



FROM GREEN TO BLUE AND PURPLE ROOFS

A KALEIDOSCOPE OF NEW GARDEN ROOFS TAKE ROOT ON THE ROOFTOPS

BY MARY KREMPOSKY MCARDLE, ASSOCIATE EDITOR

Garden roofs - lovely, functional, and blooming with seasonal colors - have been sprouting on a growing number of rooftops for the last several decades. Today, rooftops are blooming with new versions of these high-rise gardens. Dubbed blue roofs and purple roofs, each of these "roofs of a different color" can work with existing green roof systems to amplify the stormwater management benefits of a rooftop garden.

American Hydrotech, Inc. and R.M. Hunter Co. have been working together for 48 years in the roofing industry. Headquartered in Chicago, Hydrotech is North America's leading pioneer and innovator in green roof technology and a recognized leader in the development, production, and distribution of premium waterproofing and roofing products. For over 60 years, R.M. Hunter Co., Grosse Ile, has been representing manufacturers of quality construction materials, including plaza waterproofing and green roof systems, along with concrete and masonry

repair products, expansion joints, non-slip urethane and epoxy coatings, expansion joints, and other products. Hydrotech has been providing buildings across the United States - and R.M. Hunter has been serving Michigan and the Midwest - with impeccably engineered garden roof assemblies installed by Hydrotech-certified installers. Today, both companies are at the forefront of not only green roofs but innovative new sustainable roofing technologies.

Taking the Blue Roof Plunge

Blue roofs take stormwater management to the next level; this roofing type actually detains stormwater in a rooftop enclosure. "A blue roof is basically rooftop detention, utilizing some sort of void space on the roof," said Kevin Serena, Hydrotech, Central Region Technical Sales. "The goal is to detain water for 24 to 48 hours and let it slowly drain off the roof over time by restricting the water outflow utilizing a control flow drain. This cuts down on peak stormwater flow, so all

the water from a given storm doesn't reach the sewer system at the same time."

In some cases, the void space for stormwater detention is placed underneath pedestal pavers. In other cases, the detention enclosure is placed underneath the plants and growing media. The Belt Line Center in Detroit has taken the blue roof plunge with a portion of the rooftop dedicated to this new system. Located on the site of Detroit's future Beltline Greenway, the Center is a rehabilitation of a vintage Albert Kahn-designed building repurposed as a mixed-use facility.

The Belt Line Center has a 17,250-square-foot extensive green roof and a 2,000-square-foot gravel ballasted blue roof, according to the website of Inhabitect, the construction manager and installer of both Hydrotech systems supplied by R.M. Hunter. "The project received both Property Assessed Clean Energy (PACE) financing and a grant from the City of Detroit based on the stormwater performance of that roof,"

LEFT: Rooftop gardens skirt the upper levels of the Munson Medical Cancer Center in Traverse City. Photo courtesy of Inhabitect

Serena said. (PACE is a long-term financing tool for commercial property owners to pay for energy efficiency, water efficiency, and renewable energy upgrades.)

This PACE financing was a first for a sustainable roofing system. According to Inhabitect's website, "In 2020, Inhabitect completed Michigan's first PACE-funded green roof project. (Belt Line Center) was the first of its kind in the state, and the first green stormwater infrastructure project that was solely funded by PACE in the United States."

Blue roofs have made strong inroads in Europe, and as shown by Belt Line Center, are beginning to appear in cities across the United States. "New York City was the first city in the United States to have a blue roof," Serena said. "Hydrotech first started diving into combination blue/green roofs around seven years ago. We've now done four or five, including two in Chicago, and one each in Madison, Wisconsin, New York City, and Philadelphia. A few others are now in design in Michigan. A potential blue roof project is a raised platform system for a rooftop plaza on a building along the Detroit River."

Hydrotech's strong technical expertise in both roofing and sustainable roofing solutions counteracts any misgivings about having a stormwater enclosure on the roof. Every roofing system in Hydrotech's diverse family of sustainable roofs begins with its Monolithic Membrane 6125® (MM 6125) waterproofing/roofing membrane.

