

Enkadrain®

EnkaRetain & Drain®

Enkamat®

Enkaroo VM®



Colbond Building Products

Green Roof / Roof Garden Products



The thin line between comfort and catastrophe™



Roof garden plants can be exotic and colorful.



Flowering plants add beauty to our habitat.



Green roofs big and small help the environment.

Enkadrain was the first drainage composite introduced into the marketplace over 25 years ago. Our European offices in the Netherlands and Germany have tested our products in extensive research studies at the University of Hanover, Germany. Based on this experience shared across the ocean, Colbond has developed relationships in North America with the fastest growing leaders in green roof technology and has been involved in some of the most innovative installations on the continent.



Green roofs are divided into two basic types - *intensive* and *extensive*. An intensive green roof is what is typically called a "roof garden." They are traditionally more expensive because the soil medium depths are between 8" and several feet to make growing small trees and a wide variety of other plant species possible. The structure must be built to support heavier loads. Extensive green roofs have a thinner profile which makes them lighter and more economical. The soil medium depth is from 2" - 6". Plants used in this roof type typically require less maintenance.

Colbond Building Products has developed a family of products used for drainage and root reinforcement in multi-layer green roof configurations:



EnkaRetain & Drain 3111 is the newest green roof product offered by Colbond.

This all-in-one drainage / water retention layer combines Enkadrain 3611R with a super absorbent water retention fabric that holds 10 times its weight in water. The fabric absorbs water for continuous hydration of plant roots, while excess water passes through to the drainage core below.

Benefits of Green Roofs & Roof Gardens

- **Energy Efficient**
Green roofs reduce building cooling costs by controlling or reducing heat gain.
- **Reduces Urban Heat Island Effect**
Dark roofs magnify the force of heat by holding onto it or reflecting it back into the urban zone making city life unbearable in summer months. Green roofs absorb the heat without magnifying it which directly contributes to environmental heat control.
- **Improves Microclimate**
Reduces dust and smog in the air we breathe and produces oxygen we need to live.
- **Stormwater Reduction**
Green roofs mitigate stormwater runoff saving city drainage systems from overload during peak flows. For municipalities there is a decreased need to expand or rebuild stormwater infrastructure.
- **Aesthetics**
Green roofs are visually appealing and allow people to make use of garden areas for recreation and pleasure.

Enkadrain 3811R is a drainage product consisting of a post-industrial recycled polypropylene core of fused, entangled filaments and nonwoven fabric bonded to two sides. The tangled filaments are molded into an elliptical pattern for maximum strength and continuous flow under any load. Smooth, tough Colback® fabric protects the waterproofing membrane and eliminates the need for a protection board.

Enkadrain 3611R has the same medium-duty core as Enkadrain 3811R, while **Enkadrain 3615R** has a heavy-duty core with higher flow rates. Both have a nonwoven fabric bonded to one side and are used when extra protection for the waterproofing membrane is not needed.



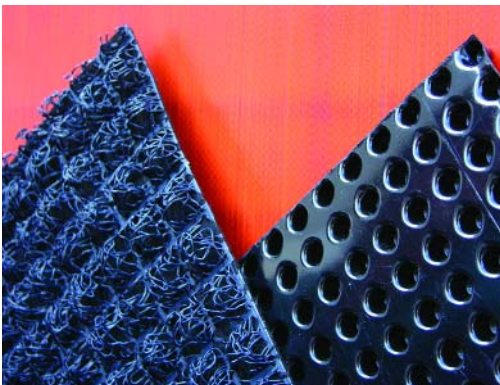
Enkamat 7010 - Root Reinforcement

Matrix permanently anchors plant roots on sloped roofs or in high wind conditions. The 95% open structure of Enkamat is designed to ensure that any type of vegetative growth is not restricted when interacting with the mat. As the roots grow they become entwined within the Enkamat, making an extremely stable cover. Its tough root reinforcing system anchors vegetation and provides a holding cavity for the growing medium.



