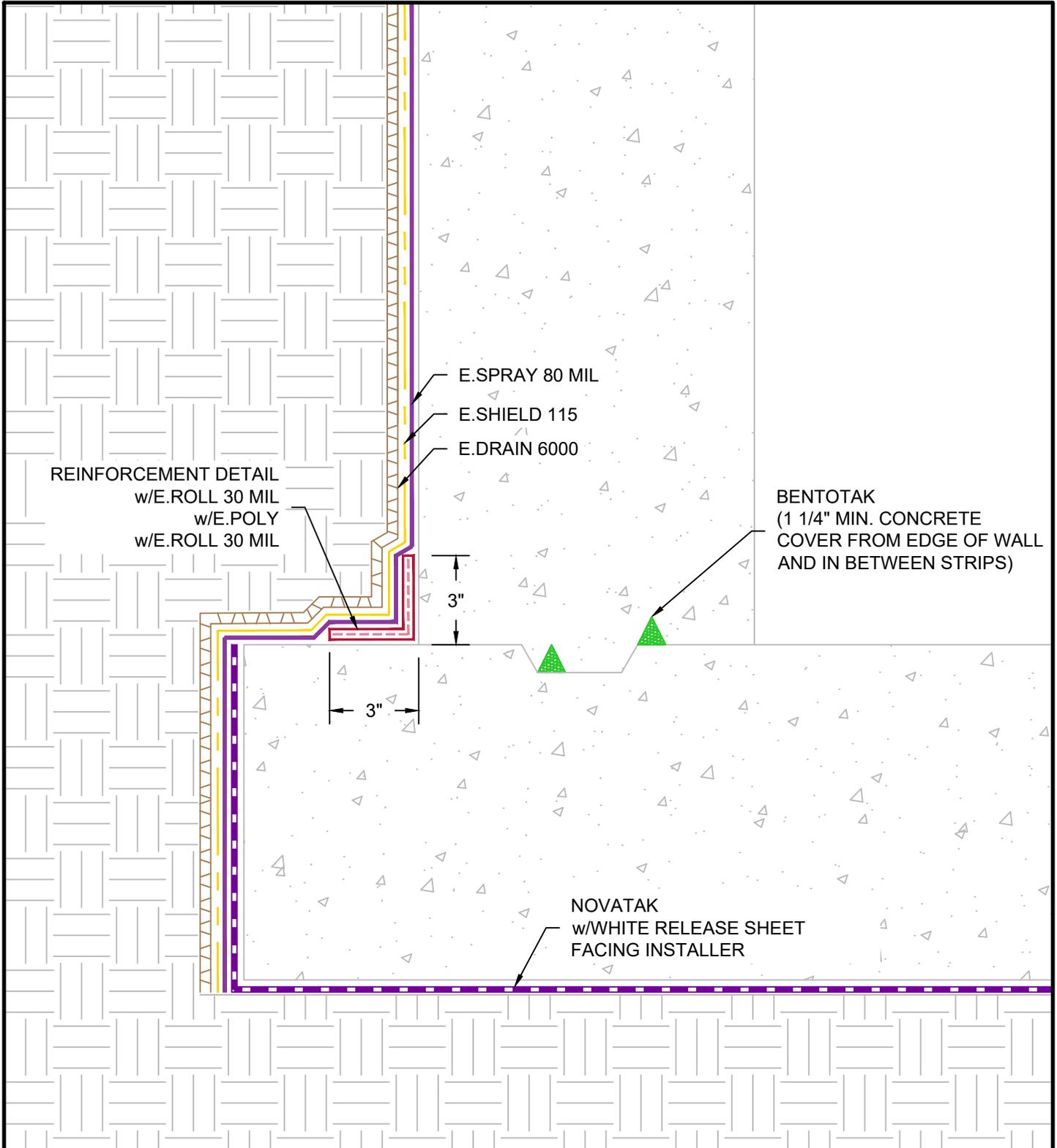


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E.PROTECT WALL ASSEMBLY TRANSITION TO E.PROTECT+ DECK ASSEMBLY w/ASPHALT TOPPING

	SYSTEM NAME	DRAWING NUMBER	
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	DRAFTER	DATE	
	RJT	10/25/2021	

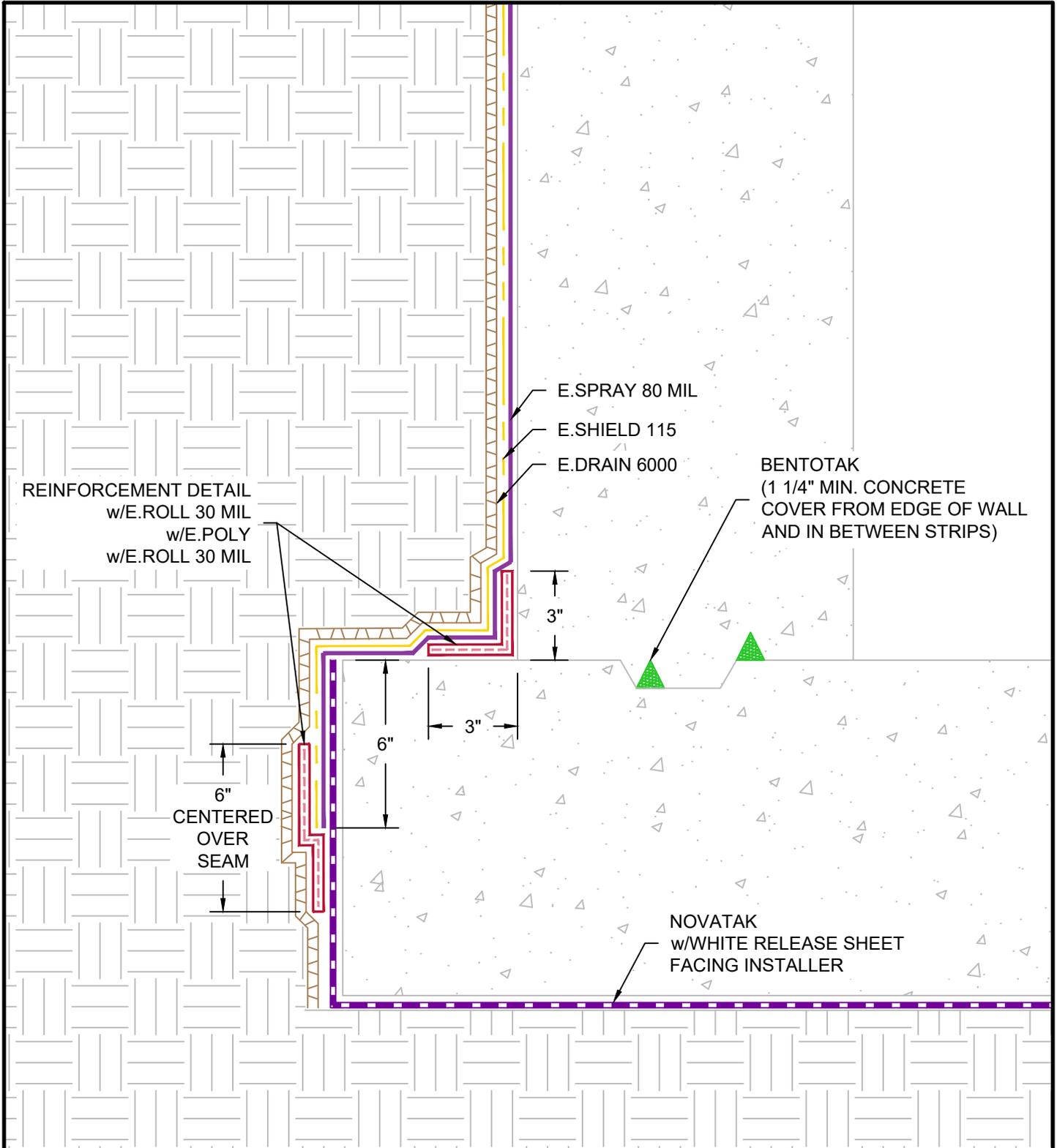
AS A SUPPLIER OF FINISHED PRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.



G:\My Drive\Epro Master Folder\Drafting\Details\Transitions\Hybrids\Underslab to Wall\50.144.1.1.02 UNDERSLAB ASSEMBLY - OFFSET SLAB TRANSITION - E.PROTECT WALL ASSEMBLY (OPTION 1).dwg [Detail] July 07, 2021 - 3:23pm

UNDERSLAB ASSEMBLY - OFFSET SLAB TRANSITION - E.PROTECT WALL ASSEMBLY (OPTION 1)			
	SYSTEM NAME	DRAWING NUMBER	 
	NOVATAK	50.144.1.1.02	
	DRAFTER	DATE	
	RJT	7/07/2021	

AS A SUPPLIER OF FINISHED RPRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.



G:\My Drive\Epro Master Folder\Drafting\Details\Transitions\Hybrids\Underslab to Wall\50.144.1.2.02 UNDERSLAB ASSEMBLY - OFFSET SLAB TRANSITION - E.PROTECT WALL ASSEMBLY (OPTION 2).dwg [Detail] July 07, 2021 - 3:22pm

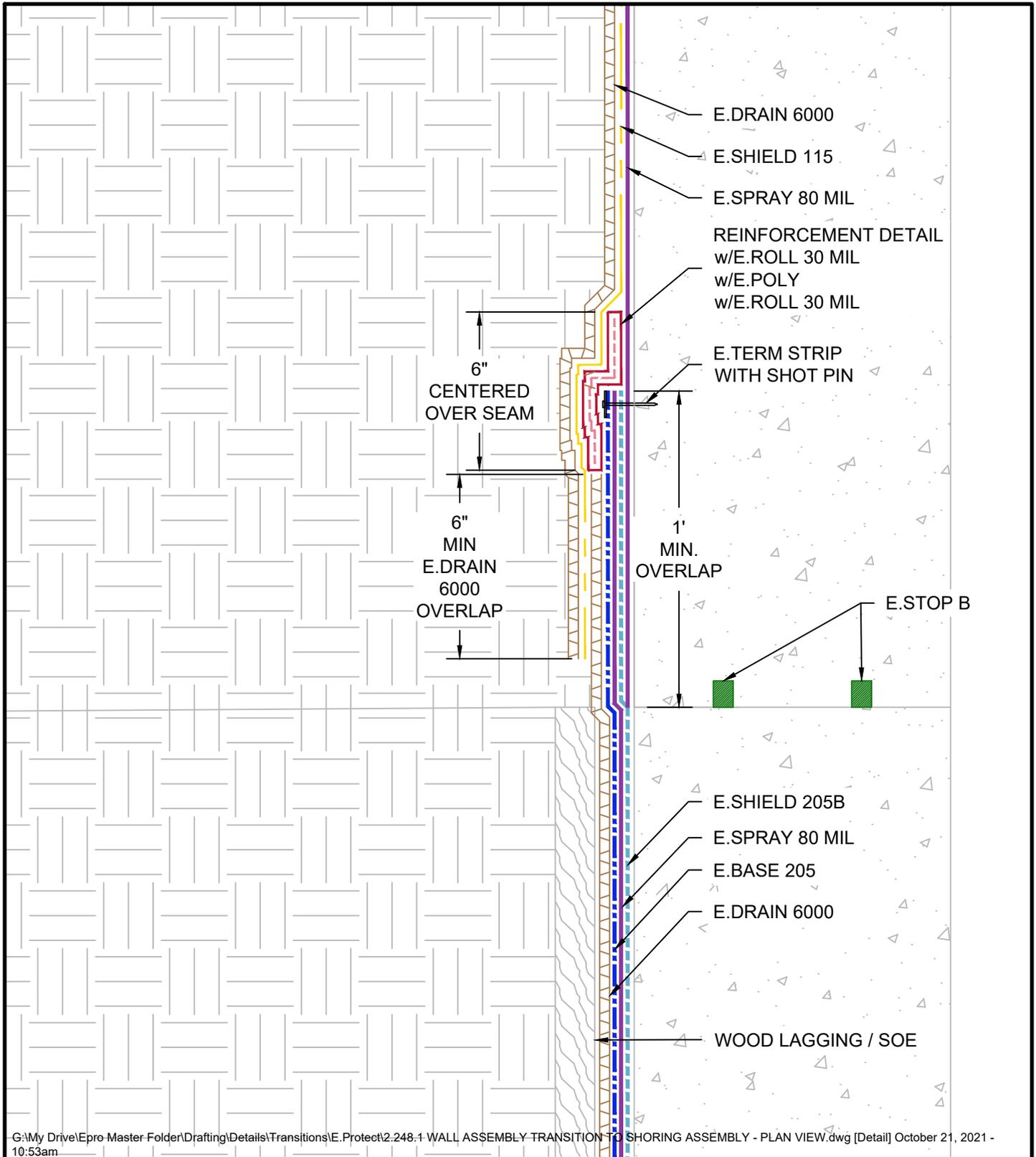
UNDERSLAB ASSEMBLY - OFFSET SLAB TRANSITION - E.PROTECT WALL ASSEMBLY (OPTION 2)

