Biobarrier® Root Control

Installation Guidelines

THESE GUIDELINES MUST BE FOLLOWED IN ALL BIOBARRIER® INSTALLATIONS. REFER TO PAGE 5 FOR INDEX OF SPECIFIC INSTRUCTIONS

- Wear chemical resistant gloves when handling Biobarrier® to prevent staining.
- See product label and SDS for further information.
- **Do not allow gaps in fabric during installation or backfilling.**
- Many severed roots can regenerate, so they should always be completely removed. If removal is not possible, a systemic herbicide must be applied to severed roots to prevent re-growth. The systemic herbicide should be carefully applied, according to manufacturer directions, insuring that it does not come in contact with existing tree roots. This could damage or kill the tree.
- When joining two pieces of Biobarrier®, be sure they do not become separated at any point. Seaming can be accomplished by using construction adhesive and/or overlapping. If the latter is used, seams should be overlapped at least 3 inches (or 2 nodule widths). Sod pins may also be used for seams, but make sure there are no gaps.
- Biobarrier® should not be left exposed to surface water or sunlight.
- Biobarrier® products are for non-food uses only.

Biobarrier® stops roots within ~1 inch of a nodule. Proper placement is very important. It is only effective where it is!

For Technical Assistance on any of these applications, call 1-800-25ROOTS EXT. 7500

BIOBARRIER®

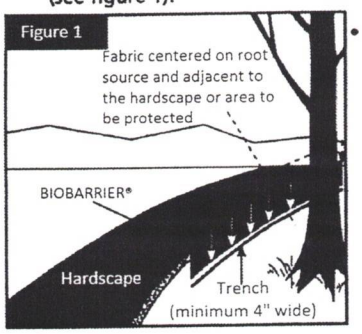
Installation Instructions for Vertical Installation

BEFORE YOU START:
- Contact your utility company prior to trenching if you suspect service lines are present. Consult a professional arborist if root trimming is required.
- Follow all EPA label instructions located on the box and yellow packaging sleeve when installing product. Additional instructions in box.

IMPORTANT NOTES:
- Biobarrier should be installed on the side of the trench opposite the root source.
- Install and cover Biobarrier as soon as possible (within 12 hours) after opening sealed yellow bag; high temperatures and direct sunlight can reduce effective product life.

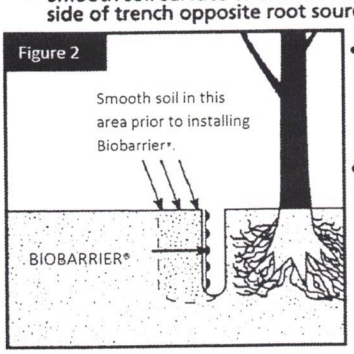
INSTALLING THE PRODUCT:
- Cut a trench a minimum of 4 inches (100mm) wide and at least equal to the length of mature tree canopy plus 10 feet, centered on the root source and adjacent to the structure using clean-cutting trench digging equipment (see figure 1).

Figure 1



- Cut all roots back flush to trench walls on both sides of trench. For some species, it may be necessary to spray the cut end of the severed root on the side opposite tree to prevent root regrowth under the hardscape. If this is necessary, use a systematic herbicide and be extremely careful to avoid contact with roots on the opposite side of the trench.
- Smooth soil surface to desired FINAL GRADE LEVEL on side of trench opposite root source (see Figure 2).

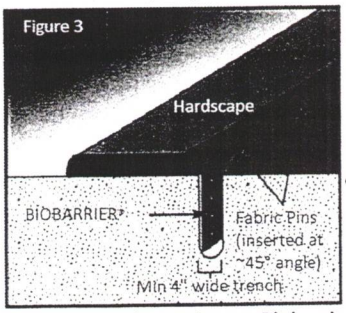
Figure 2



- CAREFULLY open yellow bag of Biobarrier on one end to prevent damage. Use yellow bag to store any unused product.
- Roll out Biobarrier and trim to proper length. Place excess material back in yellow bag and seal tightly with spare ties provided.
- Beginning at one end of the trench, hold product in place at finished grade level on the side of the trench adjacent to the hardscape (opposite root source) and stake in position using pins provided. Use Caution when handling installation pins - they are sharp.

  Pins should penetrate fabric between the nodules ~1/4" from the top edge of the fabric and at ~45 degree angle to the trench wall (see Fig. 3). Enough pins are provided to secure fabric every 2 feet. The top edge of the product must be at finished grade level for the entire length of the installation.

Figure 3



- Backfill and tamp firmly to eliminate soil settling. Wet soil, if necessary, to ensure proper soil compaction.

For more information on Biobarrier, or for technical assistance, call toll-free:

1-800-25ROOTS ext. 7500

NOTE:
These guidelines treat a typical urban sidewalk application. Other installations such as property lines, building foundations, retaining walls, ornamental beds, septic systems, storm drains, etc. may require minor procedural adjustments.

