DEWPOINT WATERPROOFING, INC.
P.O. Box 27
Sherrills Ford, NC 28673
Phone (704) 507-8051

Here are some facts on corrugated perforated single wall drain.

The flow rate is always a crapshoot because there are many variables regarding the flow of water into the perforations. The volume of water through a 6" pipe at full capacity would be approximately 70 gallons per minute. The hydrostatic pressure of water can easily be 500 pounds per square foot at minus 10' to 8' of elevation. This helps some water to flow into the perforations. I have experienced in my own testing that flow is much greater in the 6" to 12" strip drain when installed properly. The strip drain always allows full flow at face of strip into a 1" by 6" or 12" rectangular J-drain, allowing water to seek a quicker path to daylight.

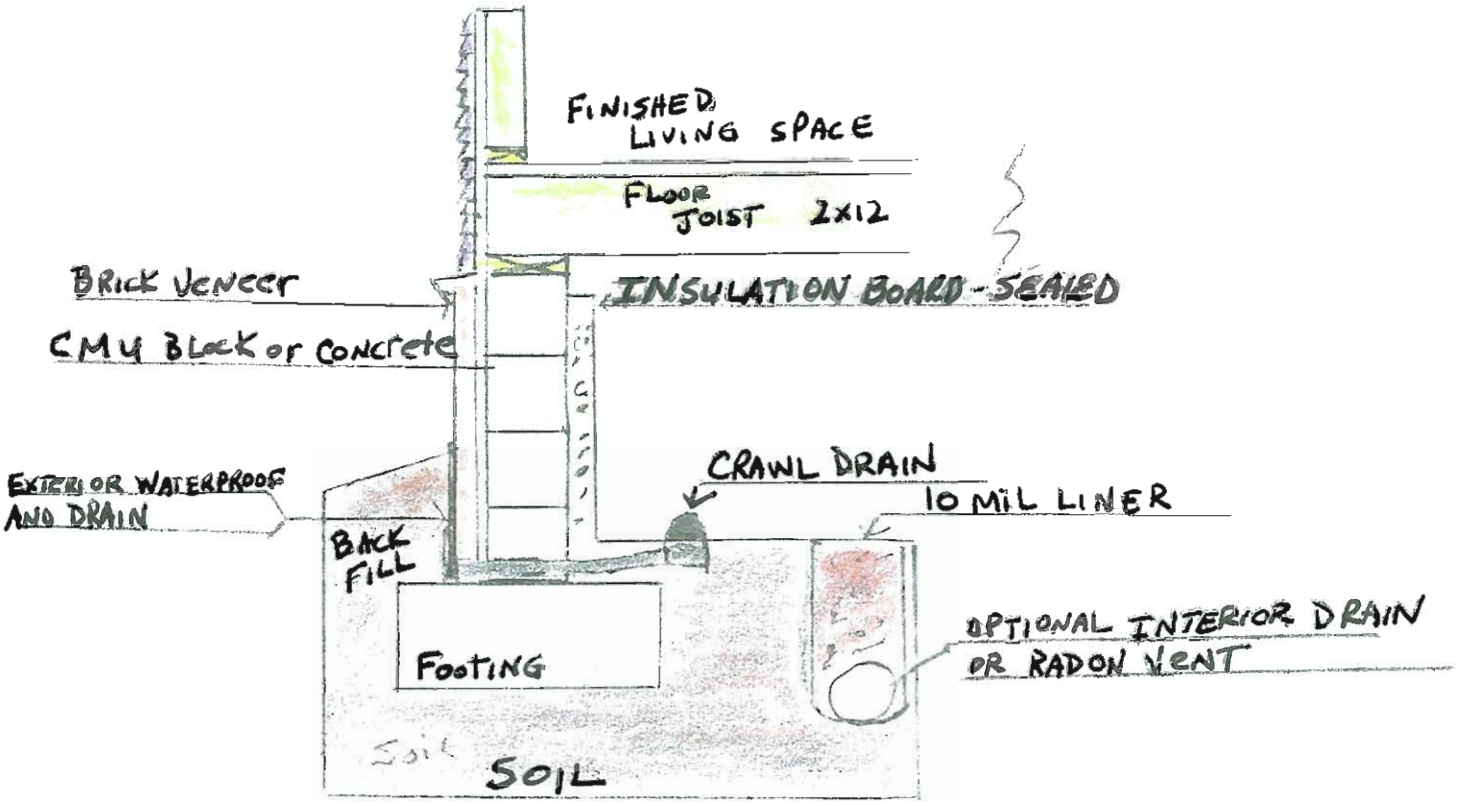
Please refer to installation specs.