	SYSTEM NAME	DRAWING NUMBER	 
	NOVATAK / E.SERIES	50.144.1.2.02	
	DRAFTER	DATE	
	RJT	7/07/2021	

AS A SUPPLIER OF FINISHED RPRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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G:\My Drive\Epro Master Folder\Drafting\Details\Transitions\E.Protect\2.248.1 WALL ASSEMBLY TRANSITION TO SHORING ASSEMBLY - PLAN VIEW.dwg [Detail] October 21, 2021 - 10:53am

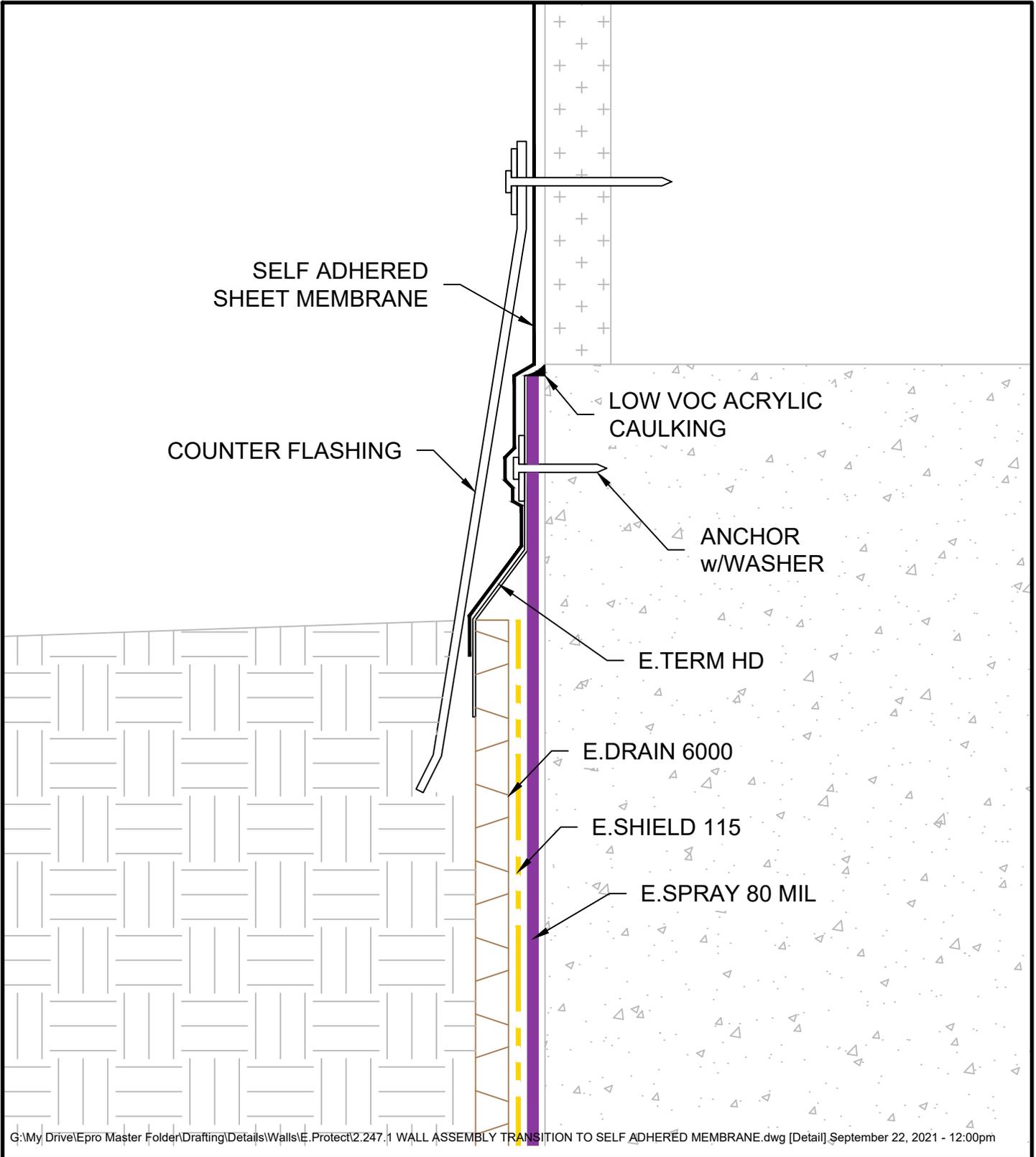
WALL ASSEMBLY TRANSITION TO SHORING ASSEMBLY - PLAN VIEW

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT	2.248.1	
	DRAFTER	DATE	
	RJT	10/21/2021	

AS A SUPPLIER OF FINISHED PRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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G:\My Drive\Epro Master Folder\Drafting\Details\Walls\E.Protect\2.247.1 WALL ASSEMBLY TRANSITION TO SELF ADHERED MEMBRANE.dwg [Detail] September 22, 2021 - 12:00pm

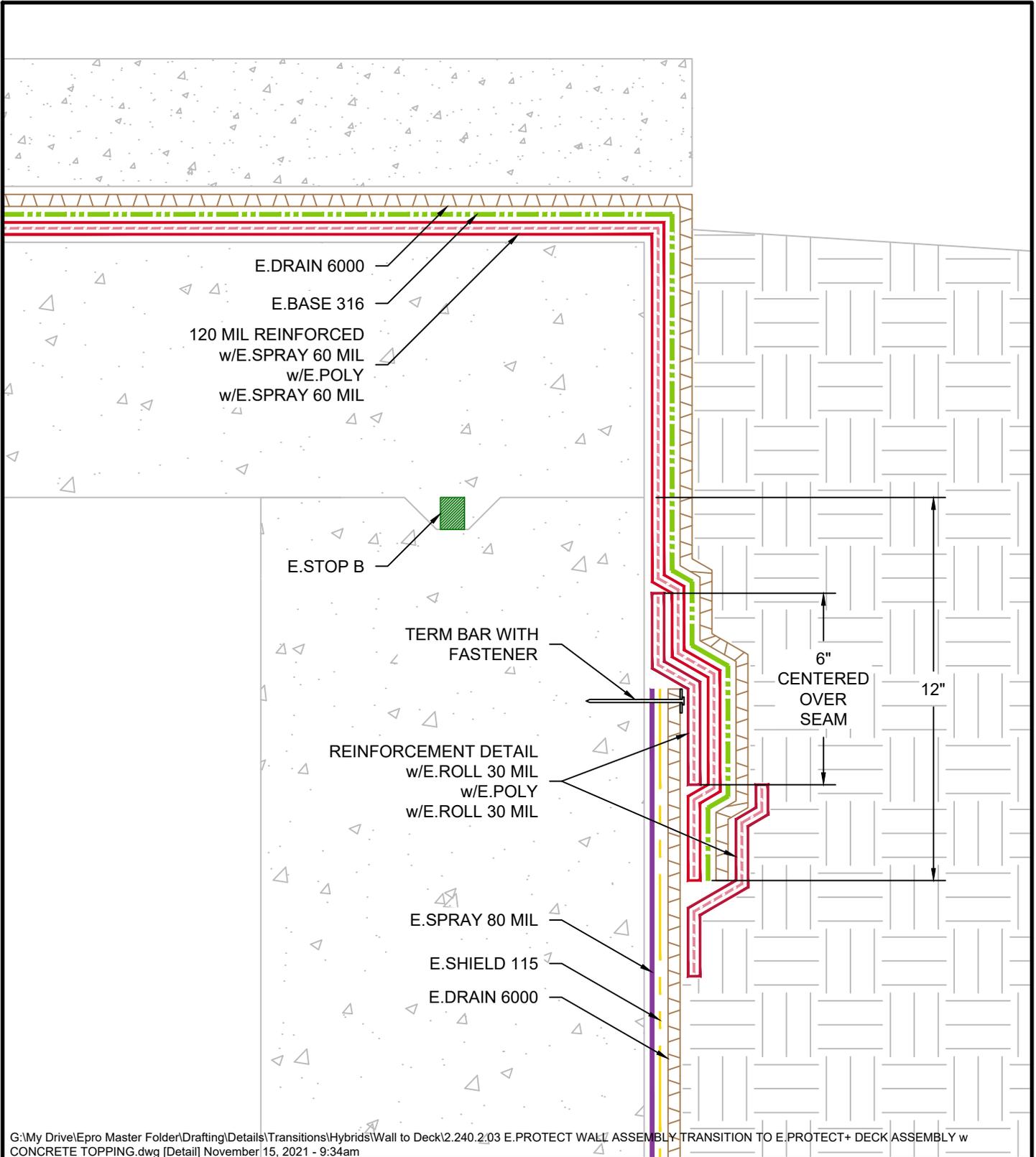
WALL ASSEMBLY TERMINATION TRANSITION TO SELF ADHERED MEMBRANE

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT	2.247.1	
	DRAFTER	DATE	
	RJT	9/22/2021	

AS A SUPPLIER OF FINISHED PRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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E.PROTECT WALL ASSEMBLY TRANSITION TO E.PROTECT+ DECK ASSEMBLY w/CONCRETE TOPPING

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT / E.PROTECT+	2.240.2.03	
	DRAFTER	DATE	
	RJT	10/25/2021	

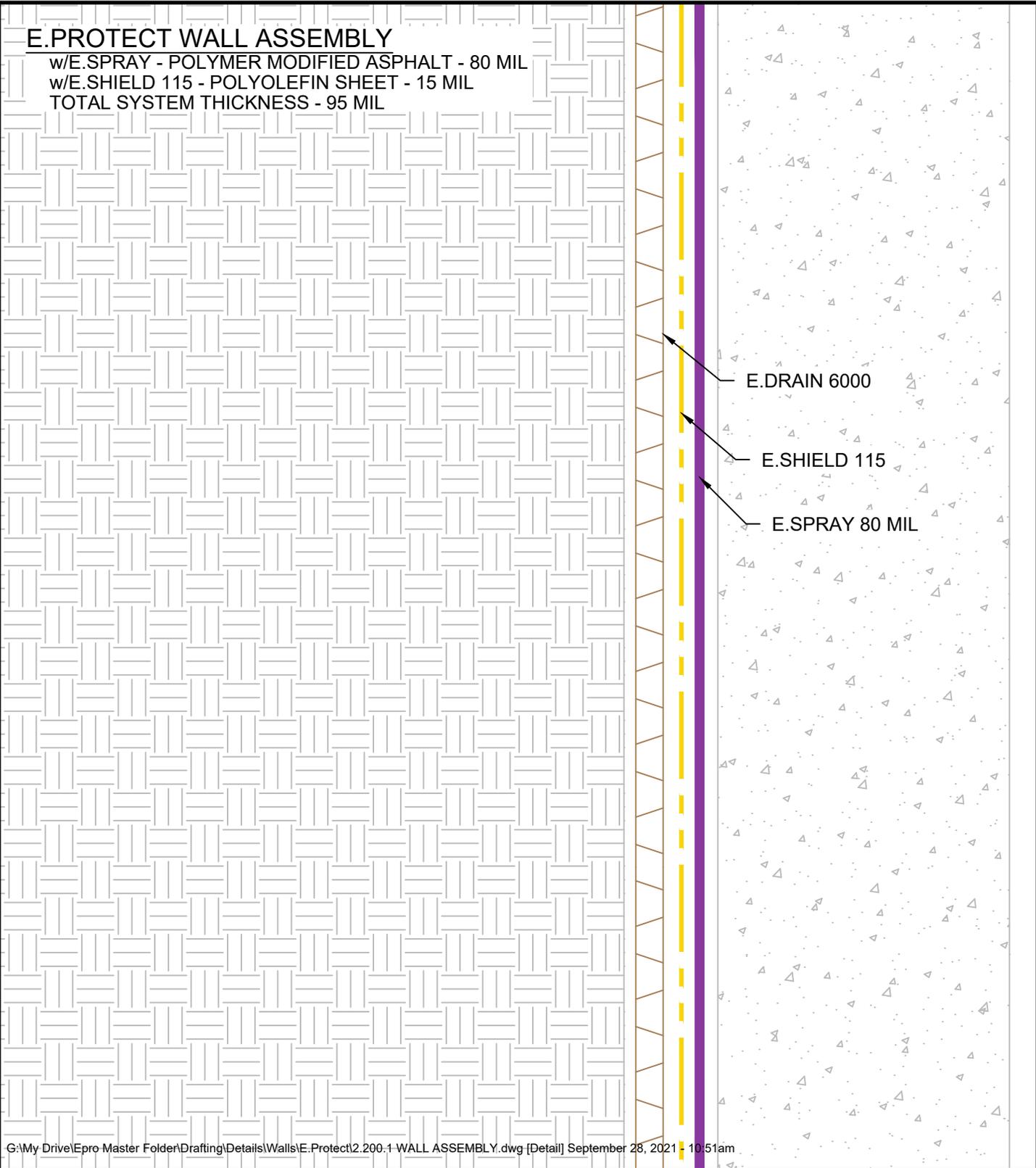
AS A SUPPLIER OF FINISHED RPRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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E.PROTECT WALL ASSEMBLY

w/E.SPRAY - POLYMER MODIFIED ASPHALT - 80 MIL
w/E.SHIELD 115 - POLYOLEFIN SHEET - 15 MIL
TOTAL SYSTEM THICKNESS - 95 MIL



E.DRAIN 6000

E.SHIELD 115

E.SPRAY 80 MIL

G:\My Drive\Epro Master Folder\Drafting\Details\Walls\E.Protect\2.200.1 WALL ASSEMBLY.dwg [Detail] September 28, 2021 10:51am

