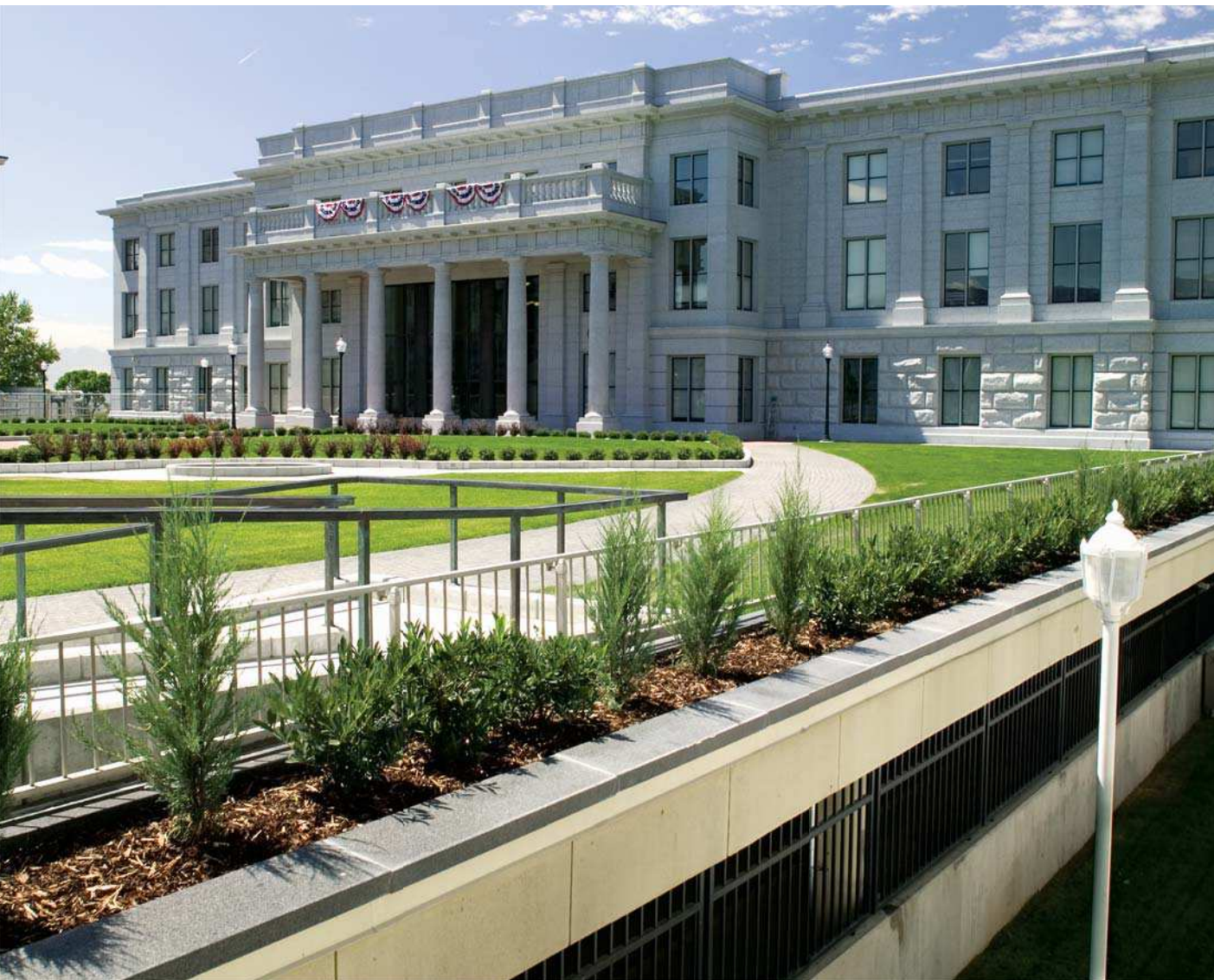


SCIENCE. SERVICE. SOLUTIONS.