Sincerely,

Phillip Stumphf

Dewpoint Sealed Crawl Experts

Call: 704-507-8051



Benefits:

- Improved air quality
- Better energy efficiency
- Higher comfort level
- Increased structure longevity
- Eliminates Mold and Mildew

Specifications:

- Multi-layer 10 mil class A vapor barrier
- Insulation resists fire and termites; permanently fastened to wall for long-term performance
- Low VOC, non-organic permanent adhesive sealant
- All liner joints permanently sealed with industrial polyolefin splice tape featuring a synthetic rubber adhesive

AMERICANWICKDRAIN CORPORATION
1209 Airport Road • Monroe, NC • 28110, USA
800 242-WICK • 704 238-9200 • Fax 704 296-0690
www.americanwick.com • info@americanwick.com

July 7, 2005

To Whom It May Concern:

Per ICC-ESR 1107, Akwadrain soil strip drain is approved for use in all soil types, including clays and silts. Because wall drainage is not required by residential code, Amerdrain is not mentioned in the same report however the products are made from the same components and have the same installation guidelines with regard to soil types. Please see the attached ICC Evaluation Service report as well as the Installation instructions (which are also referenced in the ICC ESR-1107, Section 6.1)

If you have any questions, please feel free to contact me.

Thank You,

Carolyn DeBoer

Carolyn DeBoer
Technical Specialist, Drainage Products
American Wick Drain Corporation

AKWADRAIN™ soil strip drain

Technical Data

PHYSICAL PROPERTIES	TYPICAL US VALUE	TYPICAL SI VALUE	TEST METHOD
FABRIC PROPERTIES			
Material	Polypropylene	Polypropylene	
Grab Tensile Strength	115 lbs	512 N	ASTM D-4632
Puncture Strength	70 lbs	311 N	ASTM D-4833
Trapezoidal Tear	50 lbs	222N	ASTM D-4533
Mullen Burst Strength	235 psi	1620 kPa	ASTM D-3786
Elongation	60%	60%	ASTM D-4632
EOS (AOS)	70 sieve	210 micron	ASTM D-4751
Permittivity	2.2 sec^{-1}	2.2 sec^{-1}	ASTM D-4491
Flow Rate	150 $g/min/ft^2$	6111 $L/min/m^2$	ASTM D-4491
UV Resistance (After 500 hrs.)	70%	70%	ASTM D-4355
DRAIN PROPERTIES			
Peel Strength	38 lbs/ft^2	1.8 k N/m^2	ASTM D-1876
Compressive Strength	6,000-9000 lbs/ft^2	287-455 kN/m^2	ASTM D-1621 (Mod.)
Shear Strength	6,000-9000 lbs/ft^2	287-455 kN/m^2	ASTM D-1621 (Mod.)
Fungus Resistance (Core)	No Growth	No Growth	ASTM G-21
Unobstructed Inflow Area (Primary Side)	85%	85%	
In-Plane Flow (Hydraulic gradient=0.1, Loading=10 psi)	21 gpm/ft width	261 Lpm/m width	ASTM D-4716

DIMENSIONAL PROPERTIES

	6"x150'	*12"x150'*	*12"x600'*	*18"x150'*	*18"x500'*	*24"x150'*	*24"x500'*	*36"x100'*
Thickness (in)	1	1	1	1	1	1	1	1
Widths (in)	6	12	12	18	18	24	24	36
Roll Length (ft)	150	150	500	150	500	100	500	100
Roll Diameter (ft)	5	5	7	5	7	5	7	3.5
Roll Weight (lbs)	24	48	160	72	240	64	320	96

All information, drawings and specifications are based on the latest product information available at the time of printing. Constant improvement and engineering progress make it necessary that we reserve the right to make changes without notice. All physical properties are typical values. Standard variations in mechanical properties of 10% and in hydraulic properties of 20% are normal.

AMERICAN WICK DRAIN CORPORATION
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800 242-WICK • 704 238-9200 • Fax 704 296-0690
www.americanwick.com • info@americanwick.com

AMERDRAIN® SOIL SHEET DRAIN
INSTALLATION INSTRUCTIONS
USING AKWADRAIN™

REQUIRED MATERIALS

1. AKWADRAIN soil strip drain 6"x 50' rolls*.
2. AMERDRAIN sheet drain 4'x 25' rolls*.
3. AKWADRAIN Fittings
4. 3" wide underground or duct tape
5. Attachment materials (see below)
6. Knife or scissors, rubber hammer.