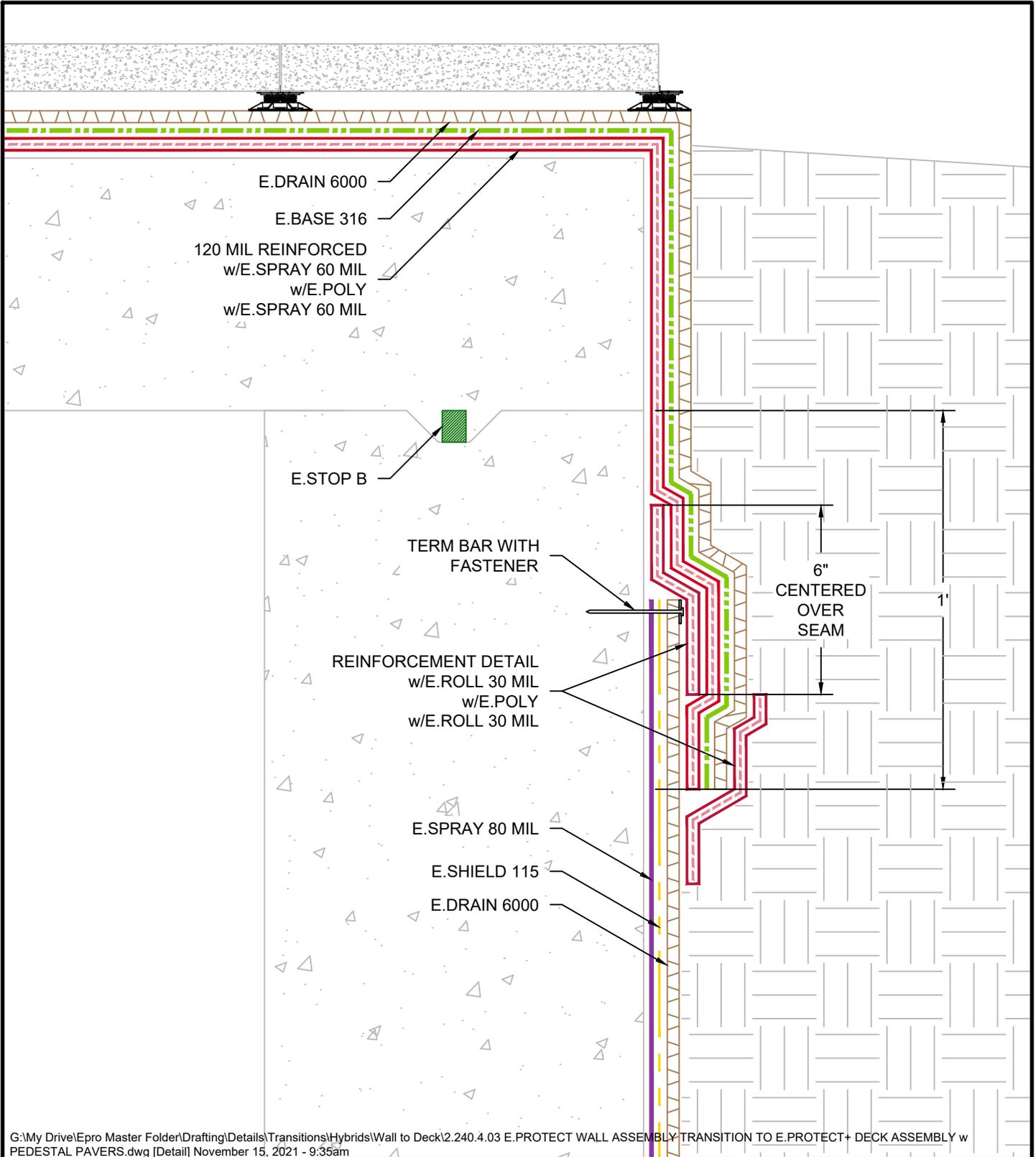
WALL ASSEMBLY

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT	2.200.1	
	DRAFTER	DATE	
	RJT	09/28/2021	

AS A SUPPLIER OF FINISHED RPRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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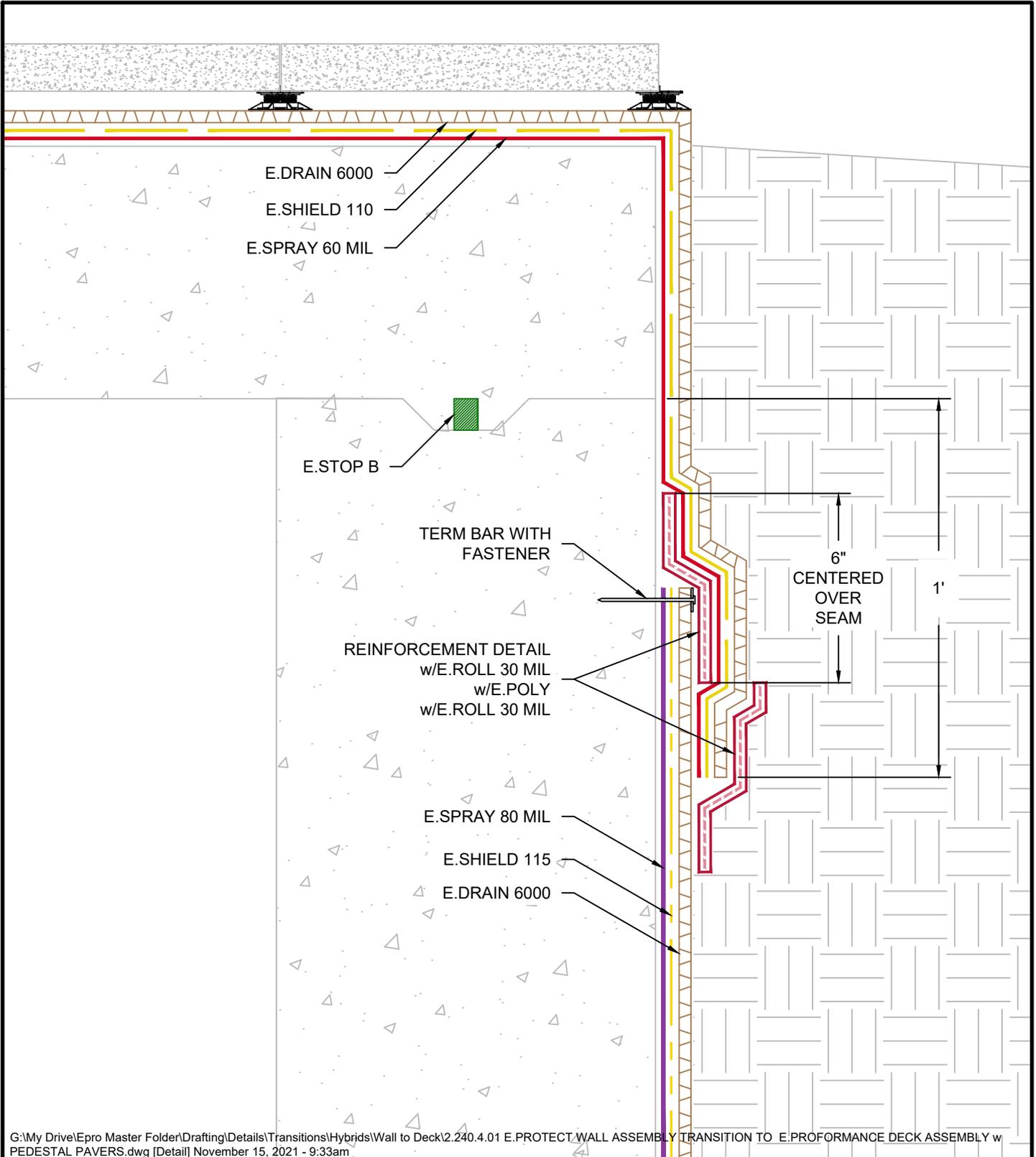
E.PROTECT WALL ASSEMBLY TRANSITION TO E.PROTECT+ DECK ASSEMBLY w/PEDESTAL PAVERS

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT / E.PROTECT+	2.240.4.03	
	DRAFTER	DATE	
	RJT	10/25/2021	

AS A SUPPLIER OF FINISHED PRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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G:\My Drive\Epro Master Folder\Drafting\Details\Transitions\Hybrids\Wall to Deck\2.240.4.01 E.PROTECT WALL ASSEMBLY TRANSITION TO E.PROFORMANCE DECK ASSEMBLY W PEDESTAL PAVERS.dwg [Detail] November 15, 2021 - 9:33am

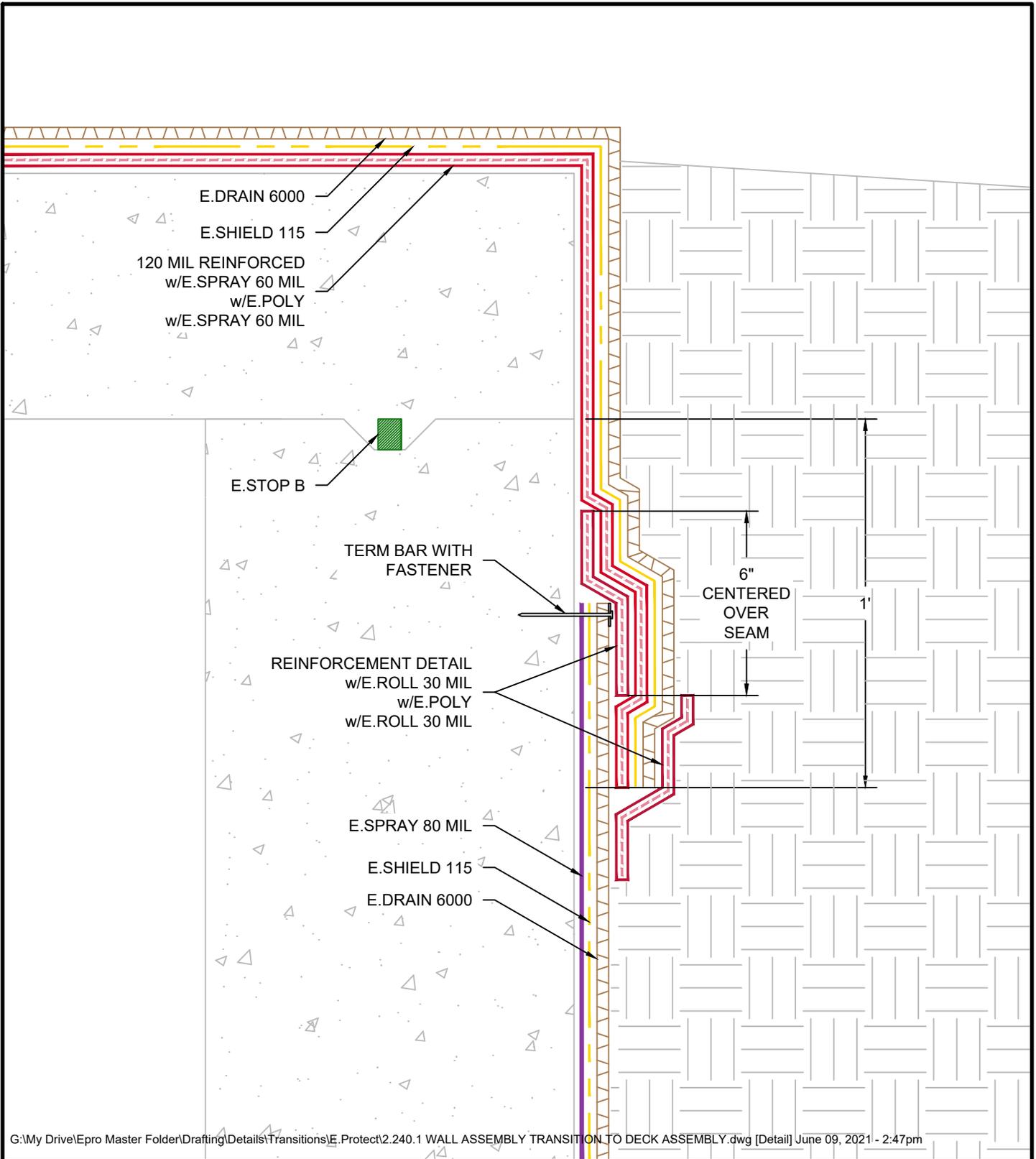
E.PROTECT WALL ASSEMBLY TRANSITION TO E.PROFORMANCE DECK ASSEMBLY W/PEDESTAL PAVERS