According to Hydrotech literature, "the MM 6125 is a hot, fluid-applied rubberized asphalt containing 40 percent recycled post-consumer content. The seamless membrane has been used in fountains, plazas, rooftops, reflecting ponds, planters, tunnels, and other applications where contact with water is to be expected. ...The MM 6125 has a track record of over 60 years of proven performance worldwide." In addition to vegetated roofs, according to R.M. Hunter President James (Jim) C. Hunter, the two companies even used the ever-durable MM 1625 to waterproof the tunnels beneath the Michigan State Capitol and the roof of the adjacent Heritage Center Museum in Lansing.

Purple Roofs

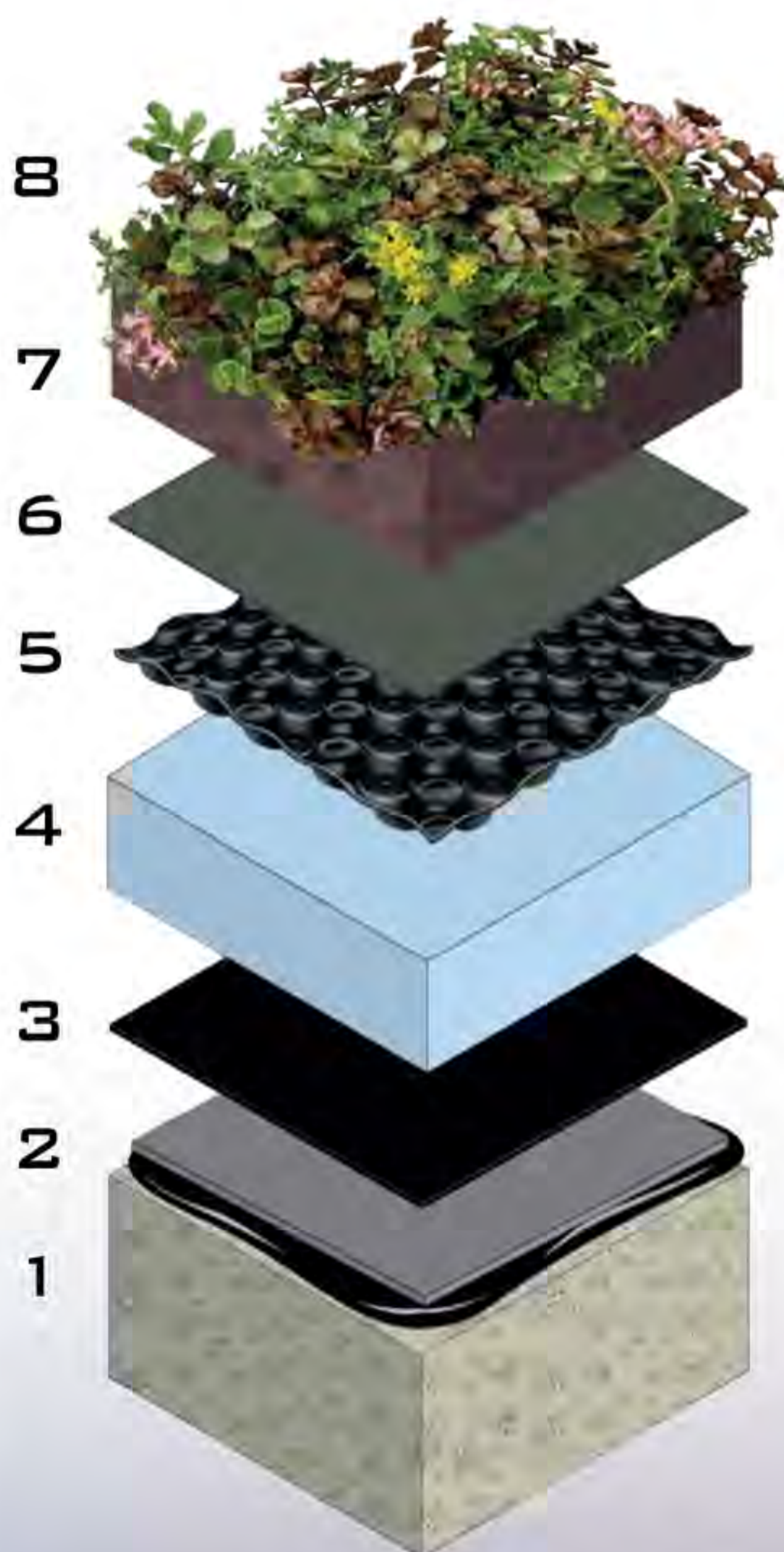
Hydrotech recently finished the first single-source purple roof in the United States for the Hilton 2.0 Hotel in Columbus, Ohio. In Detroit, Hydrotech and R.M. Hunter are in early discussions with the design team for a section of purple roof on the same Detroit riverfront project now considering a blue roof area.

