

VOLCLAY®
ENVIROSHEET™

**SHEET MEMBRANE
WATERPROOFING SYSTEM**

PRODUCT MANUAL

CONTENTS

| | |
|-------------|------------------------------------|
| SECTION 1: | PRODUCT DESCRIPTIONS |
| SECTION 2: | APPLICATIONS |
| SECTION 3: | INSTALLATION GUIDELINES |
| | 3.1 Substrate Preparation |
| | 3.2 Substrate Priming |
| | 3.3 Detail Work |
| SECTION 4: | FOUNDATION WALLS |
| | 4.1 Membrane Installation |
| | 4.2 Penetrations |
| | 4.3 Termination At Grade |
| | 4.4 Under Slab Waterproofing |
| SECTION 5: | HORIZONTAL APPLICATIONS |
| | 5.1 Membrane Installation |
| | 5.2 Deck-to-Wall Corner Transition |
| | 5.3 Penetrations |
| | 5.4 Drains |
| SECTION 6: | INSPECTION AND REPAIR |
| SECTION 7: | FLOOD TESTING |
| SECTION 8: | PROTECTION COURSE |
| SECTION 9: | DRAINAGE COMPOSITE |
| SECTION 10: | BACKFILL |

SECTION 1 PRODUCT DESCRIPTIONS

Envirosheet is a self adhering sheet membrane system used for waterproofing concrete, masonry and wood. It is ideal for waterproofing foundation walls, tunnels, and split-slab construction such as plazas and parking decks either above or below grade. Envirosheet can be used on either interior or exterior subsurface applications.

The Envirosheet system is a complete waterproofing system comprised of a durable sheet membrane and associated accessory products.

• ENVIROSHEET MEMBRANE

Envirosheet is a 60-mil thick sheet waterproofing membrane comprised of a 4-mil cross laminated polyethylene sheet laminated to a thick layer of rubberized asphalt compound. The sheet is 36" (914mm) wide by 66.7 feet (20.3 m) long. Envirosheet is formulated for temperature applications down to 50°F (10°C). The product is wound into rolls with a disposable silicone coated release paper backing. The edge of the sheets have a quick strip removal tape that allows excellent seam sealing ability. Envirosheet is packaged in 200 square foot (18.5 sq m) rolls. Rolls are individually packaged in corrugated cartons and shrink-wrapped 25 rolls per pallet.

• ENVIROSHEET LT MEMBRANE

Envirosheet is also manufactured in a low temperature grade - Envirosheet LT - for application temperatures 25°F (-4°F) to 60°F (16°C). Envirosheet LT membrane is 60-mils thick by 36" wide by 66.7' long; 200 sq ft per roll.

• ENVIROPRIMER WB

Enviroprimer WB is a water-based polymer emulsion primer designed to provide excellent adhesion of Envirosheet waterproofing membrane to structural substrates. Apply in dry weather above 40°F (4°C) at a rate of 400-600 sq ft per gallon (37-55 sq m per 3.78liters).

• ENVIROPRIMER SB

Enviroprimer SB is a solvent-based primer designed to provide excellent adhesion of Envirosheet waterproofing membrane to structural substrates. Apply in dry weather above 25°F (-4°C) at a rate of 300-350 sq ft per gallon (27-32 sq m per 3.78liters).

• ENVIROMASTIC

Enviromastic is a trowel-grade waterproofing mastic designed for a variety of detailing uses including, fillet material at inside corners; flashing material around drains, protrusions, and penetrations; sealing material at grade terminations and membrane overlap seams; and repair material for small concrete surface defects.

• AQUADRAIN

Subsurface drainage composite consisting of dimpled, high-impact polystyrene core and filter fabric. Designed to promote positive drainage and membrane protection.

• PROTECTION MAT 10V

Protection Mat 10V is a tough non-woven geotextile used to protect the membrane from damage.

MATERIAL STORAGE

Protect all materials from precipitation and physical damage. All materials should be stored above 50°F (10°C). Do not store at temperatures above 90°F (32°C) for extended periods. Store all products in a dry area away from flames, sparks, high heat, and prolonged exposure to direct sunlight. During outside storage at jobsite, provide tarpaulin cover on top and all sides, allowing for adequate ventilation. Do not double stack pallets.

PRECAUTIONS

Avoid inhalation of vapor or spray mist from primers or mastic. Ensure adequate ventilation. Avoid contact of primers and mastic with skin. Protective clothing is recommended. Contact areas should be thoroughly washed with water. Avoid ingestion of material. If ingestion occurs, contact a physician immediately. Additional safety information is contained in the MSDS Sheet.