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT / E.PROFORMANCE	2.240.4.01	
	DRAFTER	DATE	
	RJT	10/25/2021	

AS A SUPPLIER OF FINISHED PRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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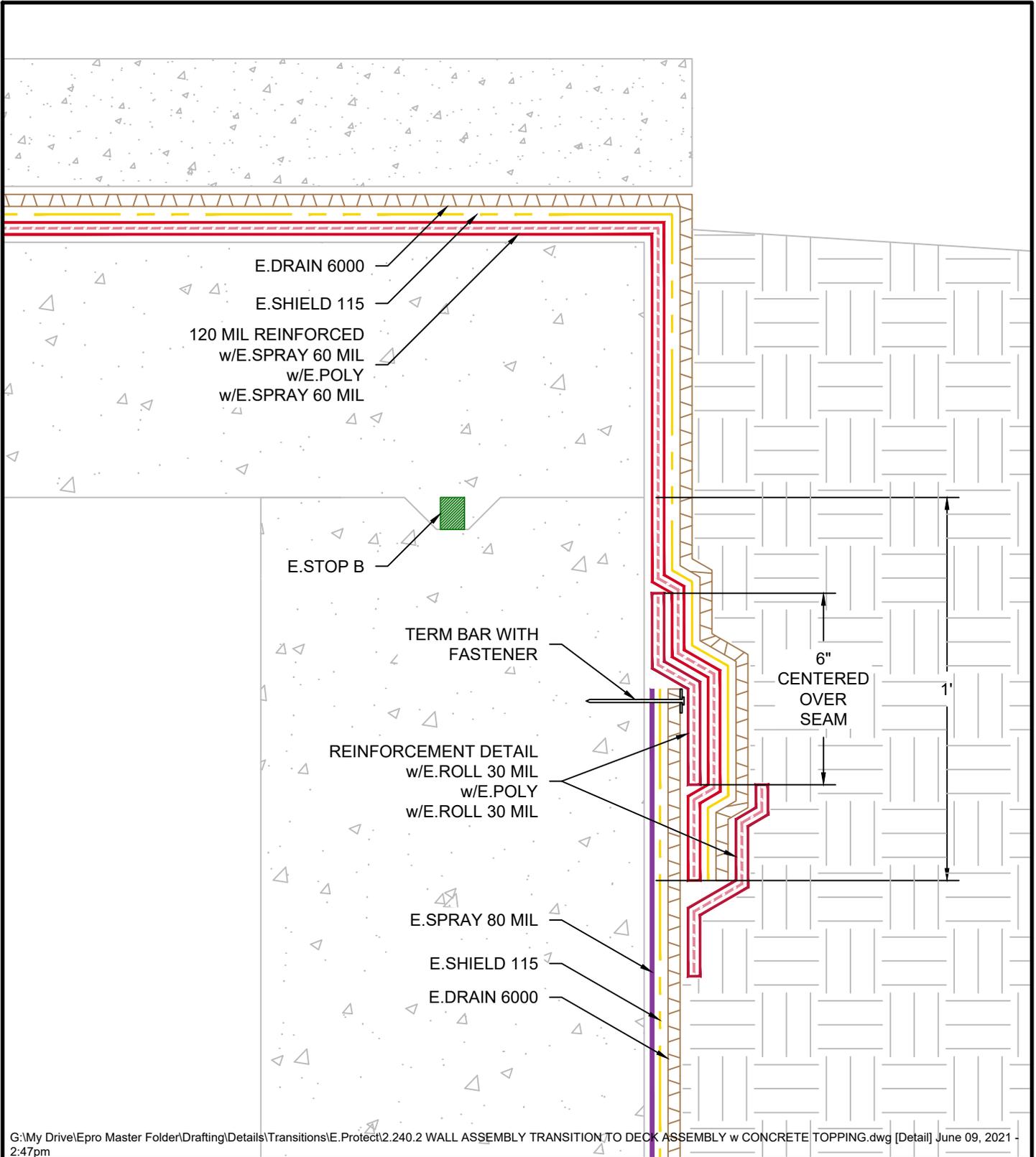
WALL ASSEMBLY TRANSITION TO DECK ASSEMBLY

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT	2.240.1	
	DRAFTER	DATE	
	RJT	4/07/2021	

AS A SUPPLIER OF FINISHED PRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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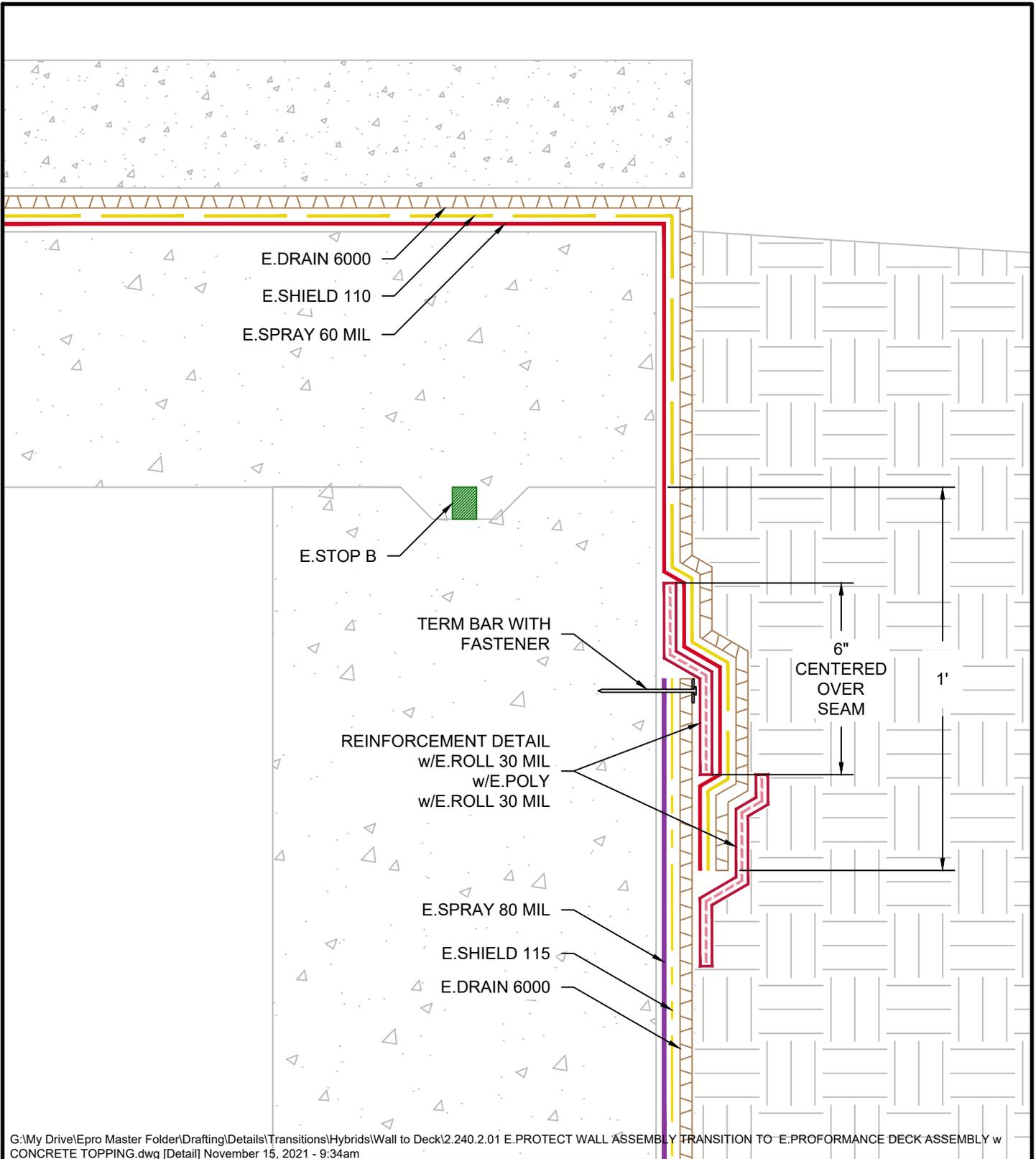
WALL ASSEMBLY TRANSITION TO DECK ASSEMBLY w/CONCRETE TOPPING

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT	2.240.2	
	DRAFTER	DATE	
	RJT	04/07/2021	

AS A SUPPLIER OF FINISHED RPRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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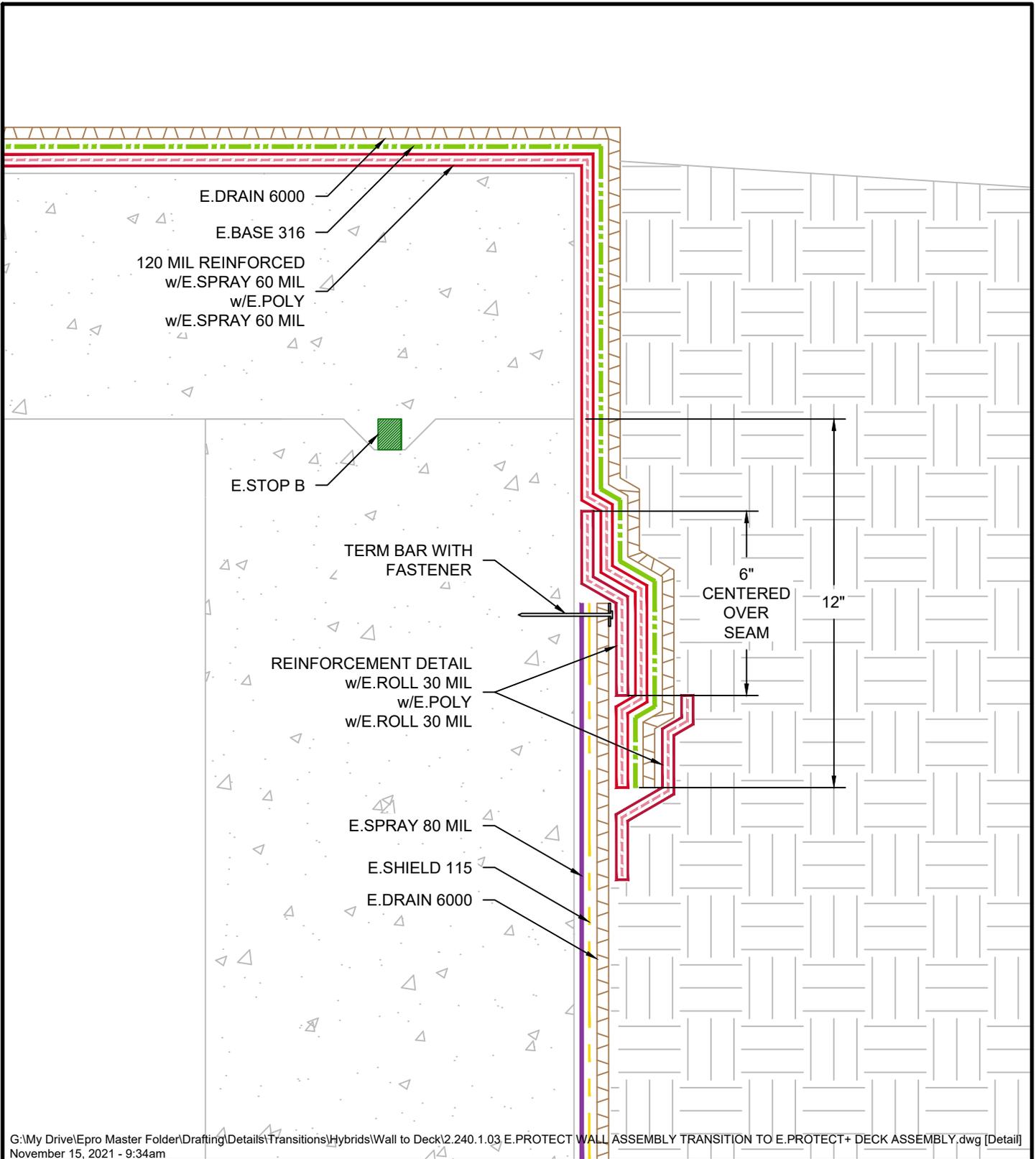
E.PROTECT WALL ASSEMBLY TRANSITION TO E.PROFORMANCE DECK ASSEMBLY w/CONCRETE TOPPING