BIOBARRIER®

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www.biobarrier.com

Made in the USA

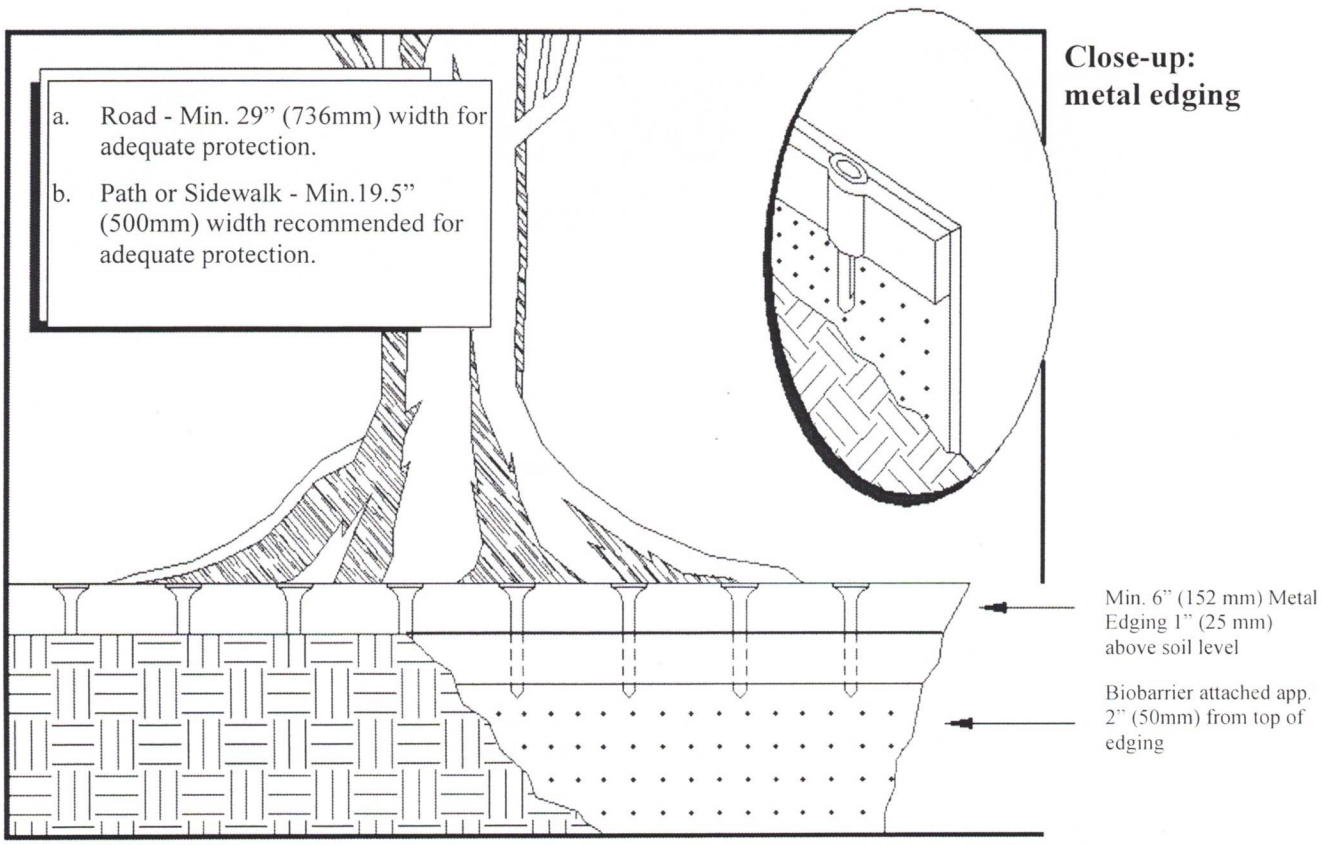
SPECIAL INSTALLATION INSTRUCTIONS (for unusual situations)

When two or more of the following conditions exist, special precautions, detailed below, should be followed for maximum prevention of root overgrowth of fabric.

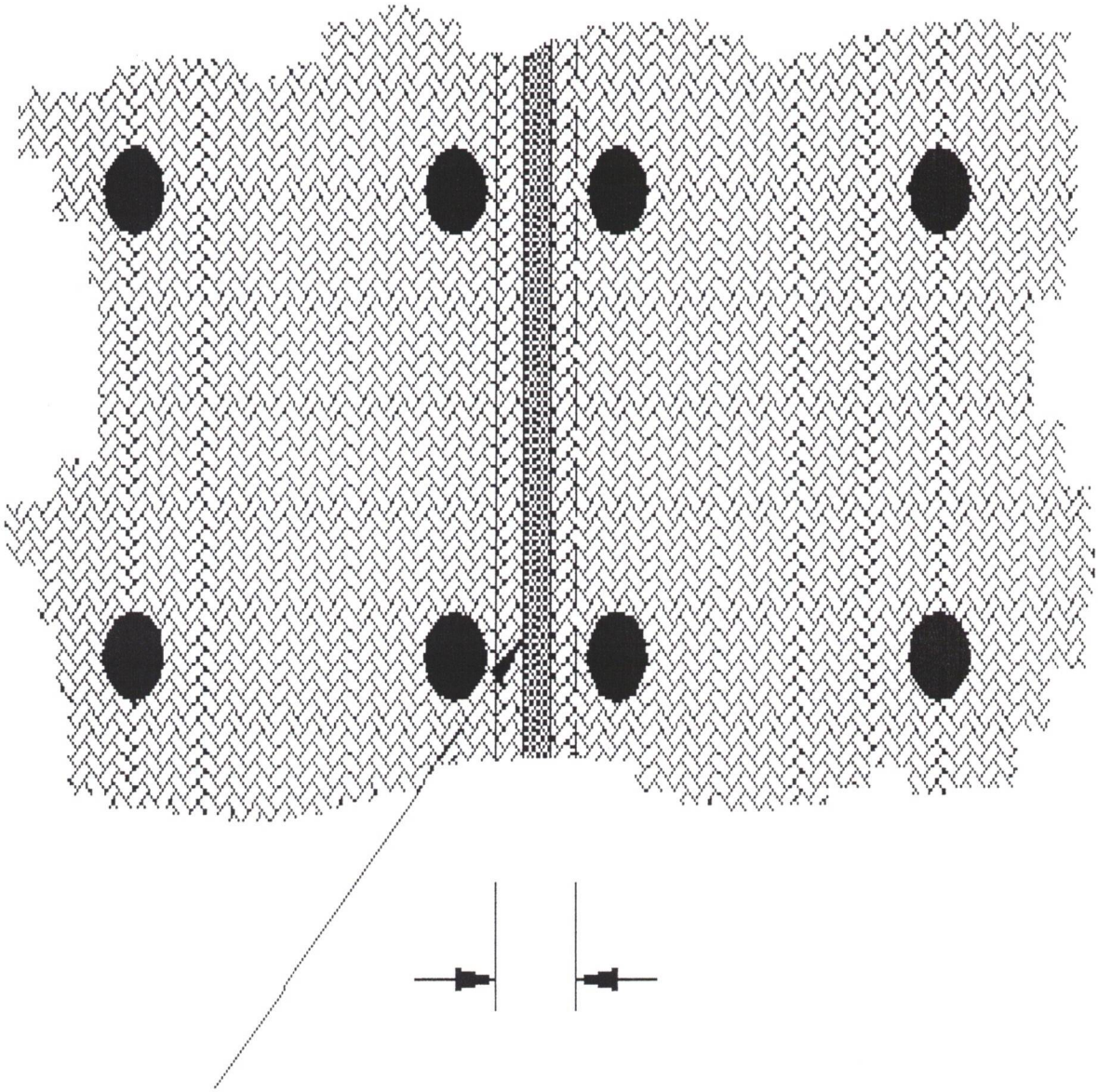
1. Base of potential problem tree is higher than protected hardscape
2. Soil is over 90% sand
3. Tree species is aggressive, top rooting variety such as maple, ficus, etc. Consult a local arborist for species questions or recommendations if necessary.
4. Tree is closer than eight feet (2400mm) from edge of protected hardscape.