** Additional roll lengths and widths are available.*

DRAIN ATTACHMENT METHODS

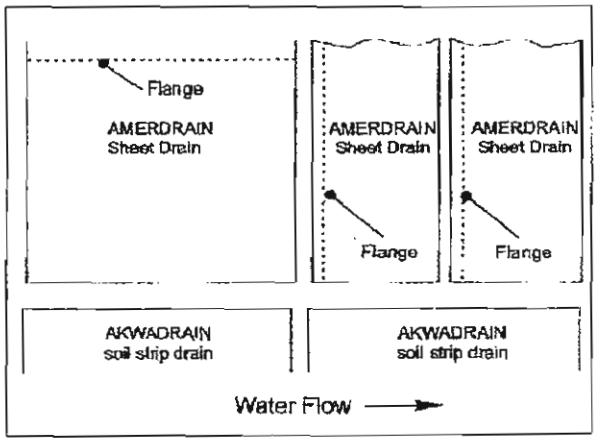
For attaching drain to waterproofing material, concrete or wood, several methods may be used including metal stick pins, nails driven through washers or wood lathing, construction adhesives, double sided tape or mechanical fasteners. Discuss materials compatibility with waterproofing supplier before using adhesives. Typically any method used for attaching waterproofing protection board will work for drain.

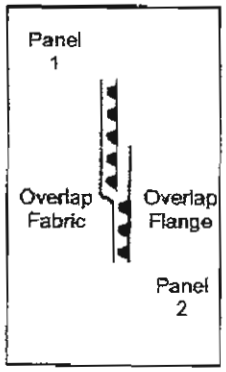
ATTACHING THE FIRST ROLL OF AMERDRAIN

VERTICAL WALLS:

AMERDRAIN may be installed starting at either the top or bottom of the wall. The roll may be installed vertically (perpendicular to the footing) or horizontally (parallel to the footing).

When installed vertically, the flange should be facing the direction opposite of the water flow. When installed horizontally, the edge of the core with the flange should be at the top, similar to roof shingle applications.





Shingle Detail

Fold back edge of fabric on lower (or downstream) drain. Do not detach from dimples. Place cones of upper (upstream) drain over flange of lower drain. Overlap fabric of upper drain over lower drain. Seal seam with 3" tape.

For either method, overlap fabric in direction of water flow. Use tape or spray adhesive, if necessary, to keep fabric at joint in place prior to backfilling. All edges of drain should have extra fabric tucked behind core for edge seal to prevent soil from entering core.

Figure 1 - Install AMERDRAIN sheet drain 6" from the top of backfill to the base of the footer. Peel the fabric away from the bottom of the sheet (approximately 8"). Place the AKWADRAIN 6" strip drain next to the core of the sheet drain, dimples facing the core, and wrap the fabric around the strip drain and tuck to secure.

Figure 2 - The AMERDRAIN sheet drain can be extended around the base of the footer. Install the AKWADRAIN at the base of the footer following the same steps as detailed above.

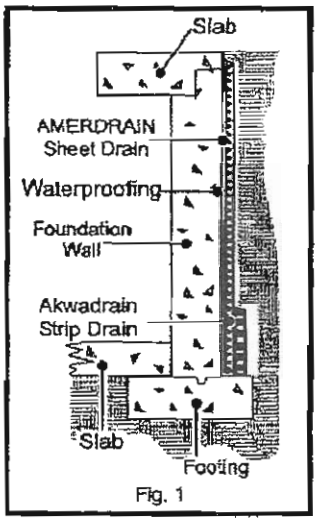


Fig. 1

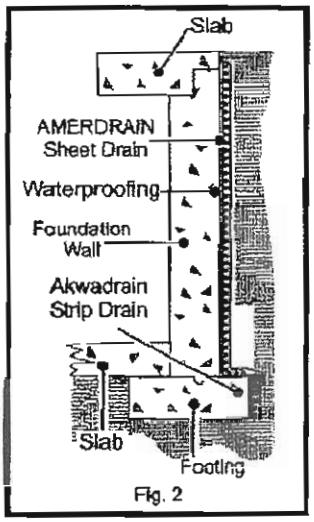
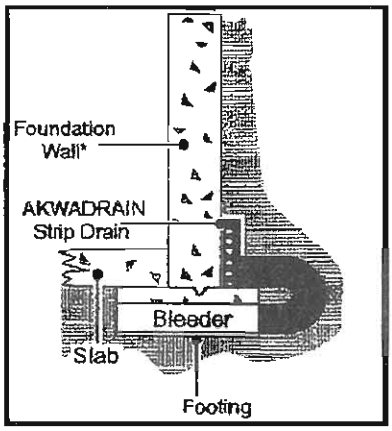
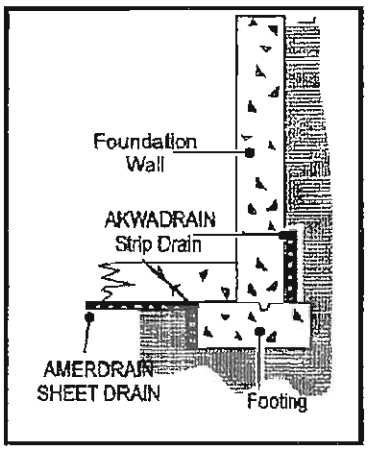
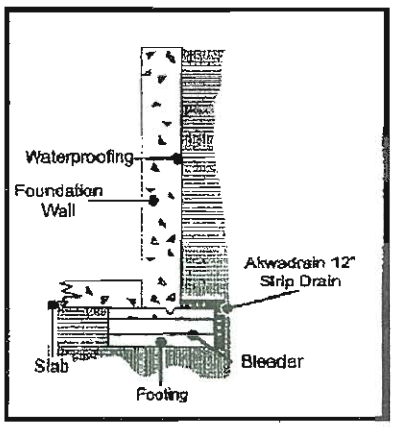