Serena explains the difference between a blue and a purple roof: "Essentially, a blue roof detains water on a dead-level roof; a purple roof can detain water on both dead-level and sloped roofs. ...Typically, a purple roof detains less water – an inch or two – as opposed to the three to five inches of a blue roof.

"On a purple roof, a fabric basically slows the movement of water down at a specified rate even on a slope," said Serena in explaining the workings of a purple roof. "The fabric has micro-fiber threads oriented in such a way that it creates friction when the water tries to flow through the fabric. That friction creates turbulence and restricts the flow of water at a measurable and controlled rate."

The purple roof can be installed in combination with a green roof system. "The stormwater percolates through the growing media of the green roof, and when it reaches the fabric layer, it can't flow horizontally," Serena said. "It backs up either into the growing media or into a honeycomb-like void system, depending on how much water the system is engineered to detain."

1. Structural roof deck
2. Roofing membrane
3. Root barrier
4. Insulation
5. Gardendrain® Retention/ Drainage/Aeration Component
6. Systemfilter
7. LiteTop® Engineered Lightweight Growing Media
8. Carefully selected plants



Purple roof technology was put to good use at the Hilton 2.0 in Columbus. According to purple-roof.com, “During construction, it was determined that the original stormwater tank as designed was undersized. Horizontal expansion of the tank was cost-prohibitive due to structural factors, and vertical expansion would mean raising the lobby floor, which would radically change the aesthetic.” The solution: Upgrade the 14,500-square-foot extensive

green roof with a purple roof to manage the stormwater on the roof and eliminate the storage tank entirely. ...Overall, “rooftop detention provided maximum efficiency of space, design flexibility, and over \$250,000 in ROI,” according to purple-roof.com.

Green Roof “Master Gardeners”

For stormwater management, blue and purple roofs work with Hydrotech’s diverse

family of green roofing systems all designed to retain, delay, reduce, and clean stormwater. At the heart of most Hydrotech Garden Roof® Assemblies is the Gardendrain® layer, a honeycomb-like series of voids, or cups, paired with channels on the top and bottom sides. The entire system is calibrated for effective water drainage, retention, and aeration.

Hunter describes this vital layer: “The Gardendrain layer comes in 4 x 8 sheets resembling an egg carton. The water percolates through the growing media and sits in the cups. In dry conditions, the growing media will start drawing this moisture back into the root system through transpiration (moisture moving upward through the roots, into the leaves, and ultimately into the air). ... The moisture can work its way back and forth as the weather and precipitation, or the sprinkler system, goes through its cycles.”

According to Hydrotech literature, “excess water can be drained away through channels between the cups. Strategically located holes in Gardendrain provide necessary aeration and ensure that excess moisture found below the cups can air diffuse up into the growing media.”

For effective stormwater management, Hydrotech has developed the Hydrotech Hydrology Tool to accurately predict the performance of its various garden roof assemblies on specific projects. The tool reviews site-specific climatic data, project location historical rainfall data, and other information, coupled with roof characteristics and an analysis of each component in a particular garden roof assembly. The tool then can determine the stormwater storage capacity of the garden roof assembly, show how the assembly will perform during a typical rain event, and assist design teams and owners in developing stormwater management plans.