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT / E.PROFORMANCE	2.240.2.01	
	DRAFTER	DATE	
	RJT	10/25/2021	

AS A SUPPLIER OF FINISHED PRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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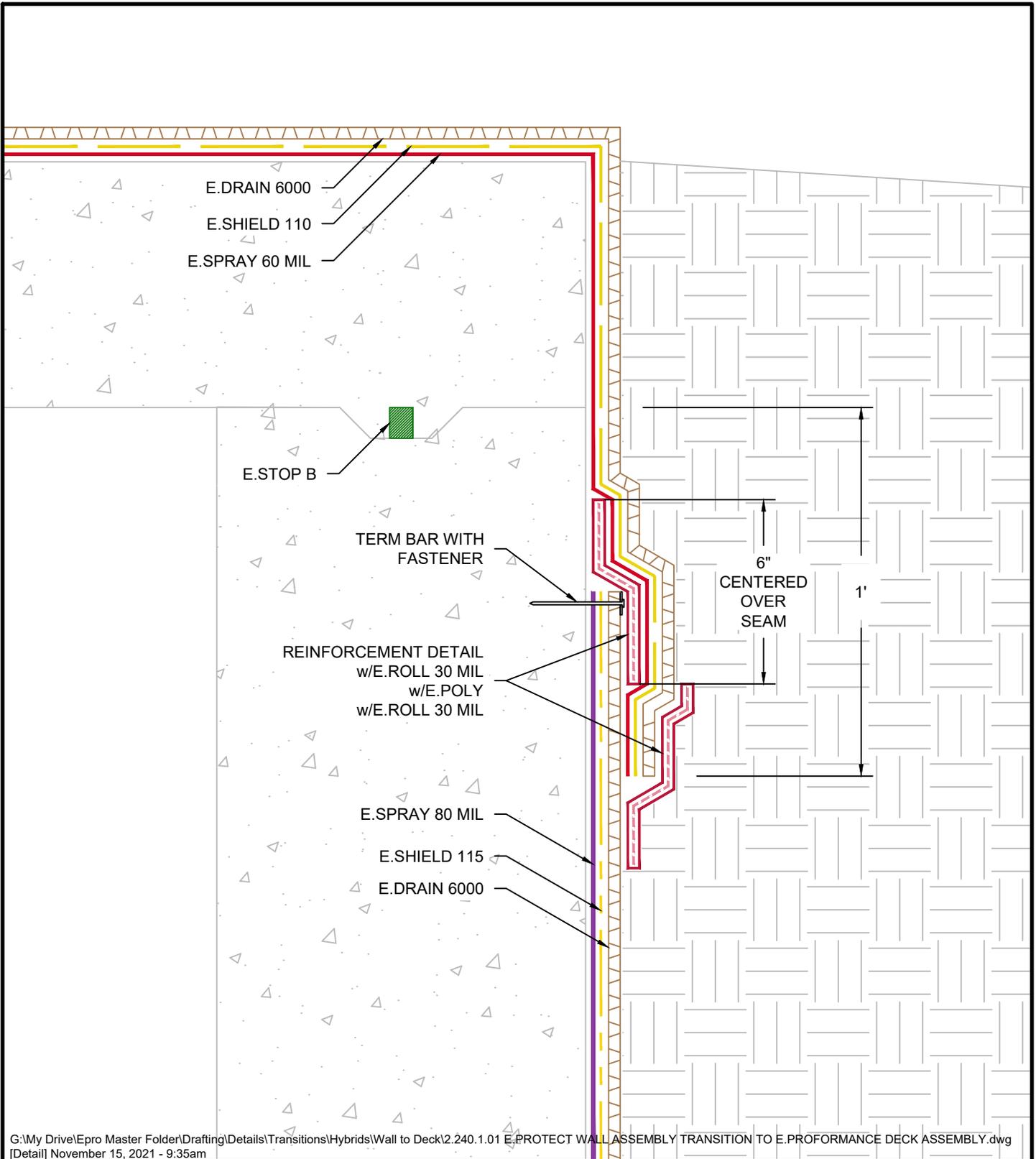
E.PROTECT WALL ASSEMBLY TRANSITION TO E.PROTECT+ DECK ASSEMBLY

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT / E.PROTECT+	2.240.1.03	
	DRAFTER	DATE	
	RJT	10/25/2021	

AS A SUPPLIER OF FINISHED PRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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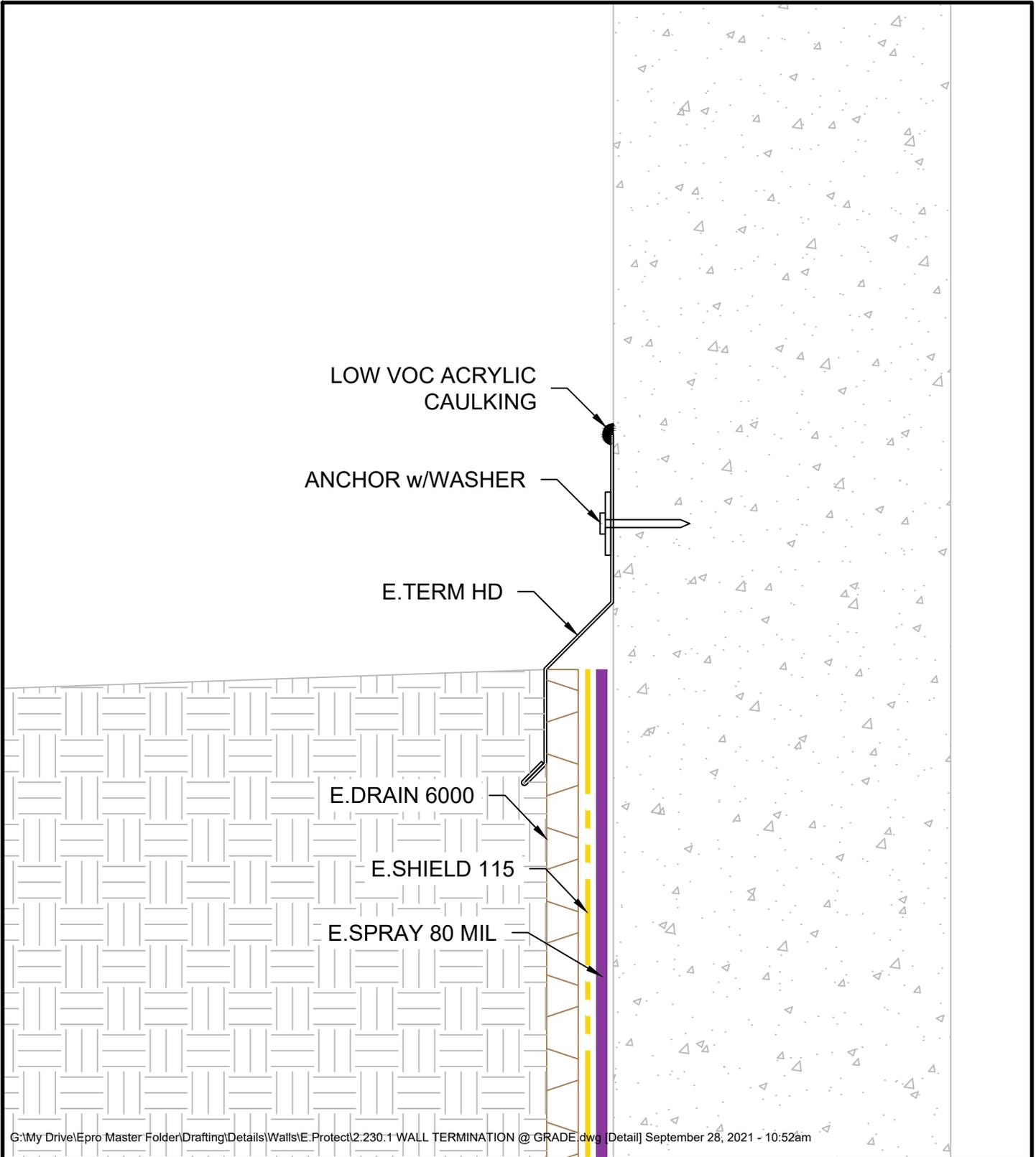
E.PROTECT WALL ASSEMBLY TRANSITION TO E.PROFORMANCE DECK ASSEMBLY

	SYSTEM NAME	DRAWING NUMBER	
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	DRAFTER	DATE	
	RJT	10/25/2021	

AS A SUPPLIER OF FINISHED PRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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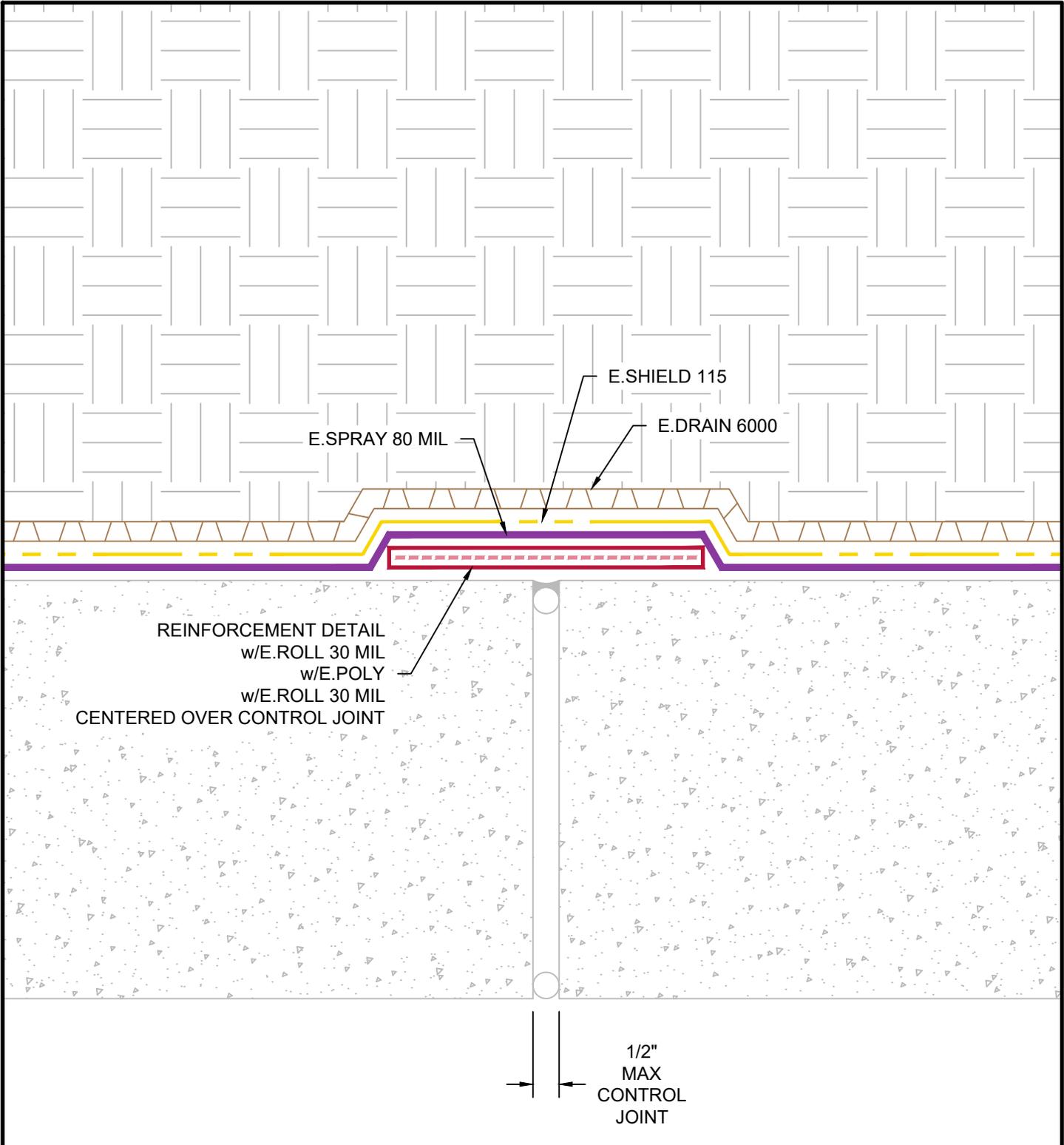
WALL TERMINATION @ GRADE

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	DRAFTER	DATE	
	RJT	09/28/2021	