Special Precautions (See Drawing Below)

1. Wherever practical, build level of soil adjacent to protected hardscape to a level even with or above base of tree.
2. Attach Biobarrier® approximately two inches (50 mm) from the top edge of commercially available metal edging using hot or cold adhesive. For hot application use general adhesives hot melt #64x884 or equivalent. For cold applications use Macco adhesives "Fix-n-Seal" high performance clear sealant F S- U S, Prod. No. 1450113 or equivalent.
3. Install metal edging adjacent to protected hardscape with Biobarrier® attached. Leave metal edging approximately one inch above grade to prevent root overgrowth. Edging should extend a minimum of 10 feet (3000mm) in each direction from center of tree. Landscape timbers with Biobarrier® attached to the bottom may be substituted for edging.



Biobarrier® Seaming Instructions



↑ 3" (75mm) Min. Overlap Ends

Continuous 6mm Wide Bead

Hot Application
General Adhesive Co. Hot Melt #64 x 884 or equivalent

Cold Application
Macco Adhesives Liquid Nails Heavy-Duty Adhesive LN-901 or equivalent

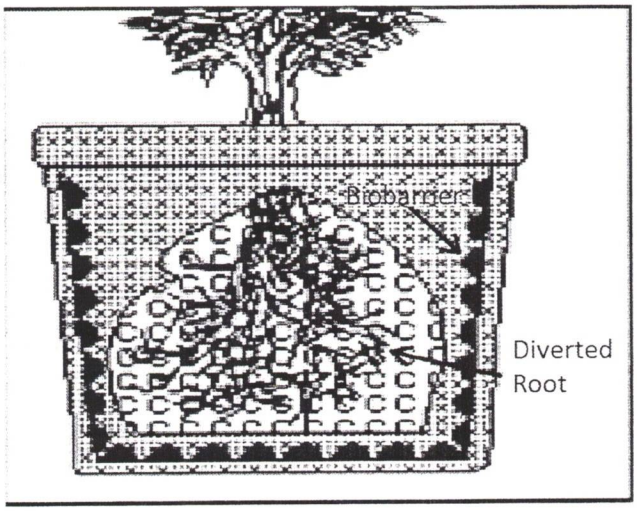
See Detailed Instructions Attached for These Installation Types

This chart is a general guide only. Your specific applications may require slightly different sizes.

Application	Pg. #	Biobarrier® Recommended Depth				
		12.0" (30 cm)	19.5" (50 cm)	29.0" (74 cm)	39.0" (99 cm)	58.5" (149 cm)
Bunkers	8		•	•		
Canals	7					•
Containers	6			•	•	•
Curbs	11		•			
Dikes	7					•
Drain Lines	6	•	•	•	•	•
Earth-Filled Dams	7					•
Foundations	7			•	•	•
Golf Greens	8			•	•	
Landfills	8					•
Medians	11		•	•		
Pipes	6	•	•	•	•	•
Planting Beds	9		•	•	•	•
Pot 'N Pot	9	Sold In	6" x 12"	Swatches		
Pots	9	•	•			
Retaining Walls	10				•	•
Roof Gardens	9				•	•
Septic Tanks	10					•
Sidewalks	11		•	•		
Paths	11		•	•		
Streets	11		•	•		
Swimming Pools	11		•	•	•	
Tennis Courts	11		•	•	•	
Underground Storage Tanks	12					•
Utility Lines	6			•	•	•
Vaults	12					•

Containers

Line planting container with Biobarrier®, placing material vertically at finished grade level, allowing it to drape down side, across bottom and up opposite side, ending at finished grade level. Pins or tape can be used to hold material in place. Depending on container size, it may be necessary to seam two or more widths together (see page 4).

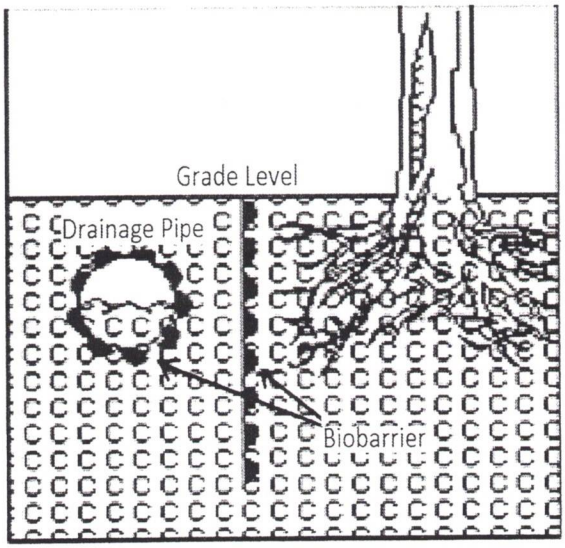


If container has a dirt bottom and roots are permitted to grow downward, product may be placed only around sides of container, attaching at top finished grade level. Width of product should be equal to, or greater than, the depth of container.