# ROOF GARDEN

Green Roof Products, Designs and Solutions





# ROOF GARDEN

## Green Roof Products, Designs and Solutions

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Now you have the freedom to design an aesthetically pleasing landscaped roof with the security of the best waterproofing in the business. Carlisle Coatings & Waterproofing, Incorporated (CCW) the known leader in above- and below-grade waterproofing, offers multiple solutions for waterproofing and designing green roof systems. Specifying a system that provides the environmental benefits of clean air, reduced water run-off and energy conservation, with the dependability of CCW's waterproofing technology, is what architects, specifiers and building owners are demanding from green roof systems.

Established in Europe, green roofs are known to be both functional and aesthetically appealing, when the correct system design and products are applied. These roofs offer sustainability and energy efficiency while adding plant life in populated areas. Green roofs meet the objectives of many of the mandates to improve the air quality of cities by mitigating the effects of urban heat island caused by ever-increasing development. The benefits of the modern green roof have been seen with the U.S. Green Building Council's endorsement of these systems through the LEED® (Leadership in Energy Efficient Design) Green Building Rating System®.





## A Complete System

The waterproofing protection is a single-component membrane, either rolled or laid, that forms a tough flexible membrane, which adheres tenaciously to concrete substrates. This low-maintenance system also provides ecological benefits, contributing to municipal goals of decreasing heat islands and reducing run-off while increasing green spaces.

CCW provides a broad range of solutions to meet specific waterproofing needs. CCW offers technical services, research and development and manufacturing capabilities from its headquarters in Wylie, Texas and two additional manufacturing facilities in Terrell, TX and Carlisle, PA. The CCW network is further supported by over 50 manufacturer's sales representatives directed by regional sales offices throughout the country. CCW offers a complete line of waterproofing and moisture protection products for the architectural, general construction, industrial and maintenance industries. Carlisle Coatings & Waterproofing, Incorporated, is part of the Carlisle Construction Materials division of Carlisle Companies, Inc., which is a publicly traded company on the NYSE.

## Planting Solutions For Every Application

Carlisle Coatings & Waterproofing realizes each green roof is unique. CCW is teamed with RoofScapes and Hydropack to create a completely warranted CCW Green Roof that meets each building's needs. CCW also works with landscape designers to create custom green roof systems.

CCW provides the following information to assist customers in evaluation of expected weight loads of our waterproofing systems in CCW Green Roof applications.

The weights are lab test reported in square foot increments with:

- Dry (defined as absence of water)
- Saturated (exposed to water until excess water flows away)
- Flood Weight (drain failure condition to assess weight of system in a capacity mode)

Important Note: Soil weights are not available as soils are not standardized. Carlisle advises potential soils be weighed dry and saturated prior to weight designs.

## Features & Benefits

- Increase building value
- Add recreational square footage to building
- Reduce rooftop temperatures
- Reduce urban heat island
- Manage stormwater by retaining rainfall
- Improve city & building energy efficiency
- Maintain natural processes by reducing airborne pollution and generating oxygen



Above: CCW-500R Waterproofing System is one of the essential components available for CCW Green Roofs.

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### Product Weights

Product	Dry Weight SF	Saturated Weight SF	Flood Weight SF	Water Retention SF
Solids Content	563 g / 1.24 lb *	*	*	minimal
CCW-Protection Course-V	26 g / 0.06 lb	(51 g)		25 g or 1 oz
CCW-Protection Course-H	287 g / 0.63 lb *	(333 g) *	*	46 g / 0.1 lb or 1.6 oz *
CCW-Protection Course-HS	259 g / 0.57 lb	(280 g)		21 g or 1 oz
Root Barrier	45 g / 0.1 lb *	*	*	minimal
MiraDRAIN® GR9400	123 g / .27 lb	(739 g) / 1.63 lbs		
CCW 300 HV	46 g / 0.1 *	(360 g) / 0.80 lb*	*	314 g/0.69 lb or 11 liquid oz
CCW 200V	28 g / 0.06 lb	(190 g) / 0.42 lb		162 g/0.36 lb or 5.5 liquid oz
<b>System Weights</b>	<b>1,336 g / 2.95 lb</b>	<b>2,178 g / 4.80 lb</b>	<b>3,238 g / 7.13 lb</b>	<b>842g/1.85 lb or 29 liquid oz</b>

