LiveRoof® BRAND

Dedicated to Your Success

The Proof is in the Roof™!

DESIGN GUIDE

and Designer's Check List

10,350,389+	5,311+	16	11
SqFt Installed	Projects	Years in Business	Countries

LiveRoof® BRAND
Hybrid Green Roof System

Design Guide & Checklist

This design guide is a supplement to the LiveRoof catalog, with the purpose of demonstrating different planting methods for the different LiveRoof system options.

With each system (Standard, Deep, Lite, X-Lite and Maxx), we address the following topics:

What it Does
Which Plants Work
How it Looks
What it Needs
How it's Grown
Comparative Cost

We want you to realize optimal value and beauty with each and every LiveRoof installation. Hopefully this information is valuable to you, and if there is anything you need, please call. We are here to serve you.

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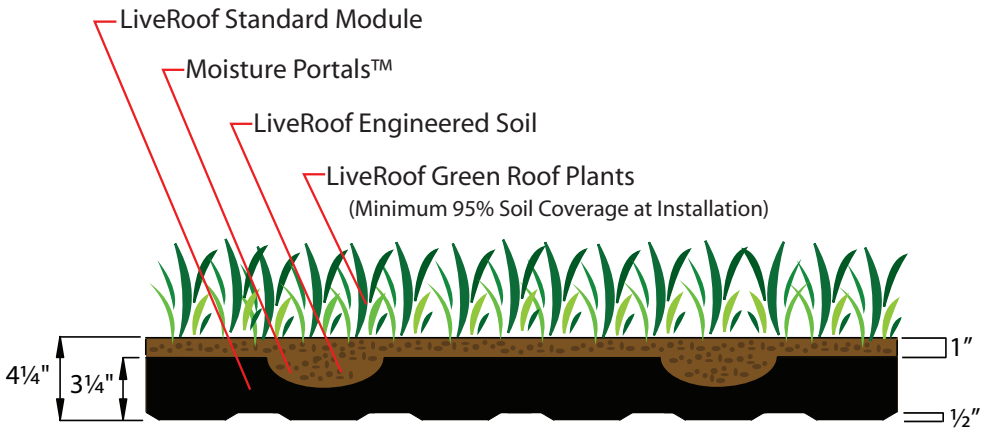
LiveRoof® BRAND
Hybrid Green Roof System

Standard System

Soil Depth: Appx. 4 1/4"

Module Size: 1' x 2' x 3 1/4"

Weight: Appx. 27-29 lbs/sf saturated and vegetated.



What it is. The Standard System is the workhorse, used on 80+% of LiveRoof projects. At 4.25 inch soil depth it is the popular choice for most new construction projects and many retrofits. With a saturated weight of 27-29 lb/sf, it is the perfect convergence of functional merits, cost and versatility.

What it Does. It provides exceptional storm water management, significant energy savings—even more if irrigated during the warm season. It is commonly used to meet greenspace requirements, provides modest biodiversity, supporting pollinators such as butterflies and honeybees, and will grow a palette of beautiful low maintenance plants—broad enough for both simple and relatively intricate designs. On top of this, the Standard System can seamlessly transition to the Deep and Maxx Systems without need for edging in between.