**SECTION 2
APPLICATIONS**

Envirosheet is ideal for waterproofing structural concrete, masonry, and wood surfaces where the in-service temperature will not exceed 130°F (54°C). Envirosheet can be applied to foundation walls, tunnels, and earth sheltered structures. It can also be used in split-slab construction, both above and below grade, such as plaza decks, balconies, planters, and parking decks. Interior uses include mechanical rooms, kitchens, bathrooms, and laboratories.

LIMITATIONS

Envirosheet should not be applied to areas that will be permanently exposed to direct sunlight. Do not use Envirosheet membrane as a wearing surface. Do not use Envirosheet as a pond or tank liner unless fully protected by a concrete slab. Do not apply Envirosheet membrane or accessory products to frozen, frosted or wet surfaces. Do not apply Envirosheet membranes over substrates containing petroleum solvents, fuels or oils.

Envirosheet membranes are compatible with aged asphalt and coal tar products. They are incompatible with creosote, pentachlorophenol, and joint sealants containing polysulfide polymer.

Tile set in thin-set mortar is not recommended over Envirosheet membranes. Use a cement-based mortar setting bed with a minimum thickness of 1-1/4" (30mm) as recommended by the Ceramic Tile Institute.

Envirosheet membrane is not intended to provide the primary waterproofing for expansion joints. Laboratory testing has shown that Envirosheet membrane is capable of bridging cracks in concrete up to 1/16" (1.5mm).

APPLICABLE STANDARDS

Envirosheet waterproofing meets the requirements of the following specifications:

- AIA MASTERSPEC® Section 07100
- CSI SPECTEXT® Section 07110
- Corps of Engineers CEGS-07111
- Department of the Navy NFGS-07111
- Federal Construction Guide Specification 07111
- American Railway Engineering Association 29-2-4

**SECTION 3
INSTALLATION GUIDELINES**

Before installing Envirosheet™ read this installation manual to gain familiarity with specific procedures and applications. Apply Envirosheet when temperature is 50°F (10°C) and above. Apply Envirosheet LT when temperature is 25°F (-4°C) to 60°F (16°C). For applications not covered in this manual, contact CETCO for specific installation guidelines.

3.1 SUBSTRATE PREPARATION

Prior to installing Envirosheet, the substrate must be properly prepared. Substrate may be concrete, steel, wood or masonry block. Substrate should be clean, smooth, monolithic and free of voids and sharp protrusions. Apply Envirosheet only to a properly prepared substrate.

CONCRETE SURFACE PREPARATION

Concrete should be dry and have a minimum 7 days curing time (14 days for lightweight structural concrete). If concrete is placed over a non-vented metal pan deck, double the drying time. Use form release agents which will not transfer to the concrete. Remove forms as soon as possible from below horizontal deck slabs to prevent entrapment of excessive moisture. Cure concrete with clear, resin-based curing compounds containing no oil, wax, or pigment. Allow concrete to thoroughly dry after rain.

Repair all concrete surface defects such as spalls or poorly consolidated areas with cement based patching material. Remove sharp protrusions and form match lines.

MASONRY WALL SURFACE PREPARATION

Strike all mortar joints flush to the face of smooth masonry block or apply a parget coat to entire surface of rough masonry block with cement based material. Remove any mortar clumps attached to the face of the masonry.

CONSTRUCTION JOINTS

Volclay Waterstop-RX® should be installed in all applicable concrete construction joints. Waterstop-RX is a flexible, expanding strip waterstop designed for non-moving concrete construction joints. Expansion joints should be sealed with appropriate joint filler and sealant. Envirosheet is not a substitute for proper joint sealing design. Prestrip all cracks and construction joints over 1/16" (2mm) wide with a 9" (225mm) wide membrane strip.

3.2 SUBSTRATE PRIMING

Apply properly stirred Enviroprimer over the entire surface with a chemical resistant roller or brush. Allow primer to dry until it does not release when touched. If dusty conditions exist on the jobsite, apply membrane as soon as primer has dried. Reprime all areas contaminated with dust or dirt prior to membrane installation. Reprime all surfaces where membrane is not applied within 24 hours.

Drying time for primer may be longer at cold temperatures. Most metal surfaces do not require priming but must be clean, dry and free of paint, rust or other contaminant.