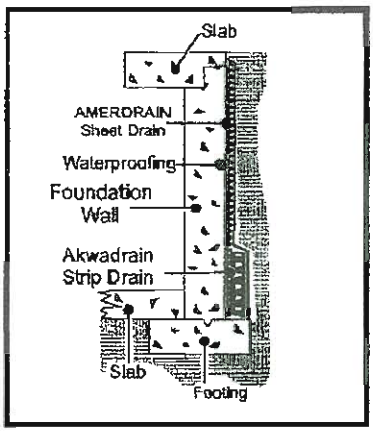
Fig. 2

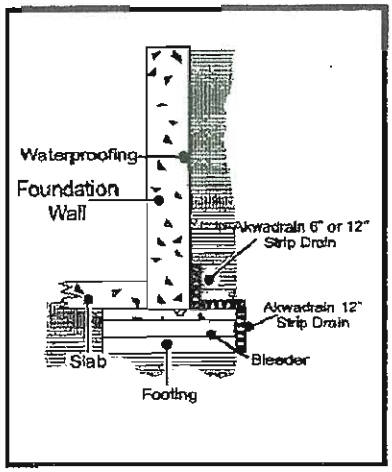
Alternative Details





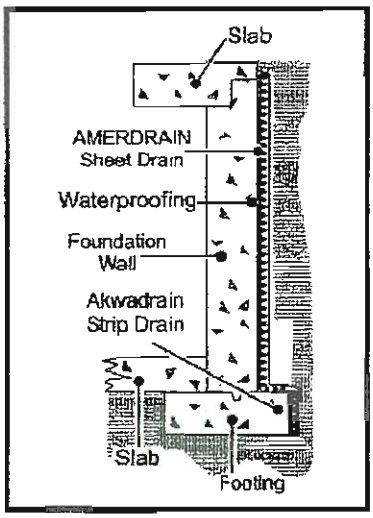






NER-569

*Foundation Walls include all types (concrete, block, wood, etc).



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COMMERCIAL DRAINAGE PRODUCTS

PRODUCT DATA

Division 7

Drainage Board Type II™ is a high-flow dimpled core bonded to a single layer of non-woven filter fabric. Type II is designed as a commercial composite drainage and is intended for both vertical and horizontal application.

Drainage Board Type III™ consists of a heavy-duty, high-density polyethylene geonet drainage core with a coated filter fabric on both sides. Type III is ideal for flat decking, retaining walls and bridge abutments.

DRAIN-A-WAY™ 12" is a drainage and collection system consisting of a thick dimpled drainage core completely wrapped with a filter fabric. It is used for the collection and disposal of water and replaces the pipe and gravel drains on foundations and retaining walls.

Composite Drainage Properties[1]

PRODUCT (ROLLS)	THICKNESS	COMPRESSION psf	FLOW RATE gpm/ft. width
TYPE II SIZE: 4' X 50'	.40?	15,000	1:15
TYPE III SIZE: 4' X 50'	.25?	30,000	1:7
DRAIN-A-WAY 12? SIZE: 12? X 165'	1?	7,500	1:30

Geo-Mat™ Plus is made of a high-density polyethylene (HDPE) with an attached polypropylene geotextile mat. Designed to provide excellent protection and drainage.

Geo-Mat Plus Properties[1]

PRODUCT (ROLLS)	THICKNESS	COMPRESSION lb/in	FLOW RATE gpm/ft. width
GEO-MAT PLUS SIZE: 8' X 50'	.2968?	>29	30.1

DRAIN & DRY BOARD is a semi-rigid thermal insulation board made from inorganic glass fibers, preformed into boards, and bonded by a thermo setting resin. It is intended for use in conjunction with Mar-flex waterproofing membranes. It is available in thermal values of R-3.1 to R-10.0, to meet the needs of builders, energy conscious homebuyers and/or local building codes.