\* Components used in each column that make up the total "System Weights" listed

\*\* The discrepancy in the saturated assembly weight and the components is due to water entrapped between the layers within the assembly.

### CCW Green Roof Without Insulation

- 1 Concrete Substrate
- 2 CCW Contact Adhesive
- 3 90 mils of CCW-500
- 4 CCW Reinforcing Fabric
- 5 125 mils of CCW-500
- 6 CCW-Protection Board HS
- 7 Root Barrier
- 8 CCW MiraDRAIN GR9400
- 9 Six Inches or Less of Soil







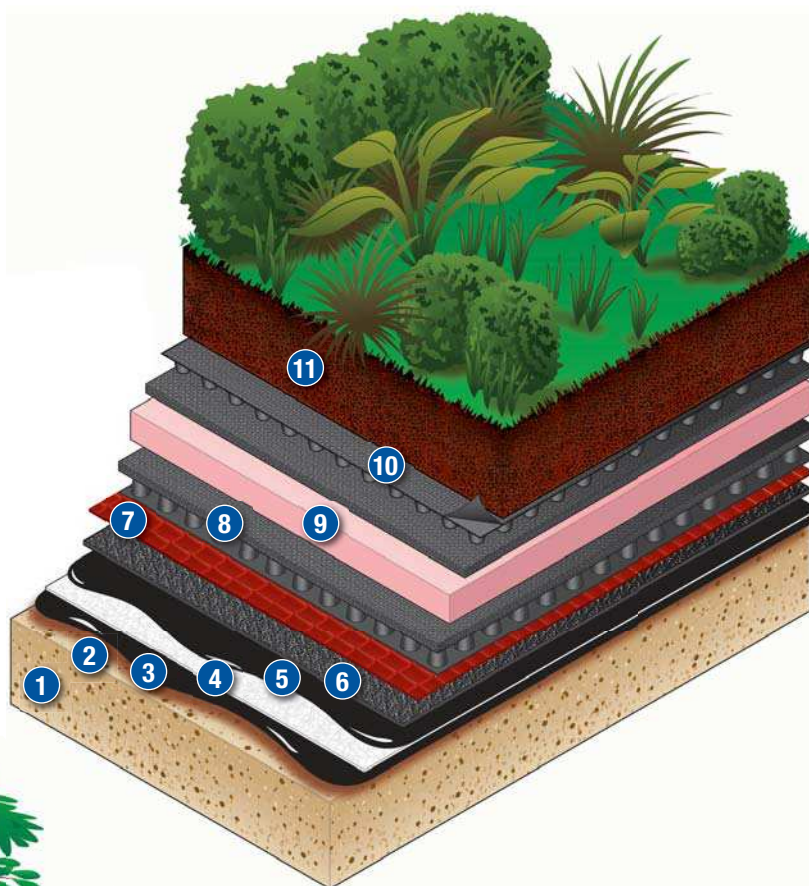


# ROOF GARDEN

## Green Roof Products, Designs and Solutions

### CCW Green Roof With Insulation

- 1 Concrete Substrate
- 2 CCW Contact Adhesive
- 3 90 mils of CCW-500
- 4 CCW Reinforcing Fabric
- 5 125 mils of CCW-500
- 6 CCW-Protection Board HS
- 7 Root Barrier
- 8 CCW MiraDRAIN 9900
- 9 Insulation as required
- 10 CCW MiraDRAIN GR9400
- 11 6" to 10" of soil