Biobarrier® is used in planting pots to prevent roots from growing through drain holes. The bottom of the pot should be covered with drainage medium, and then covered with Biobarrier®, permitting water to pass, but stopping roots.

Refer to Guidelines, Page 1

Drain Lines, Utility Lines & Pipes

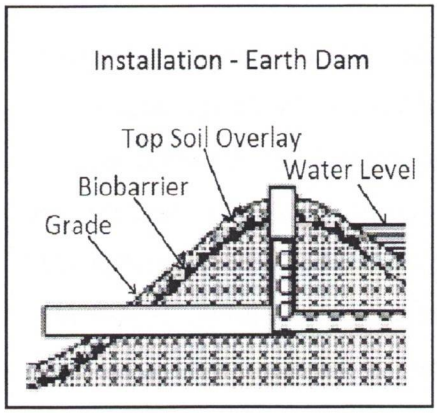


Drain lines and systems and utility lines and pipes can be protected from root intrusion by wrapping entirely with Biobarrier®, at joints or on any or all sides. Biobarrier® fabric can be easily cut with a knife or scissors to fit any configuration. Pipes may be completely wrapped lengthwise and overlapped (minimum of 3 inches or 2 nodules) or at joints or other critical locations where moisture or air may attract roots. Pins, industrial tape or adhesives, or plastic or metal bands may be used to hold Biobarrier® in position...remember, no gaps, it is only effective "where it is."

Refer to Guidelines (Pg. 1) & Vertical Instructions (Pg. 2)

Earth Dams, Dikes, Canals

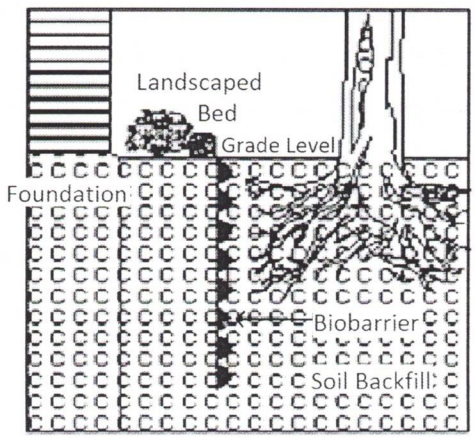
Biobarrier® can be used to prevent root intrusion into earth-filled structures and drain systems associated with dams, dikes and canals. For large areas, lengths of Biobarrier® can be seamed together using hot or cold melt adhesives (see Seaming Instructions, page 4). Pinned, overlapped seams can also be used. Biobarrier® is then placed over the area to be protected and covered to any depth with fill or other cover material, which can then 'naturalize' with surface vegetation without fear of tree root intrusion. Biobarrier® can be used underneath canals to prevent root intrusion. Biobarrier® must not come in direct contact with surface water. There can be no gaps as the effective zone for stopping roots is 1 inch from the nodules. In new construction, it is advantageous to substitute Biobarrier® Root Control in place of most drainage fabrics since the geotextile in Biobarrier® is a standard AASHTO drainage fabric.



Refer to Guidelines, Page 1

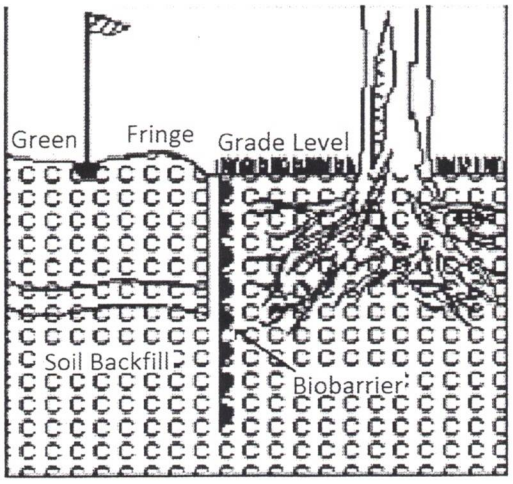
Foundations

Dig a trench where Biobarrier® is to be installed, pruning the roots of existing trees if necessary. Distance of trench from foundation should be sufficient to allow for roots to swell without compromising structure. Place Biobarrier® in the trench, securing with installation strips and/or pins provided. Backfill the trench, and compact the dirt to ensure there are no gaps and Biobarrier® is up to finished grade.



Refer to Guidelines (Pg. 1) & Vertical Instructions (Pg. 2)

Golf Greens/Bunkers

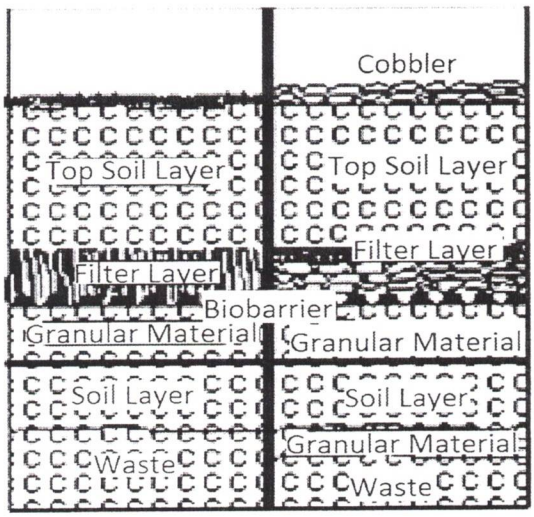


Dig a clean trench (extending to depth below existing roots) where Biobarrier® is to be installed. Remove roots on both sides of trench. Place top edge of Biobarrier® at finished grade level, securing with installation strips and/or pins provided, insuring that product hangs straight and taut, with no slumping or gaping. Backfill, compacting soil firmly. Biobarrier® may need to go deeper under these ideal growing conditions.