3.3 DETAIL WORK

WALL-TO-FOOTING JOINTS

Option 1 (Detail 1): Detail wall-to-footing joint with a 3/4" (18mm), 45° angle fillet of Enviromastic. Center a 12" (300mm) strip of Envirosheet over the joint. Place wall membrane and continue it down the wall and onto the footing a minimum of 6" (150mm). Terminate with Enviromastic. Seal all membrane overlaps within 12" (300mm) of the wall/ footing joint, substrate transitions, and T-Joints with Enviromastic.

Option 2 (Detail 2): Apply membrane to within 1" (25mm) of base of wall. Install a 3/4" (18mm) fillet of Enviromastic and extend mastic onto membrane and footing a minimum of 2-1/2" (65mm), 90-mils thick.

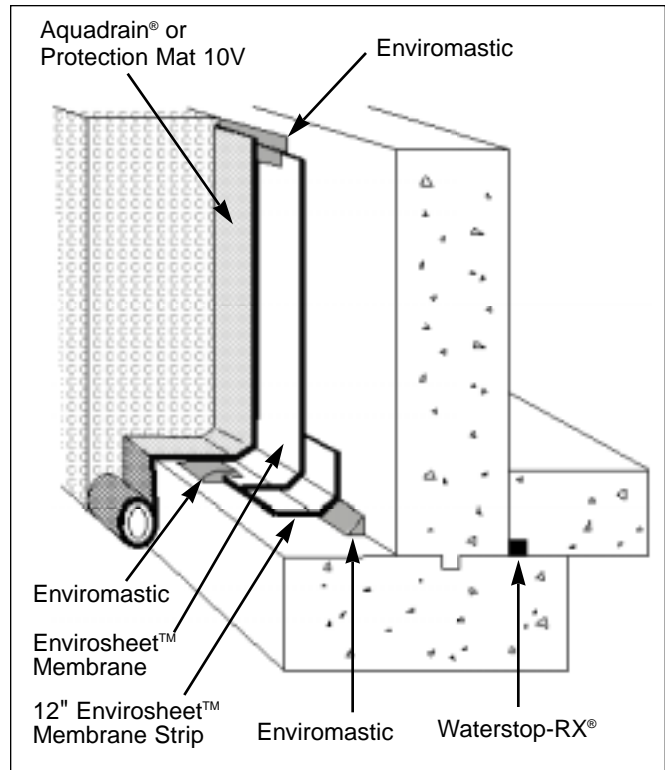
Option 3 (Detail 3): If the bottom of the interior floor slab is a minimum of 6" (150mm) above the top of the footing, the membrane may be terminated at the base of the wall. Form a 3/4" (18mm) fillet of Enviromastic in corner and extend mastic 90-mils (2.3mm) thick up the wall and onto the membrane 2-1/2" (65mm).

INSIDE AND OUTSIDE CORNER TRANSITIONS

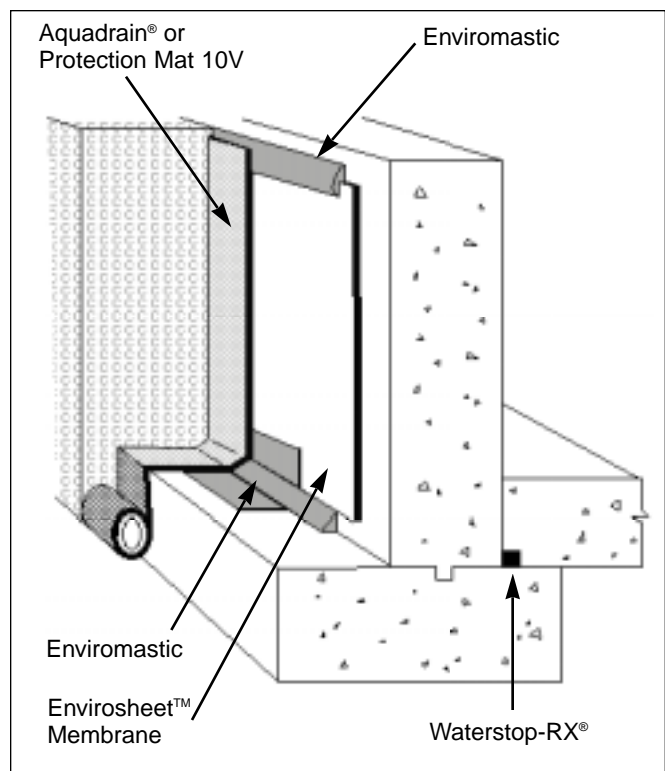
Prestrip all wall-to-wall inside and outside corners (vertical) with a 12" (300mm) wide piece of Envirosheet centered over the corner. Press tightly to assure full contact to primer. Cover with full sheet of membrane to ensure 2-ply coverage (**Detail 4**).