Drain & Dry Board Properties[1]

PRODUCT (BOARD)	R-VALUE	COMPRESSION lb/in	FLOW RATE GHL
3/4? SIZE: 3' X 4'	3.1	46.8	126.8
1-3/16" SIZE: 3' X 4'	5.0	22.72	249.1
2-3/8? SIZE: 3' X 4'	10.0	30.72	291.4

QuickSilver Foundation Drainage Board is constructed of expanded polystyrene with a 1-mil metallic polypropylene laminate on one side and a 1-mil clear laminate on the other side. Each board features 22 slots, 0.03125" from top to bottom with a depth of ¼".

QuickSilver Properties

PRODUCT (BOARD)	R-VALUE	COMPRESSION lb/in^2	FLOW RATE GHL
3/4" SIZE: 3' X 4'	2.8	10	11.7
1-3/8" SIZE: 3' X 4'	5.1	10	11.7
2-3/4" SIZE: 3' X 4'	10.2	10	11.7

HEALTH AND SAFETY INFORMATION IS GIVEN IN THE MATERIAL SAFETY DATA SHEET AVAILABLE FOR THIS PRODUCT. THE MATERIAL SAFETY DATA SHEET SHOULD BE READ AND UNDERSTOOD BEFORE USING THIS PRODUCT.

Mar-flex Waterproofing and Basement Products
6866 Chrisman Lane, Middletown, OH 45042
(800) 498-1411| (513) 422-7285 | Fax – (513) 422-7282
E-mail: keepdry@mar-flex.com
Web-site: www.mar-flex.com
Rev. 10/07

[1] ASTM Methods Available Upon Request

Drain-A-Way 6"™

PRODUCT DATA

Division 7 - 07120

PRODUCT DESCRIPTION
Drain-A-Way 6" is a three dimensional, high-flow, drainage core that is wrapped with a non-woven filter fabric.

Drain-A-Way 6" is part of a modular drainage system and water collection system for basements, foundations and retaining walls.

PURPOSE:
Drain-A-Way 6" is designed to replace conventional gravel covered corrugated pipe used for drainage around foundation and retaining walls.

ADVANTAGES:
- Lightweight and easy to install
- Cost effective
- Code approvals
- Saves time and labor

SPECIFICATION:
- Color – Black with black filter fabric
- Thickness –ASTM D-1777 – 1"
- Compression Resistance –

ASTM D-1621 –9,500 psf
- Drainage Capacity -

ASTM D-4716 –170 gpm/ft.width

PACKAGING:
6' x 165' Rolls

COVERAGE:
165/lin.ft./roll

ACCESSORIES:
Use the fittings to transition the Drain-A-Way 6" to a corrugated 4" corrugated pipe for moving the collected water away from the foundation to a sump pump or daylight.

6" END OUT CONNECTOR
Used to make the connection from the Drain-A-Way 6" to a corrugated 4" corrugated pipe.

6" SIDE OUT CONNECTOR
Used to make an in line connection of the Drain-A-Way 6" with a corrugated 4" drain pipe.

6" SPLICE CONNECTOR
Used to connect two sections of the Drain-A-Way 6" either vertically or horizontally.

6" END CAP
Used to cover the cut end of the Drain-A-Way 6".

6" STEP-DOWN CONNECTOR
Used to connect two sections of the Drain-A-Way 6" on a vertical stepped foundation.

6" CORNER CONNECTOR
Used to connect two sections of the Drain-A-Way 6" on either an inside or outside corner.

PREP/APPLICATION:
Apply one of the Mar-flex waterproofing systems to the foundation wall.

Determine the location that the fittings will be needed. Cut the Drain-A-Way 6" to the proper length between fittings, allowing extra length for the insertion into the fittings. NOTE: It is recommended that fittings be taped to the Drain-A-Way 6" for filter continuity.

The fittings and the Drain-A-Way 6" can be adhered to the side of the footer with Mar-flex Mastic, a panel adhesive or an insulation board adhesive. If needed, a mechanical fastener can be used. Note: Place a fastener through a dimple to prevent disruption of the water flow.

Note: Drain-A-Way can be placed with either side against the wall.

Connect fittings to a 4" corrugated pipe and run them out to a sump pump or to daylight. NOTE: Special care should be taken to properly compact the soil under the drainpipe to prevent settling of drainpipe.

CLEAN UP:
Disposal methods must be in compliance with all federal, state and local laws and regulations.