AS A SUPPLIER OF FINISHED PRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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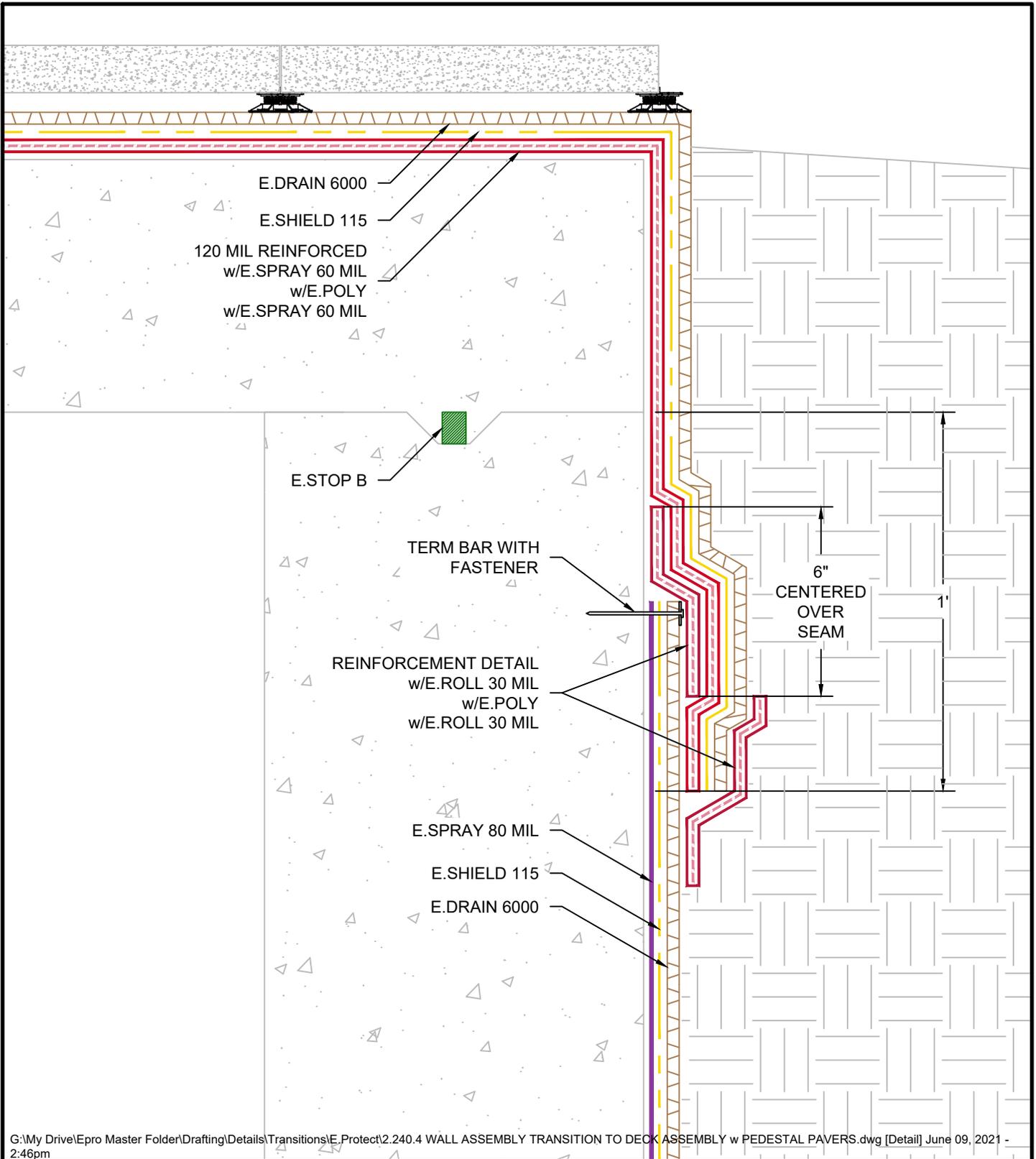
CONCRETE WALL CONTROL JOINT

	SYSTEM NAME	DRAWING NUMBER	
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	DRAFTER	DATE	
	RJT	09/22/2021	

AS A SUPPLIER OF FINISHED RPRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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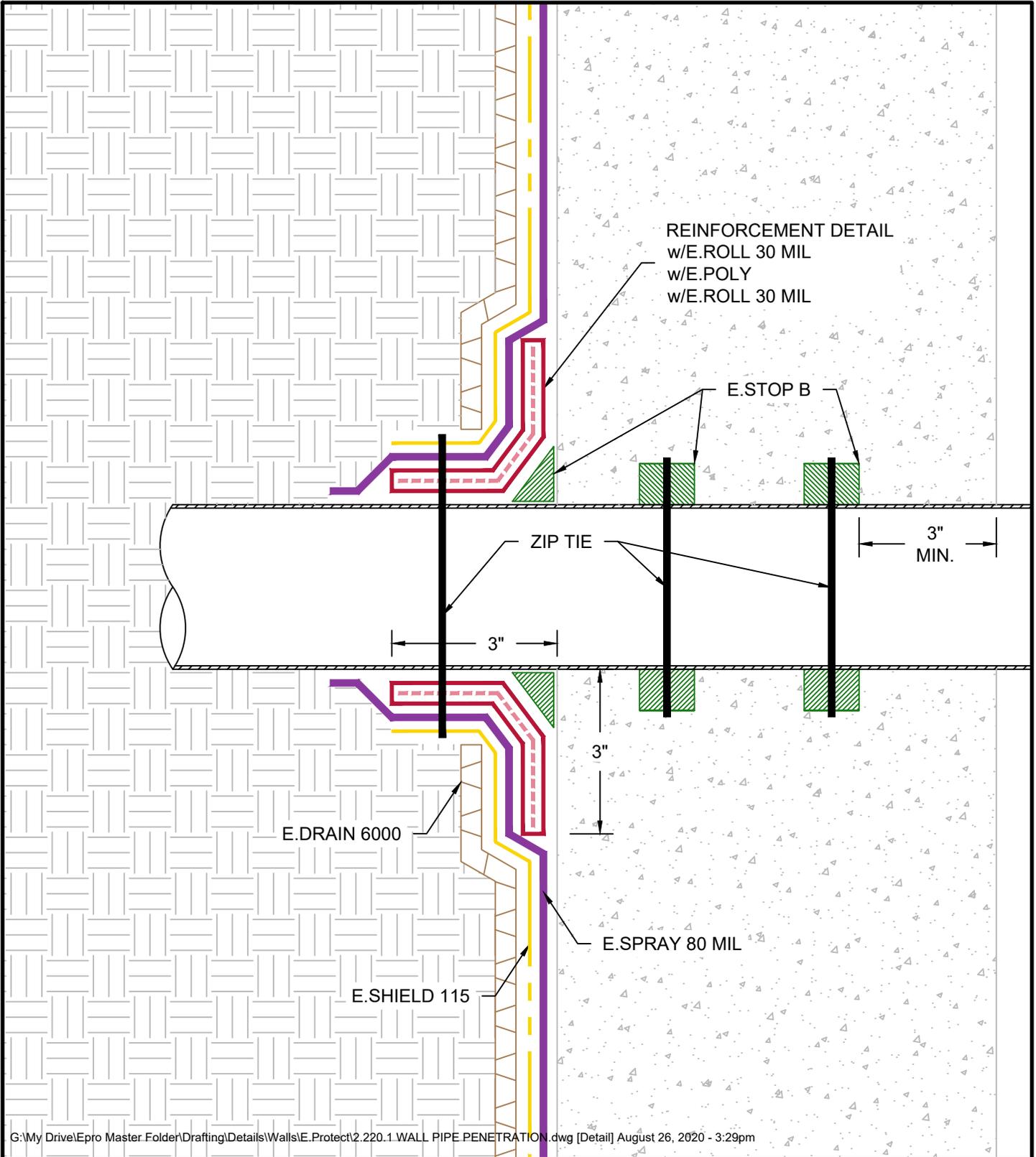
WALL ASSEMBLY TRANSITION TO DECK ASSEMBLY w/PEDESTAL PAVERS

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT	2.240.4	
	DRAFTER	DATE	
	RJT	4/07/2021	

AS A SUPPLIER OF FINISHED PRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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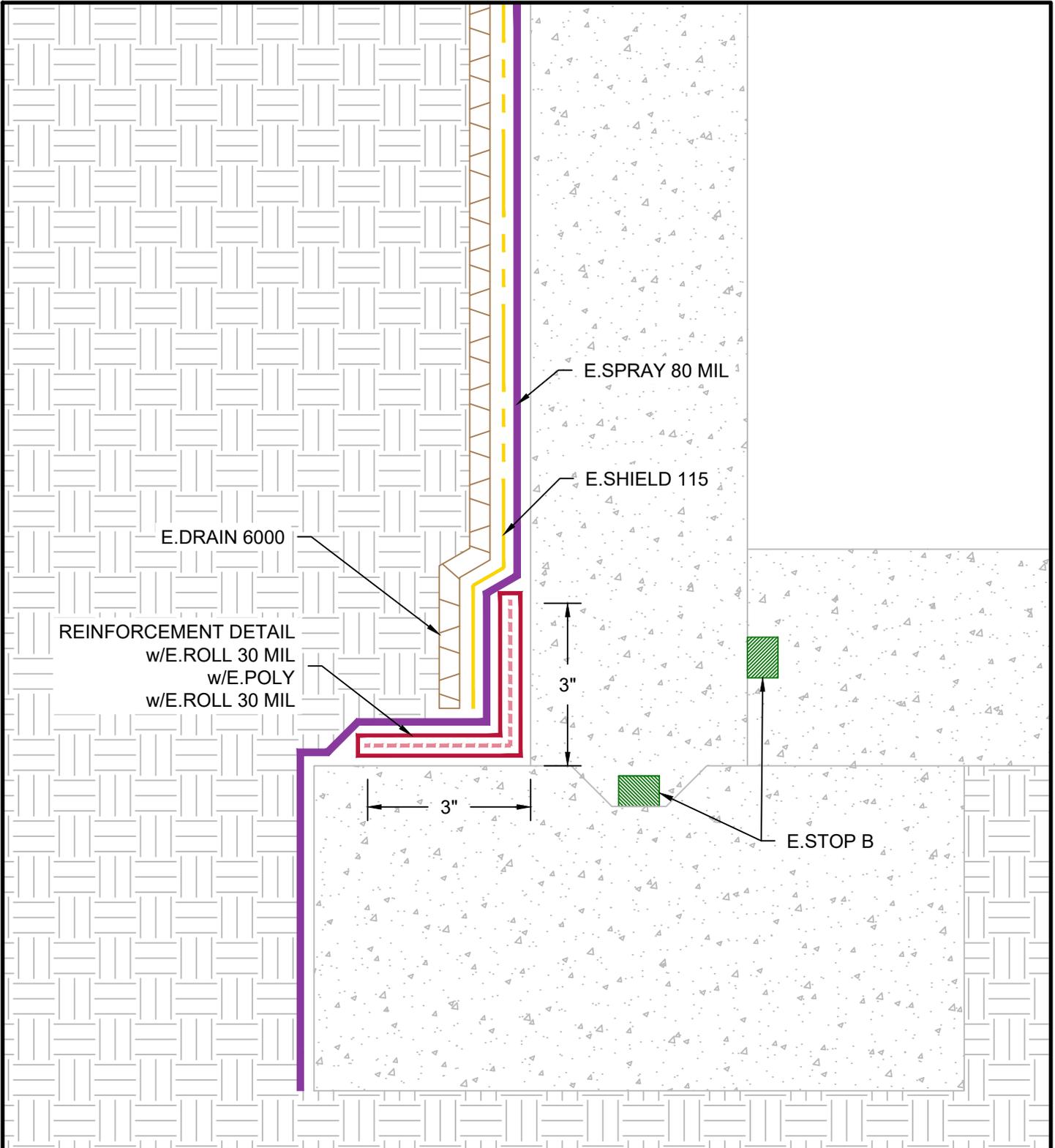
WALL PIPE PENETRATION

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT	2.220.1	
	DRAFTER	DATE	
	RJT	07/08/2020	