Sponge Cities

Whether green, blue, or purple, these garden roofing systems, along with bioswales, rain gardens, pervious pavement, and city parks and trees, are part of a growing movement for so-called sponge cities. “Sponge cities are urban areas with abundant natural areas such as trees, lakes, and parks – or other good designs intended to absorb rain and prevent flooding,” according to the website of the United Nations Framework Convention on Climate Change. “Experts say cities need to be designed with this in mind as a growing number of urban areas are experiencing

COMPLETE EXTERIOR ENVELOPE CONTRACTOR

Celebrating 45 Years in Business

Specializing in custom glass, roofing, architectural metal, and waterproofing, Butcher & Butcher has established a reputation for providing the finest workmanship in the building envelope industry. With Michigan locations in Harbor Springs and Rochester Hills, we can complete any project across the state. We are proud to partner with Fleetwood for high-end windows and doors. Stop by our Rochester Hills headquarters to visit our Fleetwood showroom.

BUTCHER & BUTCHER
CONSTRUCTION CO., INC.

FLEETWOOD
WINDOWS & DOORS

bbconstruction.com | 248.852.2323

devastating floods due to climate change.”

Chicago, Washington D.C., and East Coast cities, such as New York, Boston, and Philadelphia, have adopted green roof policies as part of a city-wide stormwater management plan. Even on an individual building basis, “we see the market growing overall,” Serena said. “Each year green roofs are in more and more demand, and although there are many drivers for green roofs, the number one driver is stormwater management.”



The blooms and greenery of this healing garden, dotted with benches and seating, offer a relaxing oasis for Munson Medical Cancer Center patients and their families. Photo courtesy of Inhabitect

Chilling Out on the Roof

Long-term building owners and institutions, such as universities and hospitals, are more apt to invest in a green roof. “They have the forethought and the ability to maintain the green roof,” Hunter said. In urban areas, sustainability-minded and stormwater-conscious companies also invest in green roofs to compensate for limited land area and less green space. For all building owners, a green roof manages stormwater and offers staff a relaxing oasis during the workday. To ease workplace stress, the Federal Reserve in Detroit has a Hydrotech green roof, complete with picnic tables, berms, and bushes. Unlike a blanket of sedums, Hunter said the Federal Reserve project is a semi-intensive green roof with a much lush array of plants and a garden ambiance.

In a different form of chilling out, a green roof cools an individual building, lowering the owner’s energy costs. The widespread adoption of green roofs has the power to reduce the infamous urban heat island effect, resulting in lower temperatures across an entire metropolitan area. “Green roof temperatures can be 30 – 40°F lower than those of conventional roofs and (given a sufficient number of city-wide green roofs) can reduce city-wide ambient temperatures by up to 5°F,” according to the Environmental Protection Agency’s article, “Using Green Roofs to Reduce Heat Islands” on epa.org.

Given its cooling power, a green roof is a perfect companion for solar rooftop panels. “The transpiration of plants has a cooling effect,” Serena said. “This helps solar panels

because a photovoltaic system works better at moderate temperatures.” In Michigan, two Hydrotech green roofs and companion solar panels have been installed on Oakland University buildings, Hunter added.

“In a different form of chilling out, a green roof cools an individual building, lowering the owner’s energy costs. The widespread adoption of green roofs has the power to reduce the infamous urban heat island effect, resulting in lower temperatures across an entire metropolitan area.”

A Place for Goats and Running Tracks

In addition to stormwater management and reducing the urban heat island effect, agricultural space in an urban environment is another benefit of garden roof assemblies. “Our first green agricultural roof was the 15,000-square-foot Gary Comer Youth Center in Chicago,” Serena said. “The

students are in charge of planting and harvesting vegetables, and they learn how to prepare the vegetables.”

Last year, Hydrotech created a one-acre urban farm as part of the expansion of the Jacob K. Javits Convention Center’s existing sedum-covered roof. In this New York City rooftop farm, “they are going to produce 40,000 pounds of produce every year for use in catering trade shows,” Serena said. “A post office in Houston has a one-acre farm that is actually open to the entire community. They can use the plots to grow vegetables; it’s neat to have that community engagement aspect to it.”

As part of the urban agriculture trend, Hunter said that Al Johnson’s Swedish Restaurant in Door County, Wisconsin even has a herd of goats mowing the lawn of its (non-Hydrotech) green roof. While Michigan doesn’t yet have barnyard animals on its rooftops, according to Hunter, one mock-up green roof for a large construction company did attract a pair of nesting Canadian geese.