PRODUCT HANDLING/STORAGE:
- Do not smoke while handling
- When installing wear respirator
- No special storage requirements
- Wash thoroughly with soap and water after handling

WARNING/DANGERS:
- Keep away from sparks, open flames, or any heat source
- Dust might create mechanical irritation

Product Only Warranty:
We warrant the product to be of good quality and manufactured to meet published physical properties and quality control standards.

Except as specifically provided herein, Mar-Flex makes no warranty, express, implied or oral including but not limited to any warranty or merchantability, fitness for a particular purpose, usage of trade, course of dealing or course of performance in connection with this agreement. In no event shall Mar-flex be liable on any such warranty with respect to the product. Mar-flex shall not be liable for incidental or consequential damages including, but not limited to damages of the structure, its replacement, contents or personal injury. Some states do not allow limitations on how long an implied warranty lasts or allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

HEALTH AND SAFETY INFORMATION IS GIVEN IN THE MATERIAL SAFETY DATA SHEET AVAILABLE FOR THIS PRODUCT. THE MATERIAL SAFETY DATA SHEET SHOULD BE READ AND UNDERSTOOD BEFORE USING THIS PRODUCT.

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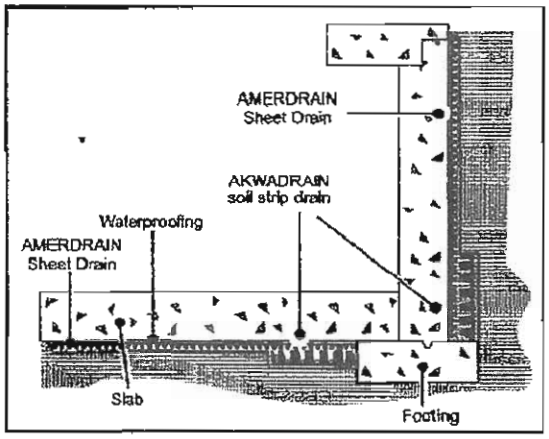
E-mail: keepdry@mar-flex.com | www.mar-flex.com

Rev. 3/07

AMERDRAIN® / AKWADRAIN™
INSTALLATION INSTRUCTIONS

INSTALLATION UNDER SLABS

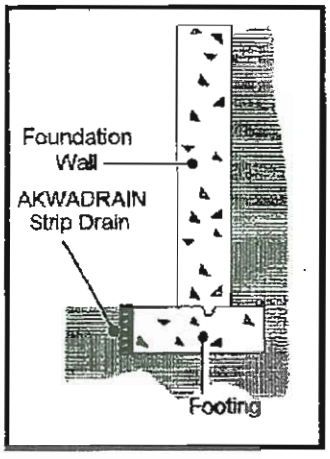
For under floor slab installation, position AMERDRAIN sheet drain as shown with geotextile to soil side. Attach sheet drain as required or the same as for vertical wall with AKWADRAIN around the interior perimeter as shown. Waterproofing and/or floor slab can be applied directly to the back of the core.

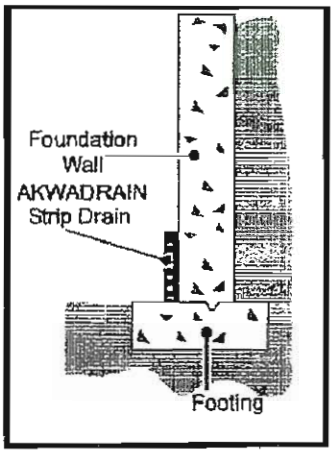


SEALING EDGES:
All edges of drain should be sealed to prevent soil from entering the core. Tape edges or secure fabric around edge and seal.

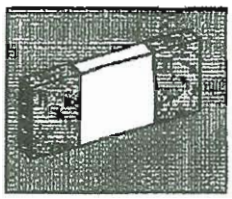
AKWADRAIN soil strip drain can be used alone at the base of the wall or footer as a replacement for pipe and stone for interior or exterior drainage.

Install AKWADRAIN in a vertical position at the base of the foundation wall. Hold in place using mastic, adhesives or mechanical fasteners. Drain must be installed continuously around the perimeter.

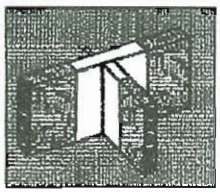




AKWADRAIN FITTINGS

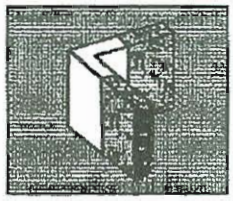


6" Splice
Connects two sections of AKWADRAIN together.