PENETRATIONS

Apply Envirosheet membrane to within 1" (25mm) of any penetration. Then apply a 3/4" (18mm) fillet of Enviromastic around the base of the penetration. Extend mastic onto both the penetration and the membrane a minimum 2-1/2" (65mm) at a thickness of 90-mils (2.3mm) (**Detail 5**).

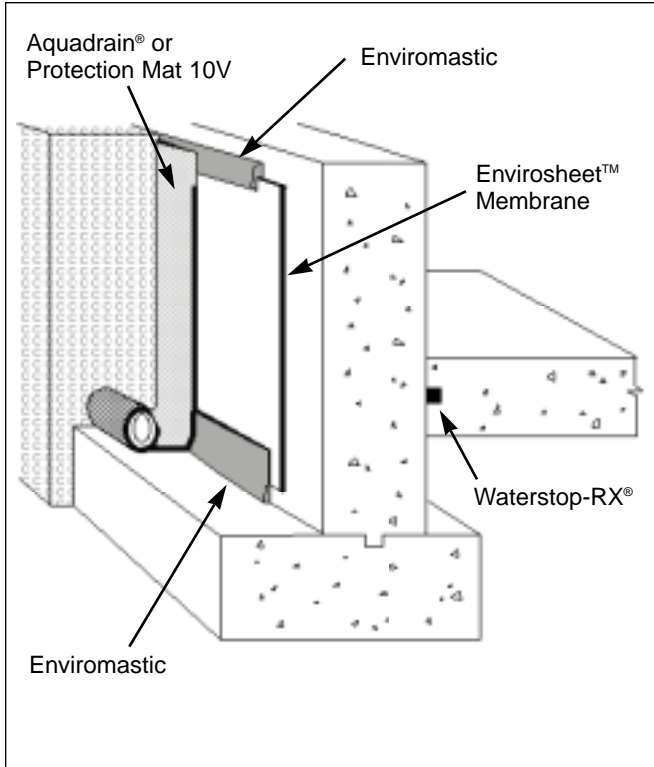


Detail 1 - Foundation Wall (Slab On Footing) Option 1

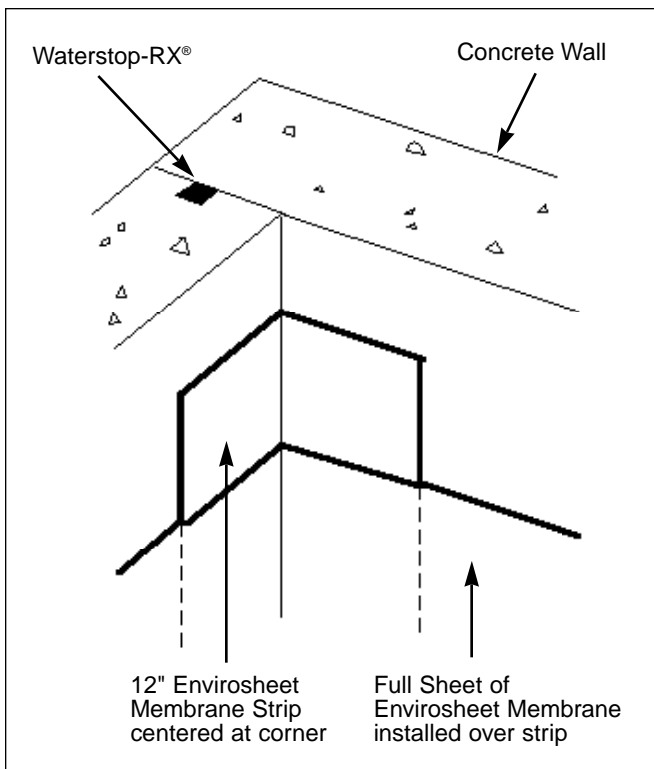


Detail 2 - Foundation Wall (Slab On Footing) Option 2

SECTION 4 FOUNDATION WALLS



Detail 3 - Foundation Wall (Elevated Floor Slab)
Option 3



Detail 4 - Wall-To-Wall Inside Corner Detail.

Properly prepare substrate, complete all detail work and prime prior to installing membrane.

4.1 MEMBRANE INSTALLATION

For ease of installation, apply Envirosheet in lengths no greater than 8-feet (2.4 meters). Remove release paper to apply membrane sheet adhesive side down. Remove clear plastic quick strip along membrane edge to expose rubberized asphalt compound. Overlap all seams and endlaps a minimum of 2-1/2" (65mm). Firmly press membrane into place and roll all seams to insure full adhesion. Apply a bead of Enviromastic at all membrane terminations at the end of each days work.