Refer to Guidelines (Pg. 1) & Vertical Instructions (Pg. 2)

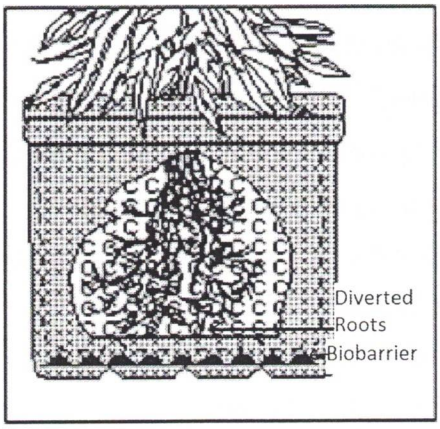
Landfills

This application usually requires seaming or overlapping and/or hold down pins (see Seaming Instructions, page 4). If seaming is not feasible, then edges of fabric must be overlapped at least 3 inches (or 2 nodules) and secured with pins in order to assure a continuous root control plane after cover is applied. There can be no gaps as the effective zone for stopping roots is 1 inch from the nodules. In new construction, it is advantageous to substitute Biobarrier® Root Control in place of most drainage fabrics since the geotextile in Biobarrier® is a standard AASHTO drainage fabric.



Refer to Guidelines (Pg. 1) & Vertical Instructions (Pg. 2)

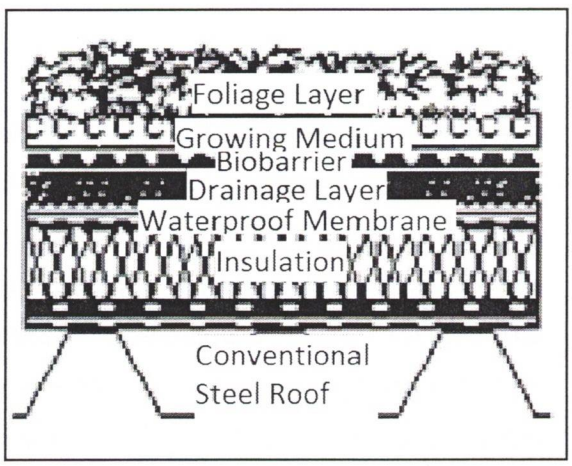
Pot 'n Pot



Place the socket pot of the two-pot system designed to make an airtight seal, in the ground. Cover the bottom of the socket pot with Biobarrier®; normally a 32 nodule pad or two 32 nodule pads for ~15 gallon containers, in the bottom of the socket pot. Do not add other material that might obstruct the seal in the bottom of the pot. Place the grower tub pot inside the socket pot, turning the drain holes 90°□to misalign holes. After the grower tub pots have been removed, collect the Biobarrier® patches and store in the plastic protective pouch until next season for a maximum life expectancy of 10 years.

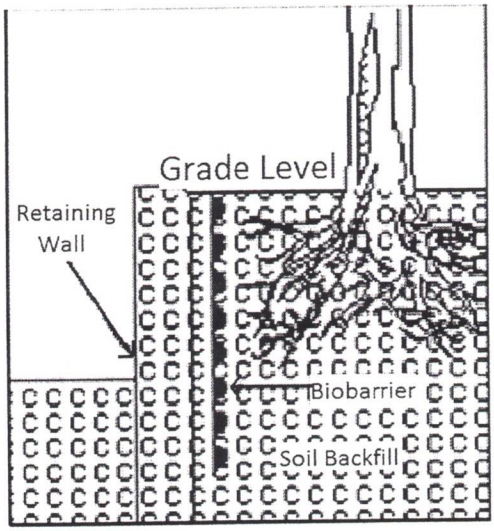
Refer to Guidelines, Page 1

Planting Beds/Pots/Roof Gardens



Biobarrier® can be used to line containerized beds to prevent roots from growing into them, clogging the drain systems or breaking planter walls. Biobarrier® should completely cover the drainage medium (plus at least 1 inch up all sides) in the bottom of the planting bed, then adequate soil, potting mix, mulch, etc. should be added to sustain desired plant growth. Growth will not be inhibited until roots enter the Biobarrier® zone, approximately 1" above fabric. Careful selection of plant material is needed in this application. Biobarrier® is used in planting pots to prevent roots from growing through drain holes. The bottom of the pot should be covered with drainage medium then the medium completely covered with Biobarrier®, permitting water to pass, but stopping roots. Biobarrier® can be used as the drainage fabric between the growing medium and the drainage medium in almost any application to prevent root intrusion into the drainage system. Roof gardens require site-specific custom designs; however, the above sketch is typical.

Refer to Guidelines, Page 1



Retaining Walls

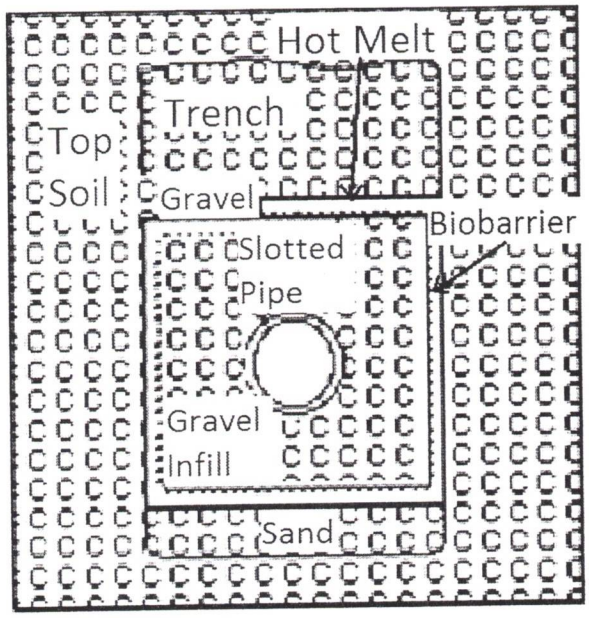
Dig a trench 1" deeper than chosen material width where Biobarrier® is to be installed. Prune and remove the roots of existing trees. Place Biobarrier® in the trench at finished grade level, securing with installation strips and/or pins provided. Backfill the trench, compacting the dirt to ensure there are no gaps.