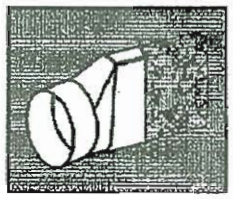


6" Tee
Connects three strips of AKWADRAIN together

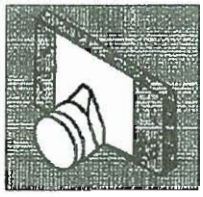
6" Corner Guard
Maintains flow around corners. Slit fabric, bend drain around corner and tape guard over slit to prevent soil intrusion.



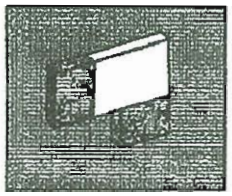
6" Corner Fitting
Insert strip sections into outlet to maintain flow around corner. Tape fitting edge to prevent soil intrusion.



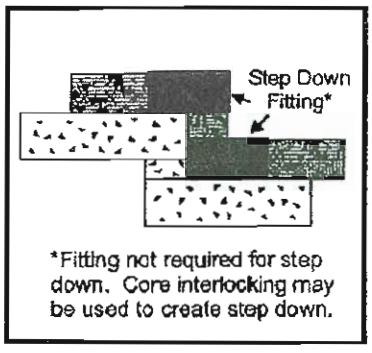
6" End Outlet
Insert strip into outlet. Tape fitting edge to prevent soil intrusion. Outlets transition to 4" pipe. Universal Outlet available for 12" width drain.



Universal Tee Outlet
Notch a triangle in the bottom section of the strip. Slip the tee base over the notch and secure with tape to prevent soil intrusion.



6" Step Down
Insert strip into openings as shown in detail. Tape all connections to prevent soil intrusion.



*Fitting not required for step down. Core interlocking may be used to create step down.

End Cap: To terminate AKWADRAIN Strip Drain, pull back fabric to expose two rows of dimpled core. Cut exposed core, leaving extra fabric in place. Fold fabric and tape to prevent soil intrusion.

ESR-1107
Issued July 1, 2004
This report is subject to re-examination in one year.

ICC Evaluation Service, Inc.
www.icc-es.org

Business/Regional Office ■ 5360 Workman Mill Road, Whittier, California 90601 ■ (562) 699-0543
Regional Office ■ 900 Montclair Road, Suite A, Birmingham, Alabama 35213 ■ (205) 599-9800
Regional Office ■ 4051 West Flossmoor Road, Country Club Hills, Illinois 60478 ■ (708) 799-2305

DIVISION: 02—SITE CONSTRUCTION
Section: 02620—Subdrainage

REPORT HOLDER:

AMERICAN WICK DRAIN CORPORATION
1209 AIRPORT ROAD
MONROE, NORTH CAROLINA 28110
(704) 238-9200
www.americanwick.com
info@americanwick.com

EVALUATION SUBJECT:

AKWADRAIN™ FOUNDATION STRIP DRAIN

ADDITIONAL LISTEES:

EPRO SERVICES, INC.
PO BOX 347
DERBY, KANSAS 67037
(316) 262-2513
eproserv@aol.com

TREMCO BARRIER SOLUTIONS, INC.
6402 EAST MAIN STREET
REYNOLDSBURG, OHIO 43230
(614) 322-4420
www.tremcoinc.com
wellsja@tremcoinc.com

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2003 *International Building Code®* (IBC)
- 2003 *International Residential Code®* (IRC)
- 1997 *Uniform Building Code™* (UBC)
- BOCA® *National Building Code*/1999 (BNBC)
- 1999 *Standard Building Code®* (SBC)

Property evaluated:

Foundation drainage system

2.0 USES

AKWADRAIN™ Foundation Strip Drains are used as alternatives to conventional sand- or gravel-covered pipe drains installed around building foundations in accordance with the applicable code.

3.0 DESCRIPTION

3.1 General:

AKWADRAIN™ Foundation Strip Drain is a composite drainage system consisting of a three-dimensional drainage core and a nonwoven, needle-punched filter fabric and fittings. The filter fabric is wrapped around and bonded to the drainage core, preventing intrusion of backfill material and the filter fabric into the flow channels during backfilling. Soil particles are held back by the filter fabric, allowing water to pass through to the drainage core.

AKWADRAIN™ Foundation Strip Drain is 1 inch (25.4 mm) deep, and is available in standard nominal widths of 6, 12, 18, 24 and 36 inches (152, 305, 457, 610 and 914 mm, respectively) and roll lengths of 50 feet (152 m) to 500 feet (1524 m).

3.2 Components and Fittings:

3.2.1 Rigid Core: The Rigid Core component of the AKWADRAIN™ Foundation Strip Drain is thermoformed from a black extruded plastic to form an internal dimpled drainage core with a 1-inch (25.4 mm) depth.