In addition to agriculture, vegetated rooftops have been repurposed as usable space in other ways. Michigan’s educational institutions and hospitals have integrated fitness tracks and healing gardens into their vegetated roofs. Hunter describes a Hydrotech rooftop garden at the University of Michigan’s Munger Graduate Residents Hall: a running track circles the outer perimeter of the rooftop garden; runners can enjoy the sedums and prairie-type plants blossoming in a retaining wall-type island. In the very

ROOFING

center of the roof expanse, a glass-wrapped portion of the building projects above the roof, offering an interior space for enjoying this lovely expanse of blooms.

Another Michigan example of a Hydrotech rooftop oasis is the healing garden at Munson Medical Cancer Center in Traverse City. "Patients in wheelchairs can sit and relax with family members on the benches placed throughout the green roof," Hunter said.

A One-Stop Sustainability Shop

As living "roofing membranes" carpeted with plants, flowers, and grasses, vegetated roofs offer other sustainability benefits: habitat for pollinators and birds, carbon sequestration, reduction of noise transmission into the building interior, and a lessening of dust and smog. Hydrotech is a one-stop sustainability shop for vegetated roofs. In addition to the 40 percent recycled content of its waterproofing membrane, Hydrotech offers Forest Stewardship Council-certified IPE wood planking as a paver system. For design and construction teams, Hydrotech vegetated roofs provide the opportunity to earn credits in several green building certification programs, including LEED, the International Living Future Institute's Living Building Challenge, the American Society of Landscape Architect's Sustainable Sites Initiative, and Roof Point, a certification program of the Center for Environmental Innovation in Roofing.

Vegetated roofs are a more durable roofing system as well. Beneath the sedum and prairie plants, Hydrotech's garden roofs increase the basic roof's life expectancy because the vegetated roofs are designed as a Hydrotech Protected Membrane Roof (PMR) Assembly. Conventional roofing systems place the waterproofing/roofing membrane above the insulation. Conversely, in a PMR, DuPont's STYROFOAM brand roof



The Belt Line Center building has a 17,250-square-foot extensive green roof and a 2,000-square-foot gravel-ballasted blue roof. A blue roof actually detains stormwater in a rooftop enclosure, in this case, below the gravel-ballasted section. In other cases, the blue roof's enclosure is placed below pedestal pavers or even beneath a green roof's growing media.

Photo courtesy of Inhabitect



CEI Michigan, LLC

Single Ply, BUR, Slate, Shingles, Vegetative Roof Systems, Metal Wall & Roof Panel Systems, Architectural Sheet Metal, Air Barriers, Restorative Solutions, Leak Repairs & Equipment Installation, Roof Audits and Maintenance Programs

BUILT ON INTEGRITY...
GROWING THROUGH SERVICE AND RELIABILITY

- Firestone Inner Circle of Quality
- Sarnafil Elite
- Carlisle ESP
- GAF, Johns Manville
- Armis Metal Systems
- Union Roofing and Sheet Metal Contractor

7750 East M36
Whitmore Lake, MI 48189
517-548-0039 (P)
www.ceigroupllc.com



Hydrotech's GardNet and other components of its sloped garden roof assemblies were used in The Reach - the John F. Kennedy Center for the Performing Arts' recent expansion project in Washington, D.C. In several areas, the roof slope's geometry twisted from flat to vertical like a corkscrew. Photo courtesy of Hydrotech

insulation, a highly moisture-resistant, closed-cell polystyrene, is placed above the waterproof/roofing membrane (MM 6125) to protect it from any damage. Even in a vegetated roof, if the roofing membrane is placed traditionally (above the insulation) "the membrane is susceptible to physical abuse during installation and to the forces of Mother Nature," according to Hydrotech literature. "Only a vegetated roof like Hydrotech's Garden Roof Assembly can provide all the benefits of a PMR."

A One-Stop Customized Shop

Hydrotech and R.M. Hunter offer clients a one-stop shop for a full range of components. With the exception of plants beyond sedum, "we offer a systems approach," Hunter said, "meaning everything from the waterproofing membrane to every layer of the green roof and even the pavers."