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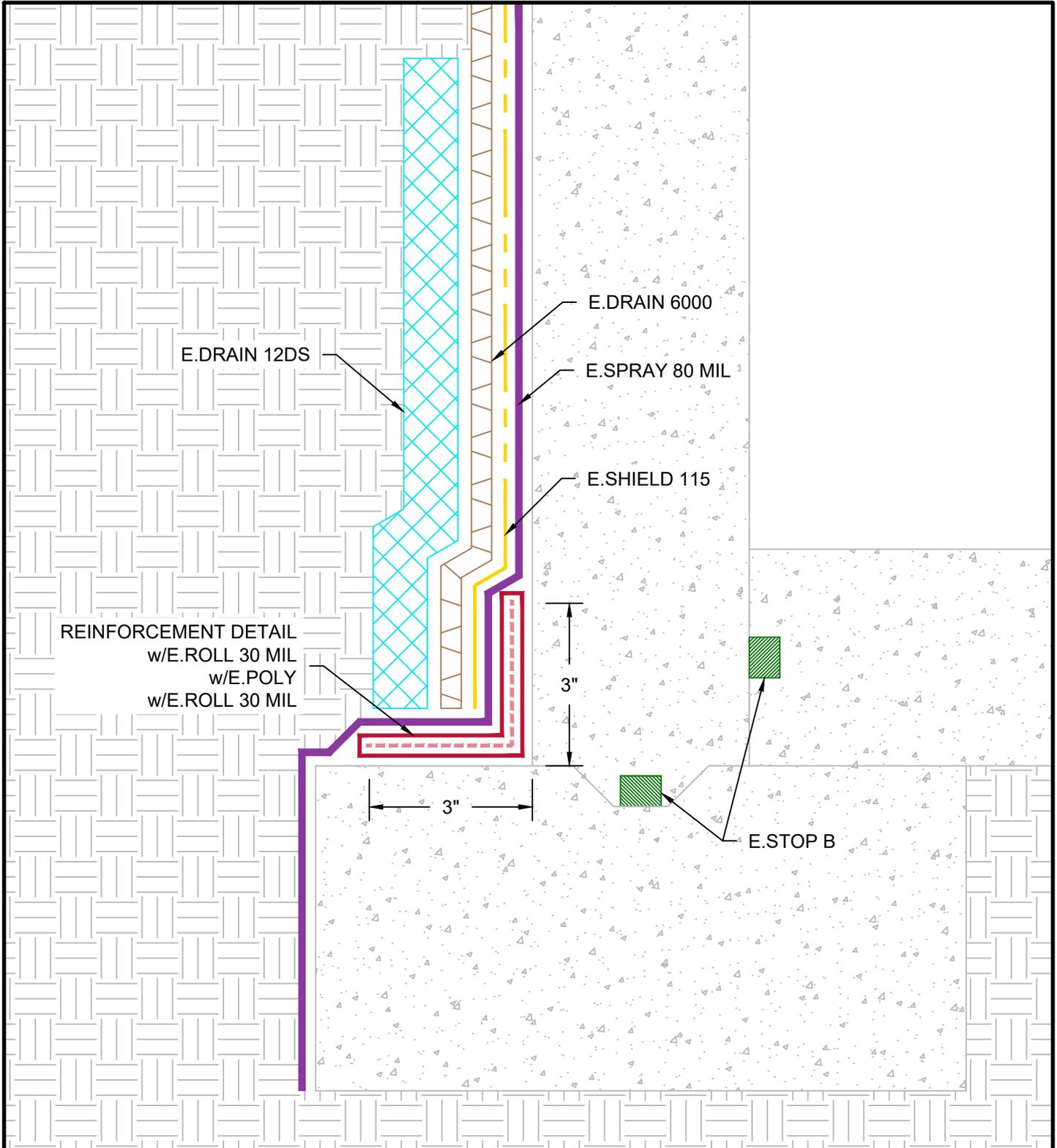
WALL BOTTOM POSITIVE SIDE

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT	2.201.1	
	DRAFTER	DATE	
	RJT	09/28/2021	

AS A SUPPLIER OF FINISHED RPRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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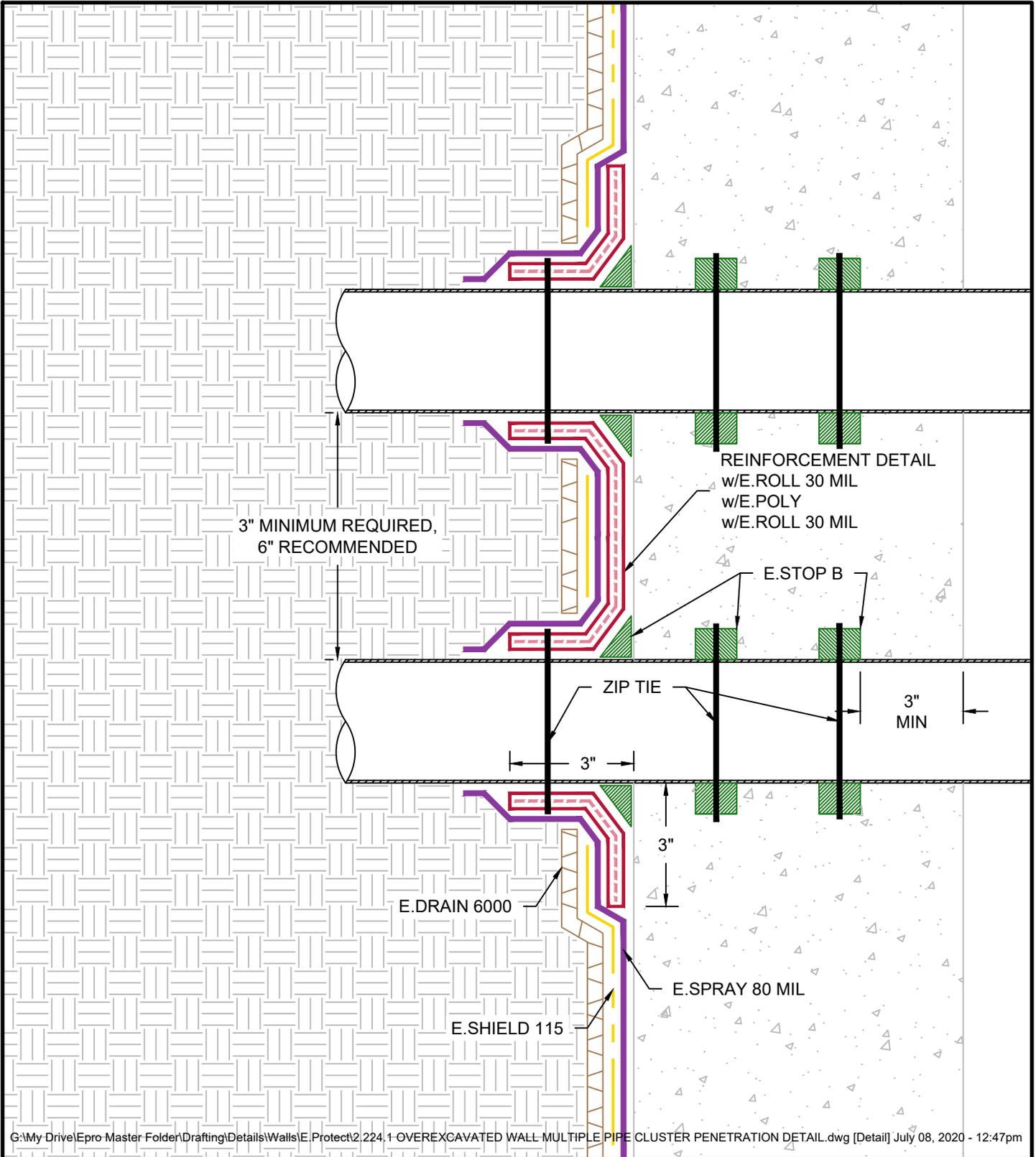
WALL BOTTOM w/SITE DRAIN POSITIVE SIDE

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT	2.201.2	
	DRAFTER	DATE	
	RJT	09/28/2021	

AS A SUPPLIER OF FINISHED PRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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G:\My Drive\Epro Master Folder\Drafting\Details\Walls\E.Protect\2.224.1 OVEREXCAVATED WALL MULTIPLE PIPE CLUSTER PENETRATION DETAIL.dwg [Detail] July 08, 2020 - 12:47pm

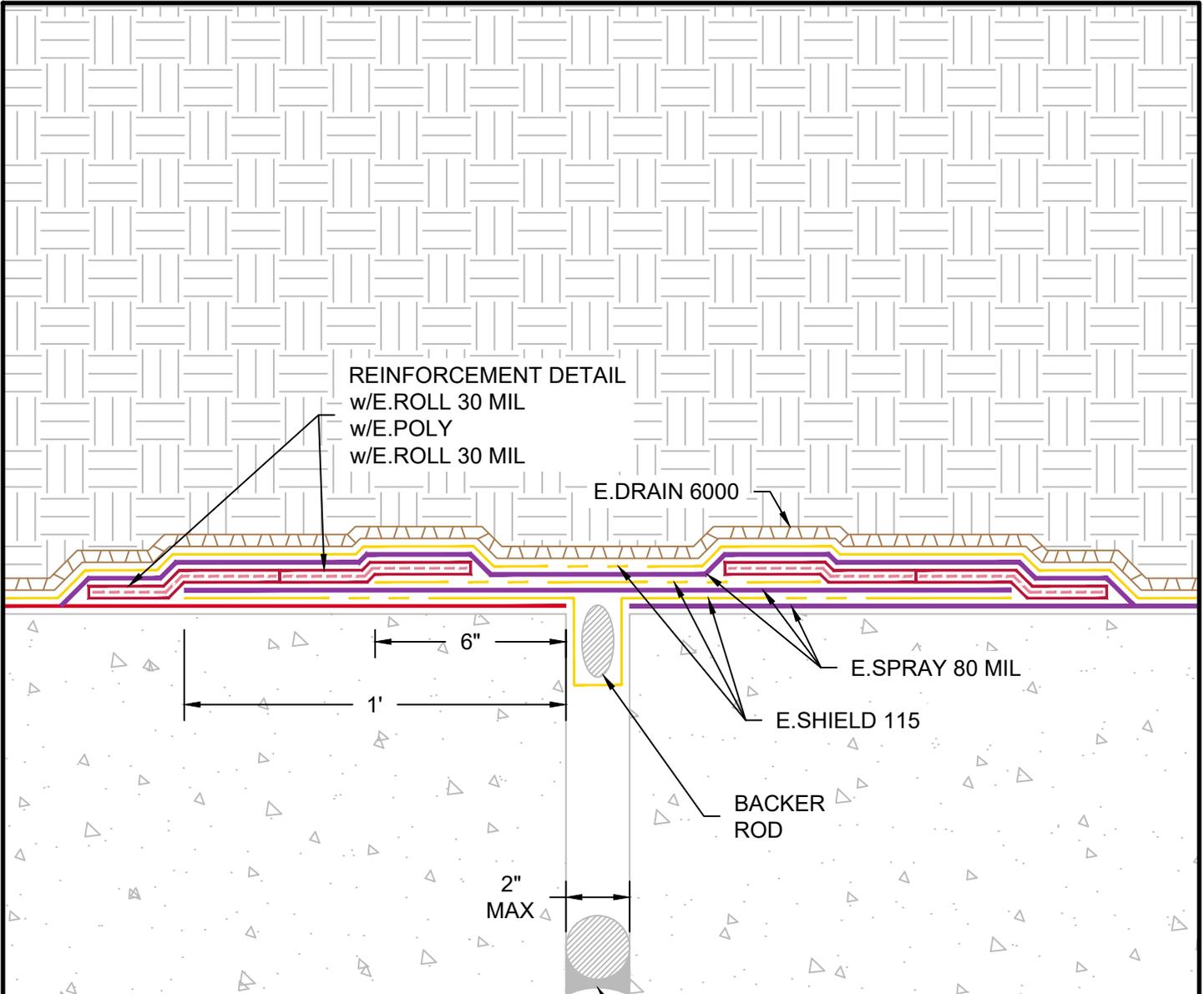
OVER EXCAVATED WALL MULTIPLE PIPE CLUSTER PENETRATION DETAIL

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT	2.224.1	
	DRAFTER	DATE	
	RJT	07/08/2020	

AS A SUPPLIER OF FINISHED RPRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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REINFORCEMENT DETAIL
w/E.ROLL 30 MIL
w/E.POLY
w/E.ROLL 30 MIL

E.DRAIN 6000

E.SPRAY 80 MIL

E.SHIELD 115

BACKER ROD

2" MAX

BACKER ROD
w/URETHANE SEALANT

G:\My Drive\Epro Master Folder\Drafting\Details\Walls\E.Protect\2.211.1 CONCRETE WALL SEISMIC EXPANSION JOINT.dwg [Detail] September 22, 2021 - 1:55pm