If possible, trench should be cut at least 2 inches from retaining wall to allow for future root swell.

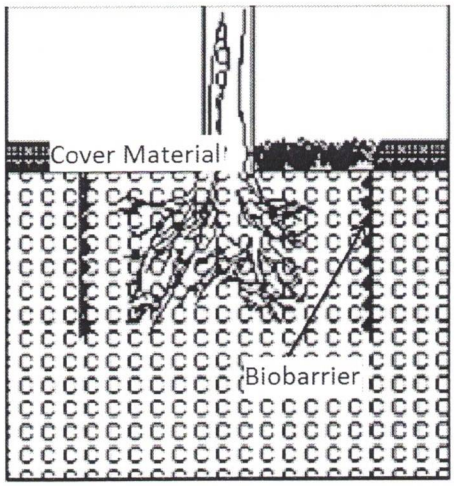
Refer to Guidelines (Pg. 1) & Vertical Instructions (Pg. 2)

Trench Drains & Septic Tanks

Completely surround the trench or tank and stone with Biobarrier® and/or overlap seam. The geotextile drainage fabric also serves to maintain the separation between the soil and the stone. Cut-outs for inflow and outflow pipe penetrations should fit snuggly around pipes. Wrap each pipe cut-out and junction with Biobarrier®, then secure with industrial tape or ties. Leave no gaps in the Biobarrier®.



Refer to Guidelines, Page 1



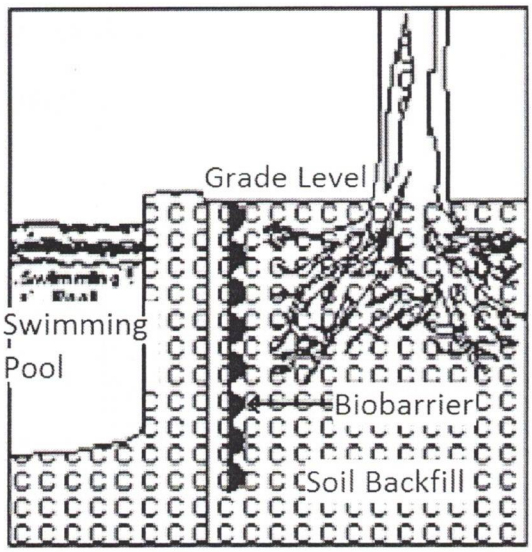
Sidewalks/Paths/Streets/Curbs/Medians/Tennis Courts

Dig a trench adjacent to hardscape (as close as possible) insuring depth is below where existing roots are found. After trenching, remove remaining roots, leaving walls of trench smooth. Place top edge of Biobarrier® at finished grade level, securing with installation strips and/or pins provided. Backfill carefully to avoid dislocating Biobarrier®, and compact firmly.

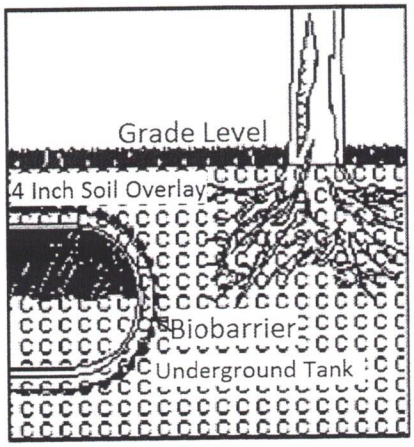
Refer to Guidelines (Pg. 1) & Vertical Instructions (Pg. 2)

Swimming Pools

Dig a trench adjacent to hardscape, pruning and removing any existing roots, leaving trench clean. Place Biobarrier® at finished grade level, securing with installation strips and/or pins provided. Backfill the trench, compacting the dirt firmly to ensure there are no gaps.



Refer to Guidelines (Pg. 1) & Vertical Instructions (Pg. 2)

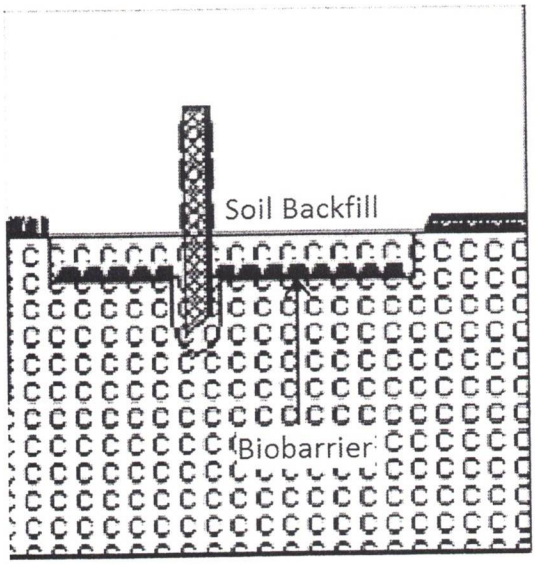


Site-specific design is required.

Underground Tanks, Vaults

Underground tanks may be protected from root intrusion by placing Biobarrier® across the top and securing to the sides of the tank before backfilling. Biobarrier® may also be placed on the sides and/or bottom of the tank. If a drainage system is provided around the tank, Biobarrier® may be used as the drainage fabric as well as to prevent root intrusion.