Plant Selection

The customer's choice of plant type and maintenance intensity drives green roof design. Each customer has to select plants with an eye to future maintenance. "We're seeing more demand for native and prairie-type plants on roofs," Serena said, "but they require a decent amount of maintenance. Certain species will out-compete and produce weeds." It's all about identifying the types of plants and the level of maintenance a building owner is willing to accept.

Surprisingly, Hunter said another driver of appropriate plant selection is light reflectivity. Artificial light continually beaming

from adjacent windows can cause some rooftop plants to fail. Different plant species may have to be planted in these areas. High winds call for certain plant species as well. At two high-rise hospital facilities in Michigan, Hunter even had to install protective shielding in some areas to protect some of the plantings.

LiteTop® Engineered Lightweight Growing Media

In peeling away the multiple layers beneath the fresh "bouquet" of blooming plants, the first layer is the LiteTop® Engineered Growing Media. According to Hydrotech literature, "Hydrotech's LiteTop is a low-weight mix with ideal aggregate size and components, pH values, nutrients, and the proper degree of porosity and permeability." Unlike traditional landscape soil, this lightweight engineered growing mix is "a long-term structurally stable mix made up of mostly lightweight aggregates so that the roof will not incur volume loss or any long-term drainage issues," Serena added.

Hydrotech can modify and customize almost every component to meet project-specific conditions. The easily modified blends of Hydrotech's LiteTop® Engineered Lightweight Growing Media is a prime example. In engineering the growing mix of a vegetated roof for a Houston post office rehabilitation with tight structural limitations, "we did a blend that weighed around 60 pounds a cubic foot whereas a typical blend would be around 90 pounds a cubic foot," Serena said.



"Builder's Best Friend"

- construction street sweeping
- construction street scraping
- vacuum sweeping
- asphalt repair
- power washing



734-421-6664

www.rjrservices.com



"Builder's Best Friend"

- custom landscape design
- irrigation services
- land development plantings
- landscape maintenance
- landscape enhancements
- site soil stabilization
- hardscape
- state certified soil erosion inspection



734-427-0030

www.daalexander.com

Gardendrain Options

A system filter, placed below the growing media, prevents fine particles from being washed out of the growing media and root zone and into the drainage system. As the next layer, Gardendrain both retains and drains water, along with offering an aeration component.

The versatile Gardendrain system offers three different options depending

“on the type of plant life on the roof, and in turn, the thickness of the growing media,” Hunter said. “GR15 is an egg carton type used for sedum, or extensive, roofs. For prairie grasses and similar plantings, the cups of the egg carton are filled with lightweight aggregate as part of the GR30 option.” The lightweight aggregate helps to maintain soil moisture and supports greater water capacity for roofs with a

greater depth of growing media. As the third option, GR50 has aggregate-filled cups for intensive roofs with trees and more elaborate gardens.

In an extensive vegetated roof assembly, beneath Gardendrain is DuPont’s moisture-resistant insulation, followed by a root barrier that prevents roofs from damaging the MM 6125 roofing membrane.

Hydrotech’s family of green roofs includes sedum-dominant extensive roofs and extensive green roofs with needled, or more durable, rock mineral wool for increased stormwater retention. Hydrotech’s other types of vegetated roofs include green roofs of pure lawn, intensive roofs with shrubs and even sizeable trees, along with sloped green roofs and InstaGreen® GT-4 Tray systems.

From Gardendrain to Hydrodrain and other variations, Hydrotech’s garden roof assemblies have an endless array of layers and components to achieve the design vision of the architectural team and the dream garden roof of every building owner.

As green, blue, and purple roofs increase across a metropolitan area, the vegetated roof can become part of the solution for controlling stormwater, reducing the urban heat island effect, and even in turning a roof into a productive space for food production. And from sedum-covered roofs at the University of Michigan’s C.S. Mott Children’s Hospital and Von Voigtlander Women’s Hospital and the Samuel and Jean Frankel Cardiovascular Center to a complex sloped roof assembly for the U.S Customs and Border Protection building in Sault Ste. Marie (see page 33), Hydrotech’s and R.M. Hunter’s projects are equally varied, expertly engineered, and always green and beautiful.

Finally!