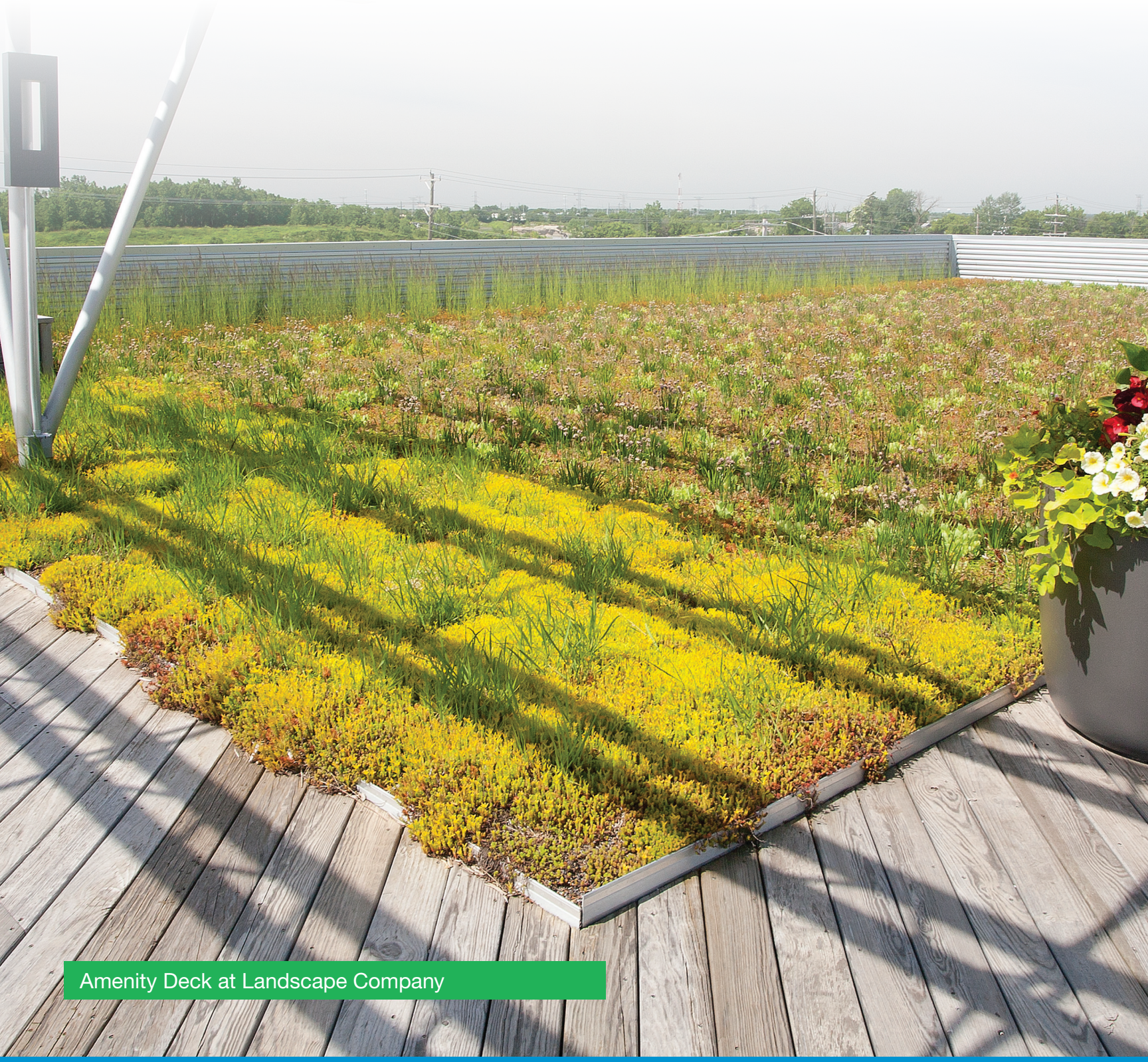
What Plants Work. The type of plants used in the Standard System include a full array of low to tall growing sedums—from fine to very coarse-textured, green, yellow, blue, maroon and multi-colored. Flowers range from white, yellow, pink or purple. Alliums of all sizes are compatible and with regular irrigation a few low-growing grasses such as little bluestem or prairie dropseed are possible, as are a few broad leaved non-succulent perennials.

How it Looks. Because the sedum plants range from fine- to very coarse-textured, and very short to quite tall, the look can vary according to the needs of the project. If one wants a fine-textured mosslike look it can be accomplished easily. But, course-textured and prairie-like are doable as well. Broad expanses are often planted, and more intricate patterns are done as well.

What it Needs. With 4 ¼ inches of soil, the Standard System has pretty good water holding capacity, at least for succulent plants. But, when the summers are hot, it can dry down to the point where even sedums need irrigation. And, given that climates everywhere are warming, we recommend irrigation as an inexpensive insurance policy—at least on moderate to large roofs. And, while many Standard Systems are installed without built-in irrigation, we are strong proponents of having a built-in irrigation system. It's cheap insurance and by watering occasionally, 1X per week with 1 inch of water, you can keep your plants thick and lush even through drought and heat—this makes maintenance easy and it looks nice. What's more, if you keep some moisture in the soil, you will optimize evaporative cooling and save substantially on cooling costs. In any geographic area that has access to irrigation water, this is a win-win scenario, in respect to energy and resource savings. Other than that, soil fertility should be managed attentively; typically one application of high quality sulfur coated fertilizer each spring is sufficient. LiveRoof's Smart Weeding™ method should be followed regardless of geography (this is where the maintenance person takes a short "weed walk" every two weeks during the growing season—thus preventing the few baby weeds from growing up and having offspring).