### CCW Planters

- 1 Concrete Substrate
- 2 CCW Contact Adhesive
- 3 90 mils of CCW-500
- 4 CCW Reinforcing Fabric
- 5 125 mils of CCW-500
- 6 CCW-Protection Board HS
- 7 Root Barrier
- 8 CCW MiraDRAIN 9800
- 9 10" or more of soil



Species	Mature Height (in)	Flower Color	Months in Bloom
Allium schoenoprasum 'Forescate'	18–24	Pink	May
Sedum acre	12–18	Yellow	June
Sedum album	12–18	White	JJ
Sedum album 'Coral Carpet'	12–18	White	JJ
Sedum 'Bailey's Gold'	12–18	Yellow	JJA
Sedum cauticola 'Lidakense'	6–8	Pink	AS
Sedum hybridum 'Immergrunnen'	18–24	Yellow	JJ
Sedum kamtschaticum	12–18	Yellow	MJJA
Sedum reflexum	12–18	Yellow	July
Sedum rupestre 'Forsteranum'	12–18	Yellow	JJ
Sedum sexangulare	6–8	Yellow	JJ
Sedum spurium 'Dragon's Blood'	12–18	Rose Red	JJ
Sedum spurium 'Fuldaglut'	12–18	Ruby Red	JJ
Sedum ternatum	12–18	White	May
Sedum X 'Vera Jameson'	12–18	Magenta	August
Sempervivum tectorum	3–6	Red	July
Sempervivum tomentosum	3–6	Pink	July

Note: All standard orders contain a variety of five pre-selected sedum species. Custom plant selection is available upon request and subject to additional charges.

\* Consult a structural engineer to determine load capabilities of the building prior to installation.





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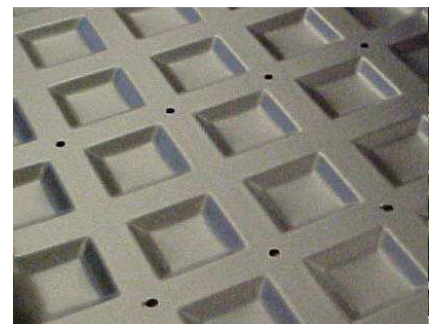
## Green Roof Products, Designs and Solutions

### CCW GreenGrid System

The Carlisle Coatings & Waterproofing GreenGrid® System offers distinct advantages over more complex systems with its simplicity in design, pre-planted modules and movable modular features.

#### Features & Benefits

- Single-source responsibility. Roofing/Waterproofing contractors can install both the waterproofing and the Green Roof System in one installation
- No planting on the roof. Trays are pre-planted before arriving at the jobsite, including the root barrier, soil media and plants
- The trays can be easily removed for a roof repair
- Building owners obtain single-source warranty coverage
- Easy to handle and fast to install
- Tray is a cost-competitive alternative
- Standard GreenGrid System Includes:
  - Tray depth: 4"
  - 4" tray - weighs 15 psf (fully saturated with water)
  - Tray sizes: 2' x 4', 2' x 2' (fill product), 40" x 40" (larger designs)
  - Plantings: Sedum 10" O.C.
- Custom GreenGrid System Options:
  - Tray depth: 8"
  - 8" tray - weighs 28 psf (fully saturated with water)
  - Tray sizes: 2' x 4'
  - Two more plants per tray for quicker fill
  - Plantings: Sedum, other plants and special patterns



### CCW GreenGrid Assembly

- |                          |                              |
|--------------------------|------------------------------|
| 1 Concrete Substrate     | 5 125 mils of CCW-500        |
| 2 CCW Contact Adhesive   | 6 CCW-Protection Board HS    |
| 3 90 mils of CCW-500     | 7 CCW MiraDRAIN              |
| 4 CCW Reinforcing Fabric | 8 GreenGrid with four inches |