At CAMComp we **PAY OUR MEMBERS BACK** for working safely!

Access MI recently joined the **CAMComp Workers' Compensation Plan!**

When asked what they would tell someone considering joining, here's what they had to say:

“The staff at CAMComp quickly puts you at ease. From the moment you are in contact with them, you feel that they are on your side and only want to help you.”

CAMComp's Loss Control Consultant *“has been very informative and personal. She truly cares about making sure we have all the information to keep our employees safe.”*



If you are ready to reap all the benefits of keeping your workers safe, then take action and reach out to:

Michelle Mage
586-790-7810 | mmage@camcomp.net

We are here to answer all your questions and get you a quick quote.

www.camcomp.net





Hydrotech uses the tension from stainless steel cables and the placement of the growing media in octagonal-shaped sections of a honeycombed geo-web, called GardNet®, to hold the sloped assembly in place. GardNet's ability to conform to irregular slopes makes it ideal for complex and undulating roofs with steep slopes involving convex, concave, and compound surfaces. Photo courtesy of Hydrotech

Roofing North of the 45th Parallel

The Soo's Complex Sloped Roof Assembly Welcomes Travelers to Michigan

Jim Hunter stood on a rooftop in Sault Ste. Marie, admiring the distant view of Canada's Algoma highlands to the north and the undulating carpet of sedum directly below his feet. As president of R.M. Hunter Co., he worked directly with Hydrotech to bring this unique sloped roof assembly north of the 45th parallel. The vegetated roof's undulations and angles are a testament to the expertise of both companies.

With its multiple slopes and living plants, the roof has graced the U.S. Customs and Border Protection building at the Sault Sainte Marie Port of Entry for several years. The roof's longevity in the face of the scouring winds and bitter cold of a site close to the St. Mary's River and downstream from Lake Superior is proof positive that Hydrotech is one of the industry's leaders in sloped roof assemblies.

EME 25⁺ YEARS
1997 - 2023

Environmental Maintenance Engineers, Inc.
25851 Trowbridge St., Inkster, MI 48141
313.791.2600 - www.teamEME.com

**Asbestos & Lead Paint Abatement, Mold
Remediation, Universal Waste & Pigeon Debris**

EME is also licensed in Ohio for asbestos abatement

“Originally, the winning bidder’s first system was actually sliding off the roof with the insulation blowing away in large sections due to the area’s high winds,” Hunter said. With the first system having major issues, U.S. Customs turned to Hydrotech’s well-engineered system to re-blanket this complex rooftop.

For a stable sloped roof, Hunter said Hydrotech uses the tension from stainless

steel cables and the placement of the growing media in octagonal-shaped sections of a honeycombed geo-web to hold the sloped assembly in place. Kevin Serena, Hydrotech, Central Region Technical Sales, explains the basics of Hydrotech’s sloped roof assemblies: “We connect the geo-web material at the ridge line of the roof with stainless steel cables spaced every 13 or every 26 inches, depending on project



ALTA EQUIPMENT COMPANY

SALES | SERVICE | PARTS | RENTAL

YOUR PARTNER IN CONSTRUCTION EQUIPMENT



Contractors and construction companies throughout the Midwest look to Alta Equipment Company as their source for construction equipment, from excavators to compactors. Our team of highly-trained specialists will guide you through the buying process to ensure that you walk away with the right piece of equipment and a preventative maintenance plan to keep it running smoothly.

Call us at **844.Go2.ALTA** or visit us online at **ALTAEQUIPMENT.COM**

ALTA EQUIPMENT COMPANY Burton | Byron Center | Detroit | New Hudson | Sault Ste. Marie | Traverse City

specifics. Washer assemblies go down along the slope at a spacing determined by the degree of slope, the length of run, and how deep the growing media is.

“Hydrotech does all the engineering to determine how thick the stainless steel cables need to be, what the pullout strength needs to be at the bracket, and how often those washer assemblies need to be spaced,” Serena added.

Essentially, every sloped green roof is custom for Hydrotech. “We want to meet the design intent of the project team,” Serena said. “...The architect gives us the design and the slopes they want to hit, and what area they want sloping and to what degree. We take all of that information in and let them know how to get it built.”