How it's Grown. The base succulent plants are usually started from an assortment of cuttings that are mixed together, applied to the soil surface, and grown to maturity in the nursery setting. Occasionally, particularly if the designer is looking for something unique, the plant palette can be started from a combination of sedum cuttings and taller accent plants. Accent plants are typically planted from plugs or divisions. In any event, each Standard System project is delivered fully grown (a process that typically takes 8 to 12 weeks depending upon climate and plant selections).

Comparative Cost. The Standard System is economical and pricing will vary somewhat with the plant selections. It installs quickly and easily and can usually be custom grown in just a few months.



Amenity Deck at Landscape Company

Standard System

FINE-TEXTURED BASE-PLANT PALETTE

By blending several fine-textured sedums, one can create a palette reminiscent of moss. This makes spaces seem more expansive.

Train Station

Apartment Complex

Biotech Company

Standard System

MEDIUM-TEXTURED BASE-PLANT PALETTE

The palette of medium-textured sedums is quite extensive, with foliage colors ranging from green to red, yellow or maroon, and multicolored. With a blend of medium-textured base plants blended, typically 5 to 10 varieties, it is easy to create a dense growing carpet-like appearance with a succession of flowers, which come in shades of white, yellow, pink and red.

Standard System

COARSE-TEXTURED BASE-PLANT PALETTE

A few of the sedum base plants are extra course-textured and a bit taller growing. By adding a few of these into the mix, it's possible to create a richness that goes beyond the traditional sedum assortments.

Comdominium Development

Public Transit Operations Center

Zoo

Standard System

RANDOM ASSORTMENT OF COMPLEMENTARY PLANT BLENDS

These two roofs are composed of randomly placed assortments of different plant blends. This method can create very striking yet naturalistic green roofs. When using this approach, specify 3 to 5 different plant assortments and instruct the grower and installer to load and install the modules randomly. For smaller roofs, ask your grower if they happen to have any remnants on hand that can be blended together.

Boat Storage at University Research Institute

Game Machine Manufacturer

Standard System

PLUGS WITH CUTTINGS

This is a favorite design, and while you don't see this planting style very often; it's the look you get when you first plant sedum plugs in a linear fashion, then broadcast a mixture of lower growing mosslike sedum cuttings over the top, which root in like carpet around the plugs. What you end up with is something reminiscent of a richly textured berber carpet.

Mixed Use Development

Standard System

MEDIUM-TEXTURED BASE-PLANT PALETTE WITH PLUG-PLANTED ACCENT PLANTS

This roof shows how upright plug-planted accent plants such as Allium ‘Pink Giant’ and Sedum ‘Karl’ can create rich texture.

Standard System

COARSE-TEXTURED BASE-PLANT PALETTE WITH PLUG-PLANTED ACCENT PLANTS

This look is created by introducing a few plug-planted vertically growing alliums and sedums, for accent, into a blend of lower growing sedums. The richness that can be created with only 4.25" soil depth is remarkable. What's more, this planting style broadens the biodiversity of the roof which translates into a broader community of invertebrate and bird species, compared to a roof composed entirely of sedums.

Urban Residence

Insurance Company Headquarters

Standard System

CURVILINEAR PATTERNS

Patterns such as these, while curvilinear, are very easy and fast to install. Sometimes modules are set in place in a stair-step fashion and soon the plants grow just enough to round out the edges. Another option is to grow the pattern in place at the nursery, then install the planting according to the pre-grown pattern. The process is fairly simple and done routinely.

Hospital

Medical Research Institute

Standard System

CURVILINEAR PATTERN WITH COARSE TEXTURED BASE & ACCENT PLANTS

This curvilinear patterned roof includes not only color differences, but textural differences and artistic use of edging.