4.2 PENETRATIONS

Apply Envirosheet membrane to within 1" (25mm) of any penetration. Then apply a 3/4" (18mm) fillet of Enviromastic around the base of the penetration. Extend mastic onto both the penetration and the membrane a minimum 2-1/2" (65mm) at a thickness of 90-mils (2.3mm) (**Detail 5**).

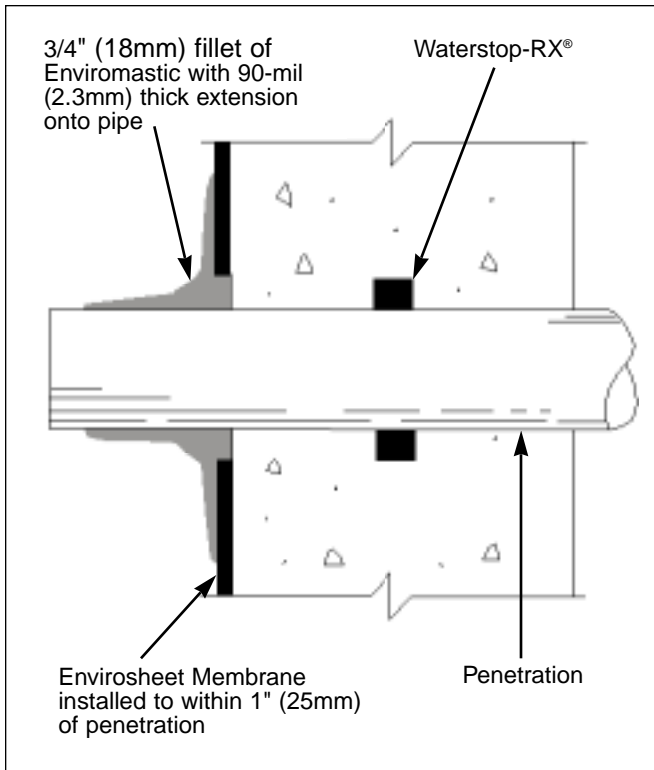
In areas where multiple penetrations are close together, it may be impractical to cut the membrane to fit between the penetrations. Apply Enviromastic 3/4" (18mm) thick around the penetrations and flash 90-mils thick covering the area between the penetrations. Extend the mastic 90-mils thick onto the penetrations a minimum 2-1/2" (65mm).

4.3 TERMINATION AT GRADE

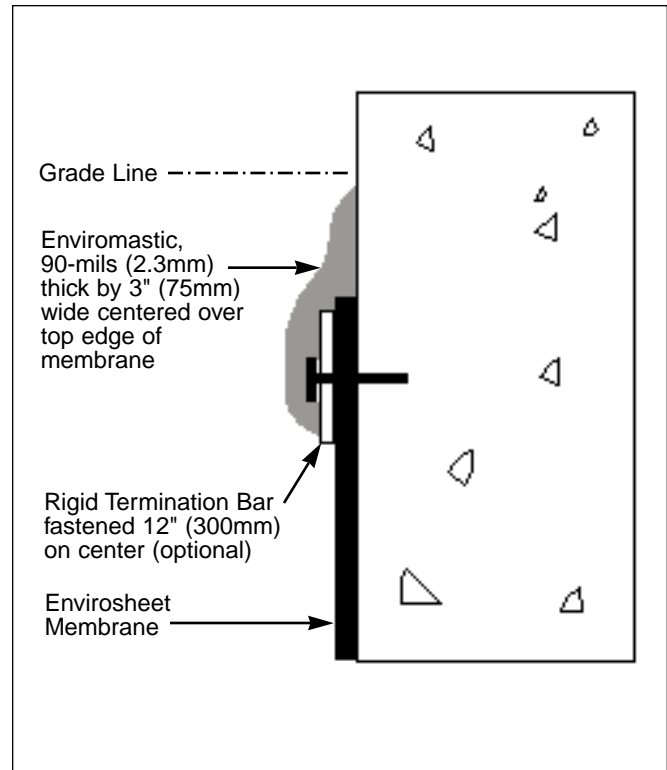
Terminate the membrane at grade level. Press membrane edge firmly against the wall using a hand roller or similar device. Membrane edge may be secured with a fastened termination bar or reglet (**Detail 6**). Apply 90-mil (2.3mm) thick, 3" (75mm) wide flashing of Enviromastic centered on top edge of membrane.