Hydrotech recommends a sloped garden roof assembly for roofs with over a 3:12 pitch. “But once you get to a 2:12 slope, we would start considering whether a normal assembly is okay or if the roof might need a sloped assembly,” Serena said. He estimates that the Sault Ste. Marie U.S. Customs and Border Protection building has close to a 5:12 or even a 6:12 pitch. “You actually feel as if you’re walking up a hill when you get on that roof,” Hunter commented.



With its multiple slopes and living plants, this sloped roof assembly has been blooming atop the U.S. Customs and Border Protection building at the Sault Sainte Marie Port of Entry for several years. Photo courtesy of Hydrotech

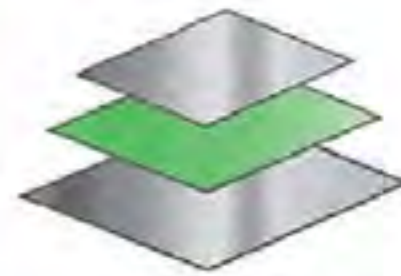
GardNet®, the official name of this geo-web material, is a growing media confinement component manufactured from high-density polyethylene. According to Hydrotech literature, "Its ability to conform to irregular slopes makes it ideal for complex and undulating roofs with steep slopes involving convex, concave, and compound surfaces."

For installation, growing media was blown onto the roof from a truck and a type of chute. The alternative was to hoist large sacks of growing media with a crane. By blowing the soil, the crew "could place it in the honeycomb geo-web and fill those voids much easier," Hunter said. "Then the sedum just unrolls almost like a sleeping bag." Inhabitect is the maintenance contractor for this unique Sault Ste. Marie project.

In 2020, Hydrotech's GardNet and other components were used in The Reach - the John F. Kennedy Center for the Performing Arts' recent expansion project in Washington, D.C. According to Hydrotech's website, "Among the most challenging aspects of the green roof were several areas where the roof slope geometry twisted from flat to vertical like a corkscrew. Four complex-shaped roof areas were referred to as 'Swoops'. The slope of the large Swoop varied from 0 degrees to 90 degrees. Hydrotech's GardNet slope stabilization assembly proved ideal for these complex, three-dimensional roof deck shapes."

Clearly, Hydrotech's custom slope assemblies are made for experimental design, whether brought to life in the forest-enveloped towns of Michigan's Upper Peninsula or in Washington, D.C. "Designers want to get more and more creative, and push the envelope," Serena said. "I think that is a fast-moving, fast-evolving niche market in construction." ❖

-By Mary Kremposky McArdle



OAKLAND
METAL SALES INC

Copper

- ▶ Cold Rolled Copper Sheet and Coil in 12oz-.125
- ▶ Lead Coat, 16 & 20oz
- ▶ Freedom Gray Z-T Alloy Coated Copper, 16 & 20oz
- ▶ Revere Continental Bronze
- ▶ Copper Bar

Aluminum

- ▶ Mill Finish .025-.125
- ▶ Anodized Aluminum .032-.125
- ▶ Kynar 500®/Hylar 5000® Pre-Finished Sheets .032-.063

Stainless Steel

- ▶ 10ga-28ga Sheets 2B & #4 Finishes

Kynar 500®/Hylar 5000® Pre-Finished Galvanized Steel Sheets

- ▶ Roofing and Wall Systems in Many Profiles from Different Manufacturers

Galvanized, Galvalume, Bonderized Steel Sheets

Rheinzink Sheet & Coil

Lead Sheets

Gutter Systems

- ▶ Copper: American & European Styles
- ▶ Rheinzink
- ▶ Pre-Finished Steel & Aluminum

Custom Fabricated Brake Metal

Andek Roofing & Wall Coatings

Additional Stock Items

- ▶ Snow Guards
- ▶ Solder-Flux-Irons
- ▶ Copper & Stainless Steel Nails - Driven & Collated

**CONTACT US TODAY
FOR ALL YOUR METAL NEEDS!**

WWW.OAKLANDMETALSALES.COM

Phone: (248) 377-8847

Fax: (248) 377-4196

Email: info@oaklandmetalsales.com

Family Owned & Operated Since 1984