3.2.2 Filter Fabric: The Filter Fabric component of the AKWADRAIN™ Foundation Strip Drain is a geotextile, made from polypropylene, that is black in color, nonwoven and needle-punched for water flow.

3.2.3 Splice Fitting: Splice fittings are used to connect rolls of AKWADRAIN™ together using a minimum 3-inch-wide (76 mm) polyethylene tape at each joint.

3.2.4 Tee Fitting: Tee fittings are used to join one run or branch of AKWADRAIN™ to another at a 90-degree angle. A minimum 3-inch-wide (76 mm) polyethylene tape is used to secure each joint.

3.2.5 Outlet Fitting: The Outlet Fitting is a black plastic fitting used to connect AKWADRAIN™ to the drainage piping, using a minimum 3-inch-wide (76 mm) polyethylene tape at the joint.

3.2.6 Corner Fitting: The Corner Fitting is a black plastic fitting used to connect AKWADRAIN™ sections around an inside or outside corner at a 90-degree angle. A minimum 3-inch-wide (76 mm) polyethylene tape is used to secure each joint.

3.2.7 Corner Guard Fitting: The Corner Guard is a black plastic fitting with polypropylene nonwoven geotextile bonded to plastic. The fitting is used as an alternative to the corner fitting to allow the bending of AKWADRAIN™ around an inside or outside corner at a 90-degree angle. A minimum 3-inch-wide (76 mm) polyethylene tape is used to secure each joint.

3.2.8 Step Down Fitting: The Step Down Fitting is a black plastic fitting used with AKWADRAIN™ to facilitate changing vertical height along a foundation. A minimum 3-inch-wide (76 mm) polyethylene tape is used to secure each joint.

3.2.9 Universal Fitting: The Universal Fitting is a black plastic fitting with polypropylene nonwoven geotextile bonded

to the plastic, and is used to connect various widths of AKWADRAIN™ to the drainage piping. A minimum 3-inch-wide (76 mm) polyethylene tape is used to secure each joint.

4.0 INSTALLATION

Prior to AKWADRAIN™ Foundation Strip installation, waterproofing or dampproofing shall be installed on the below-grade foundation or retaining wall in accordance with the applicable code. AKWADRAIN™ drainage material shall be unrolled along the footing at the base of the wall parallel to the length of the wall. The Filter Fabric adheres to the partially cured waterproofing or dampproofing. When AKWADRAIN™ is applied to cured waterproofing, dampproofing or concrete foundations, an adhesive compatible with the drainage material, or mechanical means (i.e., insulation anchors as specified by the waterproofing or dampproofing manufacturer), shall be used to hold the drain system in place. An outlet fitting shall be attached to the end of the AKWADRAIN™ Foundation Strip Drain, and a 4-inch-diameter (102 mm) plastic pipe complying with the applicable plumbing code is attached to the outlet fitting. The AKWADRAIN™ Foundation Strip Drain perimeter drain shall discharge by gravity or mechanical means into an approved drainage system that complies with the applicable plumbing code. The below-grade foundation or retaining wall shall then be backfilled and compacted to the density required by the applicable code.

The AKWADRAIN™ Foundation Strip Drain shall be installed in accordance with this report and the manufacturer's published installation instructions. Where the manufacturer's published installation instructions and this report differ, this report shall govern.

5.0 CONDITIONS OF USE

The AKWADRAIN™ Foundation Strip Drain as described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 The manufacturer shall submit installation instructions for the AKWADRAIN™ Foundation Strip Drain at the time of permit application.

5.2 When adhesives are used to attach the AKWADRAIN™ Foundation Strip drainage system to foundation or retaining walls, American Wick Drain Corporation shall verify compatibility of the adhesives with the drainage system.

6.0 EVIDENCE SUBMITTED

6.1 Installation instructions.

6.2 Data in accordance with the ICC-ES Acceptance Criteria for Composite Foundation Drainage Systems (AC243), dated February 2004.

6.3 A quality control manual.

7.0 IDENTIFICATION

Each package of the AKWADRAIN™ Foundation Strip Drain shall be identified with the name and/or trademark and the address of American Wick Drain Corporation or one of the report listees, as indicated in Table 1 of this report; the product name; and the evaluation report number (ESR-1107).

TABLE 1—COMPANY NAME/PRODUCT NAME CROSS-REFERENCE

COMPANY NAME	PRODUCT TRADE NAME
American Wick Drain Corporation	AKWADRAIN™
Epro Services, Inc.	EGODRAIN-DS™
Tremco Barrier Solutions, Inc.	DrainStar®