4.4 UNDER SLAB WATERPROOFING

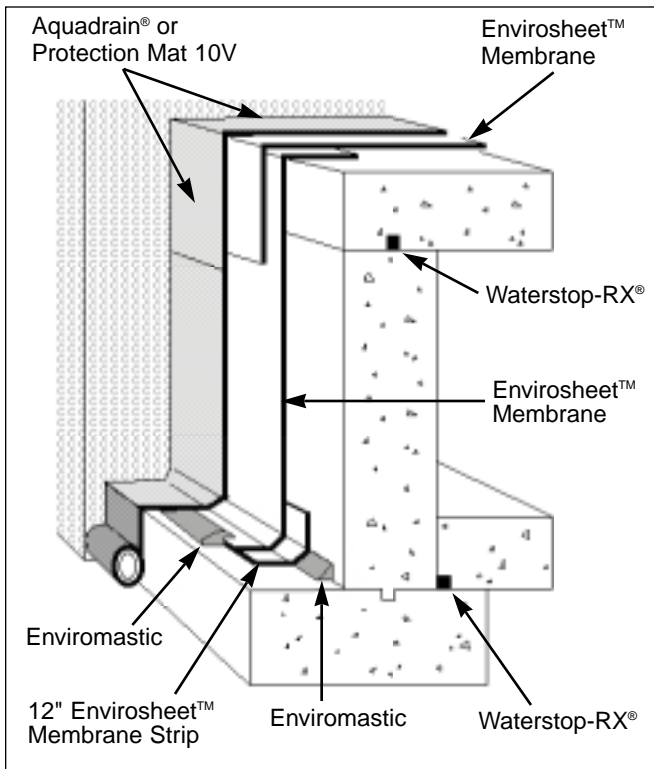
If waterproofing under the structural floor slab is required, CETCO recommends the use of Voltex® Geotextile Bentonite Waterproofing. For non-hydrostatic conditions, terminate Voltex® with Bentoseal® at the footing/slab junction (**Detail 8**). For hydrostatic conditions, continue Voltex under the footing and overlap Envirosheet membrane from the foundation wall a minimum 6" (150mm). Mechanically fasten Voltex termination edge 12" (300mm) on center (fastener will pass through Envirosheet) and apply Bentoseal. Then apply 12" (300mm) strip of Envirosheet membrane centered over Voltex termination. Refer to Voltex Product Manual for Voltex installation guidelines.



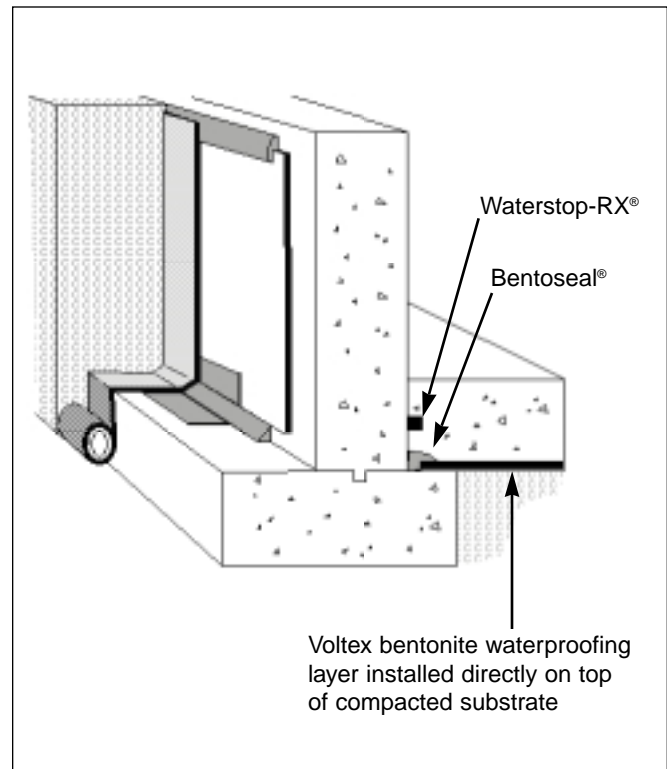
Detail 5 - Single poured-in-place penetration detail.



Detail 6 - Grade termination with rigid termination bar. Roll terminating membrane edge firmly.



Detail 7 - Earth-Covered Roofs and Tunnels require a double membrane layer at the transition corner.



Detail 8 - Volclay Voltex® waterproofing system under the floor slab with Envirosheet membrane on the foundation wall.