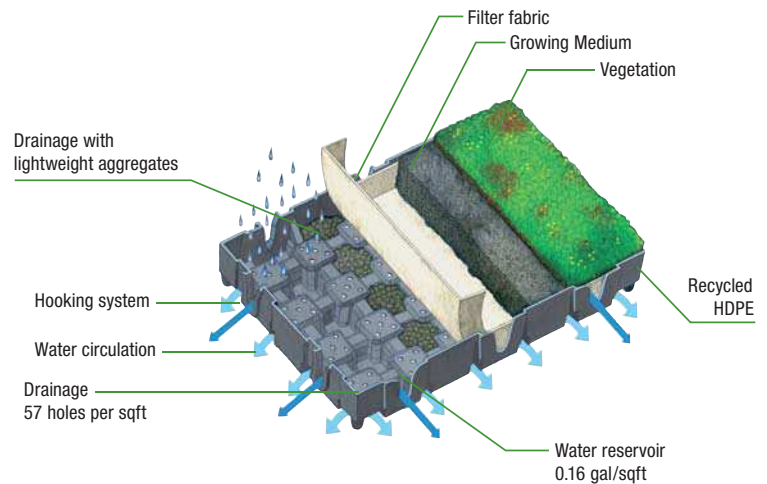
## Hydropack System

CCW Hydropack Green Roof system offers distinct advantages over more complex systems with its simplicity in design, pre-vegetated modules and removable modular features. Hydropack uses a dedicated aggregate drainage layer, filter fabric and FLL-compliant growth media. Hydropack modules lock together and allow sharing of moisture and nutrients, but do not permit the roots to grow from tray to tray, allowing for ease of removal.



### Features & Benefits

- No planting on the roof – modules are pre-vegetated prior to arriving on jobsite
- Lightweight, easy to handle and fast to install
- Single-source responsibility - contractors can install both the waterproofing and Green Roof in one installation
- Modules are easily moved for modifications or repair
- Single-source warranty coverage
- Only 17.5 pounds per square foot fully saturated, making it one of the lightest Green Roof modules on the market
- Protects roofing membranes from UV radiation and extreme weather conditions
- Reduces noise infiltration through the roof by up to 40 dB
- Helps to manage stormwater runoff



Designed & produced by:

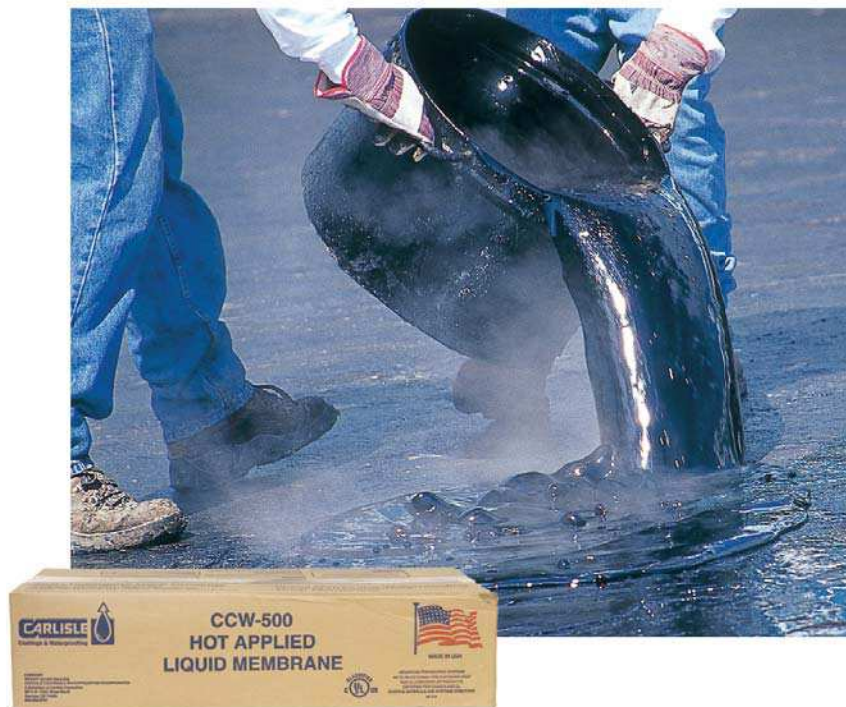




# ROOF GARDEN

## Green Roof Products, Designs and Solutions

### Waterproofing – Hot-Applied



#### CCW-500 Hot-Applied

CCW-500 reinforced, hot-applied, liquid membrane system prevents water migration on both vertical and horizontal surfaces. This seamless, monolithic system offers full adhesion to most substrates. CCW-500 is an excellent waterproofing solution for green roof planting systems, plaza decks, roof terraces and planters.

### Waterproofing – Hot-Applied



#### MiraSEAL

MiraSEAL is available in a single viscosity for both horizontal and vertical surfaces. Its moisture-tolerant, polyether properties cure to form a strong, flexible membrane for both above- and below-grade applications. MiraSEAL's patented, odor-free formula cures three times faster on green concrete than other cold-applied systems and requires no primer. With MiraSEAL, your next waterproofing job is complete five days before the concrete is cured when using traditional cold-applied systems.



## Protection Board



### CCW Protection Boards

CCW Protection Boards are tough membranes that provide positive protection to the waterproofing membrane during installation of other work. CCW Protection Board H and HS are designed for installation horizontally in the CCW-500R System. CCW Protection Board V is designed as a vertical protection course on waterproofing membranes.

## Root Barrier

### Root Barrier Membrane

CCW's Root Barrier membrane is a high-strength, specially formulated membrane designed for the CCW Green Roof and CCW-500R Waterproofing Systems. It does not contain plasticizers that can migrate to the surface and attack some asphalt-based materials. Root-Barrier is a 16-mil (0.41 mm) membrane made from a layer of tightly woven HDPE scrim with a continuous two-mil (.05 mm) polymeric coating on both sides.

## Water Retention – Moisture Mat



### CCW 300HV

CCW 300HV is a 16-ounce per square yard, needle-punched polypropylene fabric which aids in the water-retaining volume of green roof systems. Nonbiodegradable, resistant to mildew, insects and common soil chemicals, CCW 300HV is installed between the Root Barrier and CCW MiraDRAIN drainage composite where it benefits plant growth without disturbing the waterproofing layers below.

## Water Retention – Drainage



### CCW MiraDRAIN GR9400 & HC

CCW MiraDRAIN GR9400 is designed specifically for green roofs and large planter applications. CCW MiraDRAIN HC provides a deeper reservoir for added water retention. Used with CCW waterproofing, these drainage composites provide adequate water retention for sedums, grasses and plant life, while providing a channel for excess water to drain.

## Engineered Soils



### Carlisle Engineered Growth Media

A lightweight FLL-approved growth media used for roof garden applications. Applied at the specified depth on Carlisle Roof Garden assemblies.



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## Limited Warranty

Carlisle Coatings & Waterproofing, Incorporated (Carlisle) warrants this product to be free of defects in workmanship and materials only at the time of shipment from our factory. If any Carlisle materials prove to contain manufacturing defects that substantially affect their performance, Carlisle will, at its option, replace the materials or refund its purchase price.

This limited warranty is the only warranty extended by Carlisle with respect to its materials. There are no other warranties including the implied warranties of merchantability and fitness for a particular purpose.

Carlisle specifically disclaims liability for any incidental, consequential or other damages including, but not limited to, loss of profits or damages to a structure or its contents arising under any theory of law whatsoever.

The dollar value of Carlisle's liability and buyer's remedy under this limited warranty shall not exceed the purchase price of the Carlisle material in question.

### Carlisle Coatings & Waterproofing

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