Refer to Guidelines, Page 1



Horizontal Weed Control Installation Instructions For:

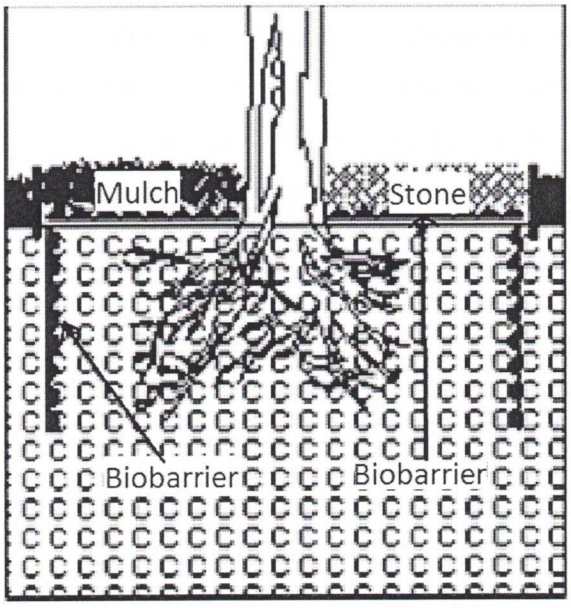
- **Guardrails & Fence Rows**
- **Street Medians, Landscaping, Tombstones**
- **Tree Skirts**
- **Utility Substations**
- **Pavers**

Guardrails and Fence Rows

Determine width of weed inhibition desired. Remove existing soil or plant material to a depth of 2 inches below grade. A one-time application of a systemic herbicide will help control growth until Biobarrier® herbicide zone is completely established (~ two weeks). Cut Biobarrier® lengthwise and fit by cutting 'x' shaped slits around rails or posts. Fabric must fit snuggly around rail or post to prevent weeds from growing up between it and the Biobarrier®. Secure Biobarrier® with pins (provided), and then add 2 inches of cover material. Rock or mulch are the preferred choices, however, soil, cinders or recycled shredded or chipped rubber may be used. In new installations, place Biobarrier® in width desired, place cover material, and install guardrail posts or fence posts through the fabric. Be sure to maintain the cover as UV and heat significantly reduce the life of Biobarrier®.

Refer to Guidelines, Page 1

Street Medians, Landscaping, Tombstones:
(Combination Application)



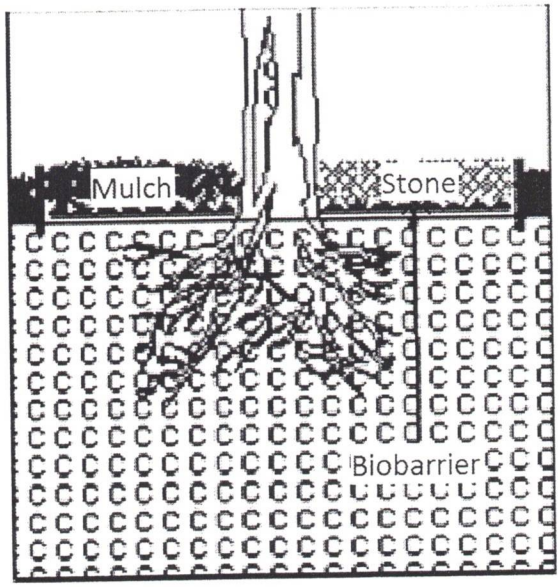
Since this application also utilizes Biobarrier® Root Control, see vertical installation instructions (page 2).

Remove unwanted vegetation and material to a depth of 2 inches below grade. A one-time application of a systemic herbicide will help contain growth until the ® herbicide zone is completely established (~ two weeks). Position and cut fabric for existing or new plants. Cut 'x' for plants with scissors or knife. Fit fabric around plant, folding flaps up close to each plant. Secure fabric edges by cutting a shallow trench (>1 inch) and 'toeing in' exposed edge of Biobarrier®. Pin fabric edge in trench at least every 4 ft. Add width, if required, by overlapping fabric 3 inches (75mm) and pinning in place. Add 2 inches (50 mm) of cover material. Plant roots will not grow in 1 to 2 inch zone next to Biobarrier®, so plants should be selected considering their normal root depth. The 2 inches of cover material must be maintained for long-term effectiveness.

Refer To Landscaping Installation Instructions (Page 16)

Tree Skirts

Determine size of area where surface vegetation is to be controlled. Cut a narrow trench with the edge of a shovel in desired shape. With scissors or knife, cut Biobarrier® on line indicated, through the center point, extending slits as necessary to permit fabric to fit snugly around tree trunk. Fold 'points' of fabric under. Bring cut skirt edges together, securing with landscape pins (provided in package). "Toe-in" or press outside edges of Biobarrier® down into trench. Insert landscape pins at 1' intervals around perimeter of skirt.

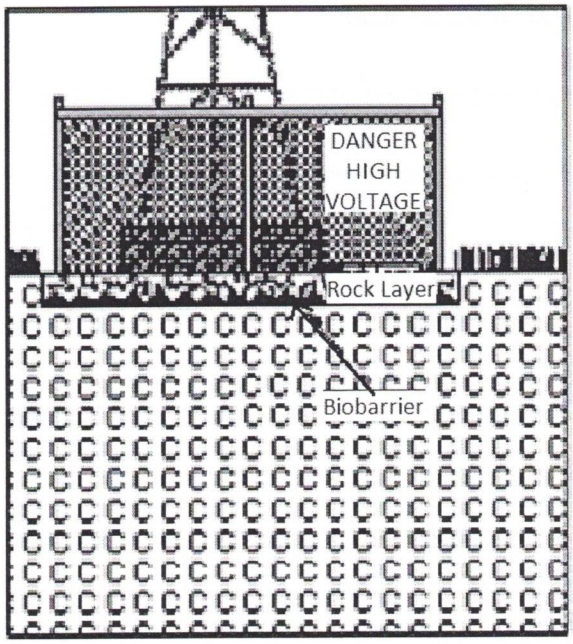


A rigid retainer around the tree can keep cover material in place and aid in keeping the edges of the Biobarrier® material in the narrow 'toe-in' trench. With tip of shovel, make 1"-2" cuts in soil slightly back from edge of Biobarrier®, then tuck fabric edge in. Pins should then be placed every foot around edge of skirt to prevent it being pulled up by mowing equipment.

Cover Biobarrier® tree skirt with 2" of stone, mulch or soil. This depth must be maintained for optimum effectiveness. Deeper cover will permit more root growth for a longer period. However, if a seed does germinate, even in the 2" layer, when it attempts to grow down to set up a viable root system, it will come in contact with the herbicide zone and cease growing. Exposure of Biobarrier® to sunlight will result in less than guaranteed life. Keep it covered.