SECTION 5 HORIZONTAL APPLICATIONS

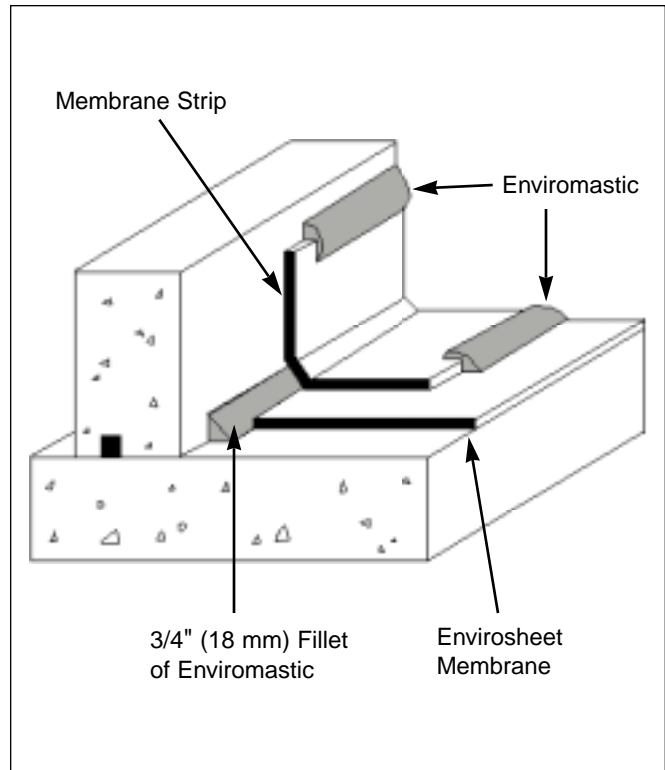
Properly prepare substrate, complete all detail work and prime prior to installing membrane.

5.1 MEMBRANE INSTALLATION

Apply Envirosheet from low to high point to allow a shingle effect for water drainage. Remove release paper to apply membrane sheet adhesive side down. Remove clear plastic quick strip along membrane edge to expose rubberized asphalt compound. Overlap all membrane seams a minimum of 2-1/2" (65mm). Stagger all end laps. Firmly press membrane into place and roll with a minimum 75-lb. (34 Kg) padded roller. Apply a bead of Enviromastic at all membrane terminations at the end of each days work.

5.2 DECK-TO-WALL CORNER TRANSITION

Apply membrane to within 1" (25mm) of wall. Apply 3/4" (18mm), 45° angle fillet of Enviromastic in corner. Apply membrane strip on wall to just under the height of the wear surface and extending onto previously installed deck membrane. Seal both edges of membrane strip with 90-mil thick flashing of Enviromastic (**Detail 9**).



Detail 9 - Deck-to-Wall Inside Corner Detail.

5.3 PENETRATIONS

Apply membrane to within 1" (25mm) of the penetration. Then apply a 90-mil thick layer of Enviromastic extending a minimum of 2-1/2" (65mm) onto the membrane and up the penetration to just below the top elevation of the wearing course.

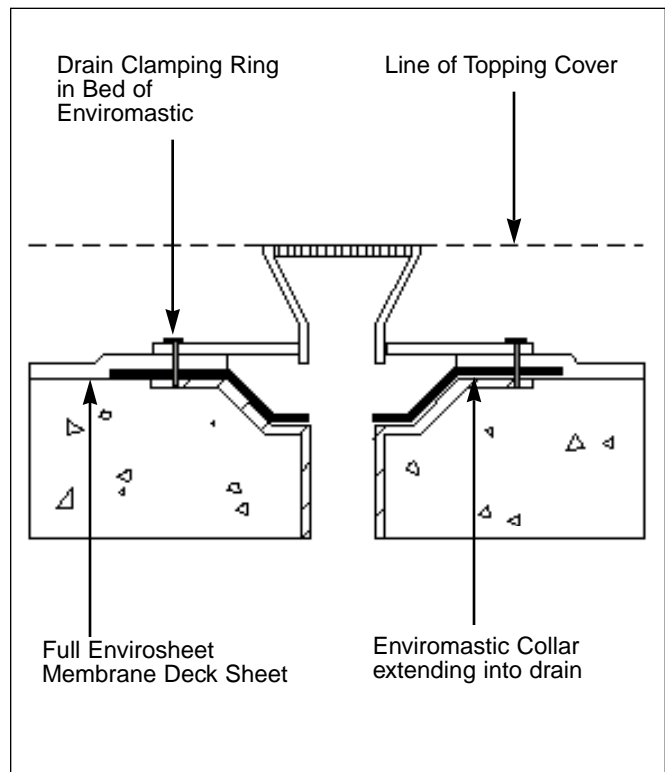
5.4 DRAINS

Apply 90-mil (2.3mm) thick layer of Enviromastic extending from drain throat to a 6" (150mm) radius around drain collar on the deck. Apply full sheet of membrane over drain and cut out membrane flush with inside wall of drain. After Enviromastic has cured, install drain clamping ring in 90-mil (2.3mm) bed of Enviromastic so that it extends under the clamping ring (**Detail 10**).