Plants are grown directly in Enkaroo VM and transported to the site ready to unroll.**

Enkaroo VM is an Enkamat core with a non-woven fabric attached to the bottom side designed for pre-vegetated mat applications. The mat is filled with the growing medium and plants are grown directly in the mat structure. After the plant roots are established and entwined within the Enkamat, the mat is ready for transport. The fabric holds soil medium and vegetation in place while the flexible matting is rerolled and shipped to the installation location. This unique application has been highly successful in Europe.



There are significant benefits of using Enkadrain vs. rigid cusped drains in green roof gardens:

- **Enkadrain lays flat** — which is critical in horizontal drainage applications
- **Enkadrain is flexible** — will conform to any surface profile

- **Enkadrain is safer to work with** — no sharp edges and corners
- **Enkadrain is 95% open** — multi-directional flow does not trap water behind hard, plastic sheet
- **Enkadrain contributes to LEED points** — made from recycled polypropylene
- **Enkadrain is easy to seam** — fabric flaps to the outside for faster installation

Why use Enkadrain instead of mineral drainage layers?

- Enkadrain provides an air layer for better insulation and allows the roots to breathe
- Enkadrain provides multi-directional flow and has proven and predictable flow rates
- Enkadrain has a nonwoven filter fabric attached which helps protect waterproofing membrane from overload and rock penetration
- No aggregate is needed with Enkadrain which reduces the total roof weight



Enkadrain is manufactured by a process that eliminates roll memory, causing it to lay completely flat unlike other products.



Enkadrain is safer for installers to handle than sharp, hard plastic.



Project Name	Location	Enka Products	Size
Epworth Manor Nursing Home	Tyrone, PA	Enkadrain 9010 Enkamat 7010	3,000 sq. ft.
Aquascapes Design	Batavia, IL	Enkadrain 3611R	122,000 sq. ft.
Village Mall	Queens, NY	Enkadrain 9811	56,000 sq. ft.
Union Square	San Francisco, CA	Enkadrain 9812	29,000 sq. ft.
Lyman Woods	Chicago, IL	Enkadrain 9615 Enkamat 7010	2,000 sq. ft.
Wallace Properties	Vermont	Enkadrain 9615 Enkamat 7010	4,000 sq. ft.
Millennium Park	Chicago, IL	Enkadrain 9615	320,000 sq. ft.
Chicago City Hall	Chicago, IL	Enkamat 7004	25,000 sq. ft.
University of NC Dormitory	Greensboro, NC	Enkadrain 3811R	13,000 sq. ft.
NJ Statehouse	Trenton, NJ	Enkadrain 9812 Enkadrain 9615	175,000 sq. ft.
251 Medical Center Blvd.	Webster, TX	EnkaRetain&Drain	16,000 sq. ft.

Note: 3000R Series drains can be used in place of 9000 Series drains.



Union Square in San Francisco, CA is home to the first subterranean parking garage in the United States.



Preparation for the Enkadrain layer at the New Jersey State House roof garden project.



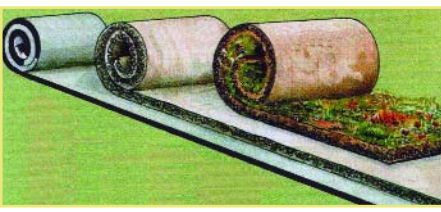
16,000 sq. ft. of EnkaRetain & Drain is being installed on the 251 Medical Center Blvd. project. Photo courtesy of Jacob White Construction.

We Have Proven Results

From revolutionary one-step below ground drainage and waterproofing systems to roll out sound attenuation matting for residential and commercial buildings, our products are well-known for quality and proven performance. State of the art R&D and production facilities give us the ability to adapt our products to meet the challenges of the constantly changing construction market.



Incorporated into the roof garden are granite paved walkways, fountains, and trees.



Installation of the rolled Colbond products is easy and fast.



- Cover Photo Key**
- 1** Chicago City Hall - Chicago, IL
 - 2** Millennium Park - Chicago, IL

* Photos courtesy of The Garland Company, Inc.
 ** Photo courtesy of Emery Knoll Farms

Colbond Inc.

Colbond is a leading producer of high-quality synthetic nonwovens for flooring, automotive, and construction applications, and three-dimensional polymeric mats and composites for civil engineering, building, and industrial applications.

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