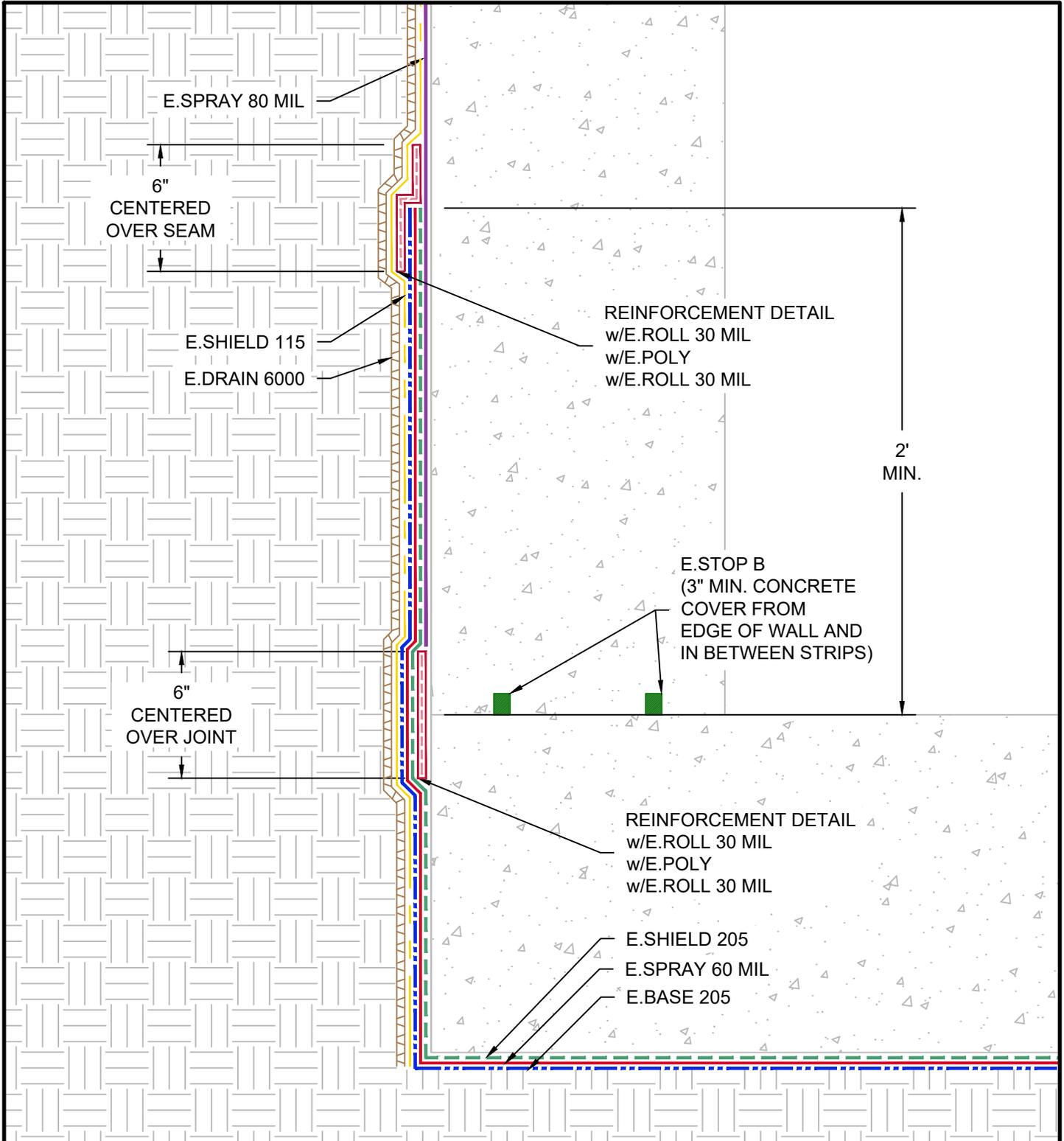
CONCRETE WALL SEISMIC EXPANSION JOINT

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT	2.211.1	
	DRAFTER	DATE	
	RJT	09/22/2021	

AS A SUPPLIER OF FINISHED PRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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G:\My Drive\Epro Master Folder\Drafting\Details\Transitions\Hybrids\Underslab to Wall\1.143.1.2 E.PROFORMANCE UNDERSLAB ASSEMBLY - VERTICAL TRANSITION - E.PROTECT POST-APPLIED SYSTEM.dwg [Detail] March 08, 2021 - 8:35am

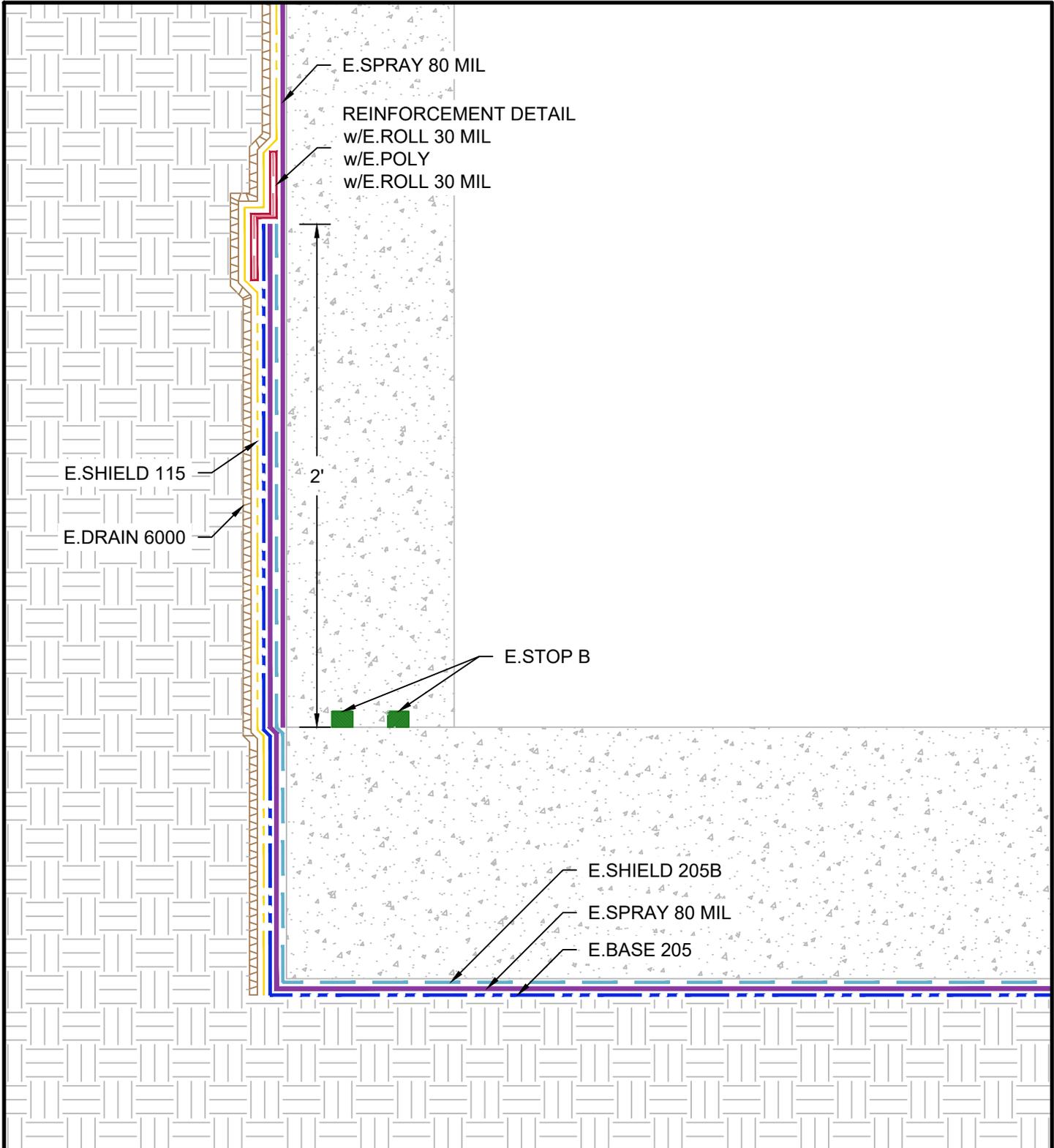
UNDERSLAB ASSEMBLY - VERTICAL TRANSITION - E.PROTECT POST-APPLIED SYSTEM

	SYSTEM NAME	DRAWING NUMBER	
	E.PROFORMANCE TO E.PROTECT	1.143.1.2	
	DRAFTER	DATE	
	RJT	3/05/2021	

AS A SUPPLIER OF FINISHED PRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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G:\My Drive\Epro Master Folder\Drafting\Details\Transitions\E.Protect\2.143.1-UNDERSLAB ASSEMBLY TRANSITION TO OVEREXCAVATED WALL.dwg [Detail] July 07, 2020 - 12:26pm

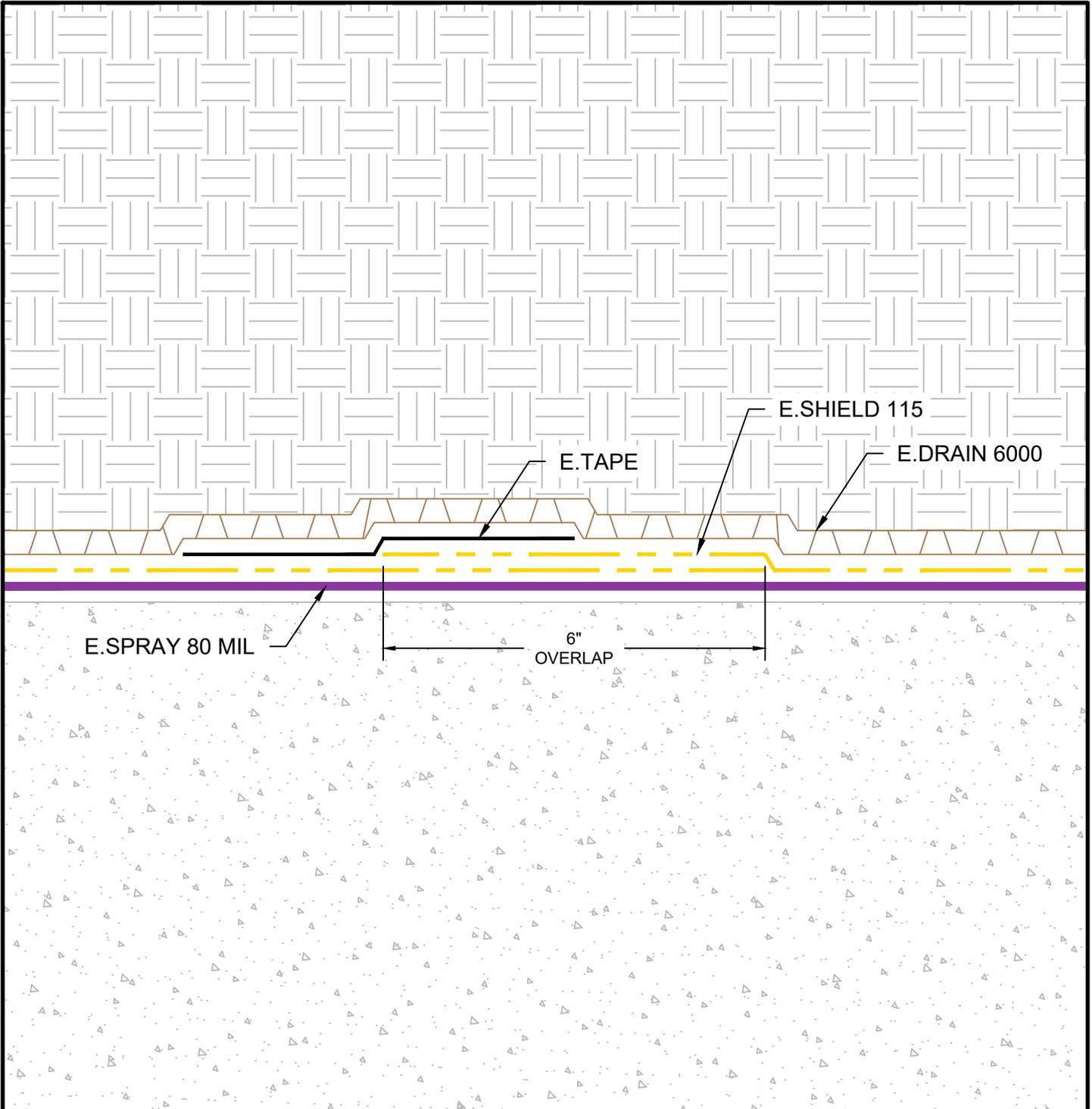
UNDERSLAB ASSEMBLY TRANSITION TO OVEREXCAVATED WALL

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT	2.143.1	
	DRAFTER	DATE	
	RJT	07/07/2020	

AS A SUPPLIER OF FINISHED PRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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G:\My Drive\Epro Master Folder\Drafting\Details\Walls\E.Protect\2.210.3 WALL E.SHIELD 115 OVERLAP.dwg [Detail] September 22, 2021 - 1:58pm

WALL E.SHIELD 115 OVERLAP

	SYSTEM NAME	DRAWING NUMBER	
	E.PROTECT	2.210.3	
	DRAFTER	DATE	
	RJT	09/22/2021	

AS A SUPPLIER OF FINISHED RPRODUCTS ONLY, EPRO SERVICES, INC. DOES NOT ASSUME RESPONSIBILITY FOR ERRORS IN DESIGN, ENGINEERING OR DIMENSIONS. THE PROJECT TEAM MUST VERIFY ALL DIMENSIONS AND SUITABILITY OF DETAILS. THE PRODUCTS LISTED ARE TRADEMARKS OF EPRO SERVICES, INC.

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