Seal all laps within 12" (300mm) of all corners and seal all T-Joints with Enviromastic. Apply a bead of Enviromastic at all membrane terminations at the end of each days work.

6.0 INSPECTION AND REPAIR

Inspect Envirosheet for tears, punctures, air blisters and unsealed seams prior to installing protection course. Remove all membrane that is not fully adhered and repair with a membrane patch extending 6" (150mm) onto existing, fully adhered membrane.



Detail 10 - Deck Drain Detail. CETCO recommends using a double stage drain for all deck drains.

Repair any damaged areas or inadequately lapped membrane seams with a membrane patch extending 6" (150 mm) onto existing, fully adhered membrane. Seal edges with Enviromastic.

7.0 FLOOD TESTING (If Required)

Before flood testing ensure deck can withstand the dead load. Allow 24 hour cure time for Envirosheet installation prior to flood test. Flood with a minimum of 2" (50 mm) of water. Repair any leaks prior to installing slab or wearing surface.

8.0 PROTECTION COURSE

Envirosheet membrane requires a protection course to avoid damage from other trades, construction materials and backfill. Ensure that the membrane surface is clean and free of stones or other debris prior to the installation of protection course. Do not leave membrane exposed to direct sunlight for any extended period of time.

Protect vertical applications the same day the membrane is applied. Use applicable Aquadrain prefabricated drainage composite or Protection Mat 10V. Adhere as necessary to membrane with Enviroprimer SB or general construction adhesive. Do not puncture membrane with attachment devices. Protect exposed membrane at the top of the wall with weather-resistant flashing material such as aluminum, copper, or neoprene.

Protect horizontal applications the same day the membrane is applied or immediately after a successful flood test. Use applicable Aquadrain prefabricated drainage composite or Protection Mat 10V. Adhere as necessary to membrane with Enviroprimer SB or general construction adhesive. Alternate protection materials include 1/8" (3 mm) and 1/4" (6 mm) asphaltic hardboard. Apply asphaltic hard-board according to manufacturer's recommendations. Do not puncture membrane with attachment devices. Use concrete bricks or plastic bar chairs when placing reinforcing steel on protection course over membrane.

9.0 DRAINAGE COMPOSITE

Good draining backfill should be used in conjunction with a foundation drain system to prevent hydrostatic conditions against the foundation. Aquadrain® subsurface drainage composite is recommended to provide a consistent, high capacity flow path for water to the drain discharge pipe at the base of the wall.

10.0 BACKFILL

Carefully place compactible well draining soil. Follow generally accepted practices for placing and compacting backfill. Backfill should be added in 6" (150 mm) to 12" (300 mm) lifts. Backfill material should be free of large rocks and other debris. Avoid damaging the waterproofing system with compaction equipment and backfill.



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LIMITED WARRANTY

The information and data contained herein are believed to be accurate and reliable. Specifications and other information contained herein supersede all previously printed material and are subject to change without notice.

Manufacturers warranty of installed system is available. Contact seller for terms and sample document including all limitations.

All goods sold by seller are warranted to be free from defects in material and workmanship.

The foregoing warranty is in lieu of and excludes all other warranties not expressly set forth herein, whether express or implied by operation of law or otherwise including but not limited to any implied warranties of merchantability or fitness.

Seller shall not be liable for incidental or consequential losses, damages or expenses, directly or indirectly arising from the sale, handling or use of the goods, or from any other cause relating thereto, and seller's liability hereunder in any case

is expressly limited to the replacement (in the form originally shipped) of goods not complying with this agreement or at seller's election, to the repayment of, or crediting buyer with, an amount equal to the purchase price of such goods, whether such claims are for breach of warranty or negligence.

Any claim by buyer with reference to the goods sold hereunder for any cause shall be deemed waived by buyer unless submitted to seller in writing within thirty (30) days from the date buyer discovered or should of discovered, any claimed breach.

Materials should be inspected and tested by purchaser prior to their use if product quality is subject to verification after shipment. Performance guarantees are normally supplied by the applicator.

Note: Waterstop-RX is not an expansion joint material. Expansion joints shall be the responsibility of OTHERS.

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