Refer To Landscaping Installation Instructions (Page 16)

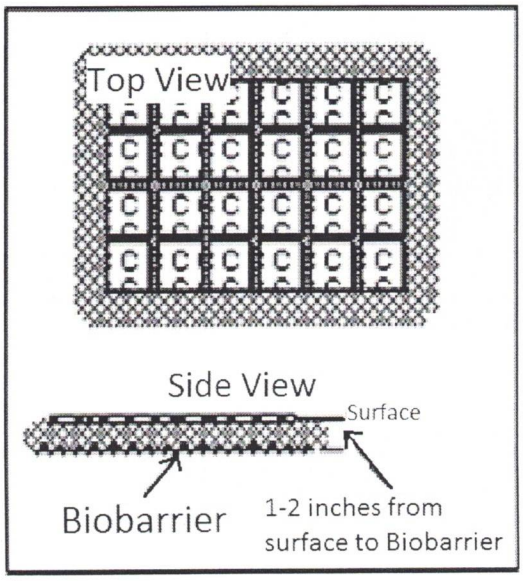
Utility Substations



Remove existing soil or plant material to a depth of 2 inches below grade. A one-time application of a systemic herbicide will help contain growth until Biobarrier® herbicide zone is completely established
(~ two weeks).

Place Biobarrier®, overlapping or seaming according to seaming instructions (page 4) until desired width is achieved. Extend Biobarrier® 18 inches beyond fence line for maximum benefit. Place 2 inches of cover material on the fabric. The objective is to prevent UV exposure and heat from degrading the Biobarrier®. At least 2 inches of cover material must be maintained to obtain normal life expectancy.

Pavers



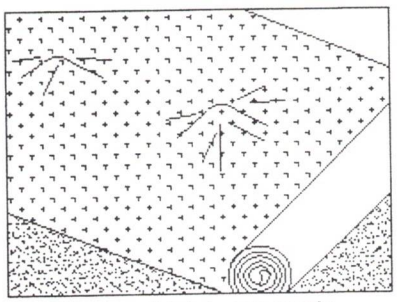
Excavate 2" below grade level, removing unwanted vegetation (especially that which could puncture fabric). Apply a systemic herbicide to prevent re-growth, if desired.

Place Biobarrier® horizontally, securing edges by "toeing in" to a shallow trench, then anchoring with landscape pegs (included). Layer 1" to 2" of sand on top of Biobarrier®, position pavers in desired pattern and level.

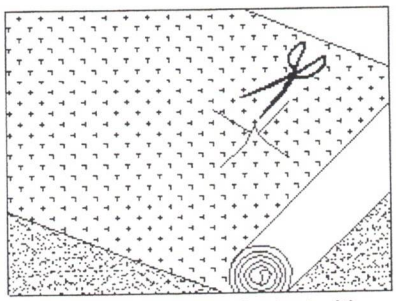
Refer To Landscaping Installation Instructions (Page 16)

BIOBARRIER® WEED CONTROL INSTALLATION (Landscaping)

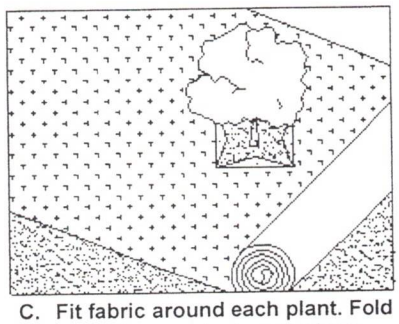
1. Remove unwanted vegetation (particularly green foliage) and materials that can puncture the fabric.
2. Wear chemical resistant gloves & eye protection; avoid contact with skin and clothing to prevent staining.
3. Open the sealed yellow barrier wrap. Install product and cover as soon as possible (within 12 hours). High temperatures and direct sunlight will reduce effective life. Place unused material in the barrier wrap and seal with ties provided.
4. Position and cut fabric for existing or new plants. Add width, if required, and secure in place with landscape pegs provided (see illustrations A through F):



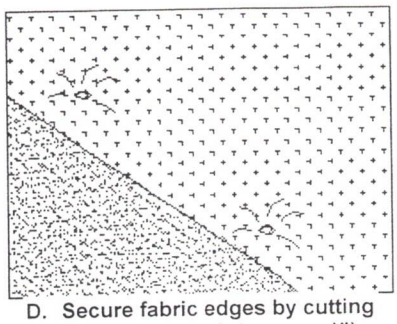
A. Simply roll fabric out gently over existing plants.



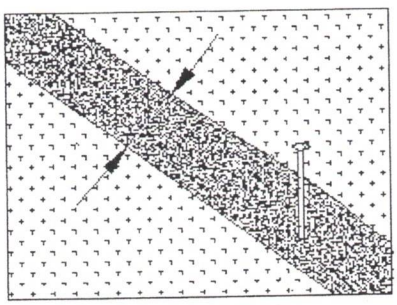
B. Cut "X" above each plant with household scissors or knife forming triangular flaps.



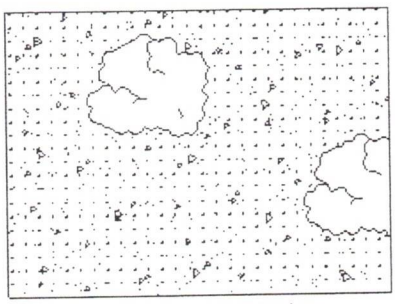
C. Fit fabric around each plant. Fold back flaps against each plant



D. Secure fabric edges by cutting a shallow trench (approx. 1") & 'toeing in' edge of Biobarrier into trench. Peg fabric edge in trench every 4'



E. Add width if required by overlapping fabric three inches (75 mm) and staking in place.



F. Cover fabric with 2 inches (50 mm) of material.

Ensure a two-inch (50 mm) cover material depth is maintained.
These guidelines treat a typical installation for surface vegetation control.
Minor procedural changes may be required depending on your specific application.