Private Residence

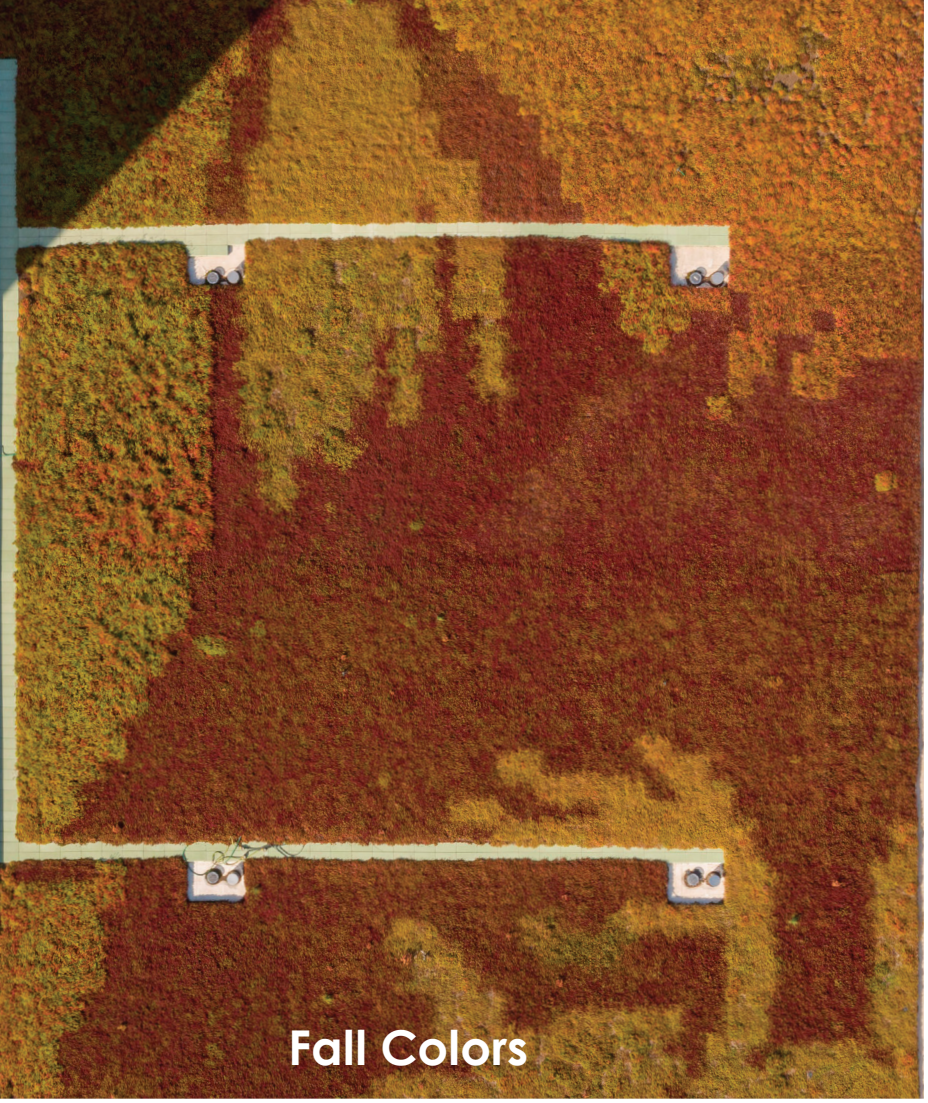
Standard System

ARTISTIC EXPRESSION

Imagine if you were a patient in this cancer treatment hospital, wouldn't you prefer to see this message of caring instead of looking at tar, rubber or gravel?

Cancer Treatment Hospital

Community College



Fall Colors

How do you create a wolf's face with a LiveRoof?

Easy, first draw it.

Then outline it on the soil (with spray paint).

Then plant, and grow it.

When it's time to ship it, label each module with a number.

Then, install it number by number.

This 10,000 sq. foot installation was done in 3 days!

Any rooftop that is visible presents a great opportunity for branding and artistic expression.

University Athletic Facility

Spring Colors

Standard System

RECTILINEAR PATTERNS

This rectilinear pattern is simple, inexpensive to grow and install, but oh so effective. Notice how there are only two different plant mixes. The genius is in the plant selection, the varying width of the color bands, and the lovely detail work utilizing both gravel ballast and LiveRoofs' RoofStone pavers.

Hosptial

EXIT

Standard System

RECTILINEAR PATTERNS

Rectilinear patterns are easy to install and care for. They can be basic with a single mix of plants, or complex utilizing numerous colors and textures. Accent plants can be added for interest and increased biodiversity.

Climate Controlled Multi-tenant Storage

Office Redevelopment

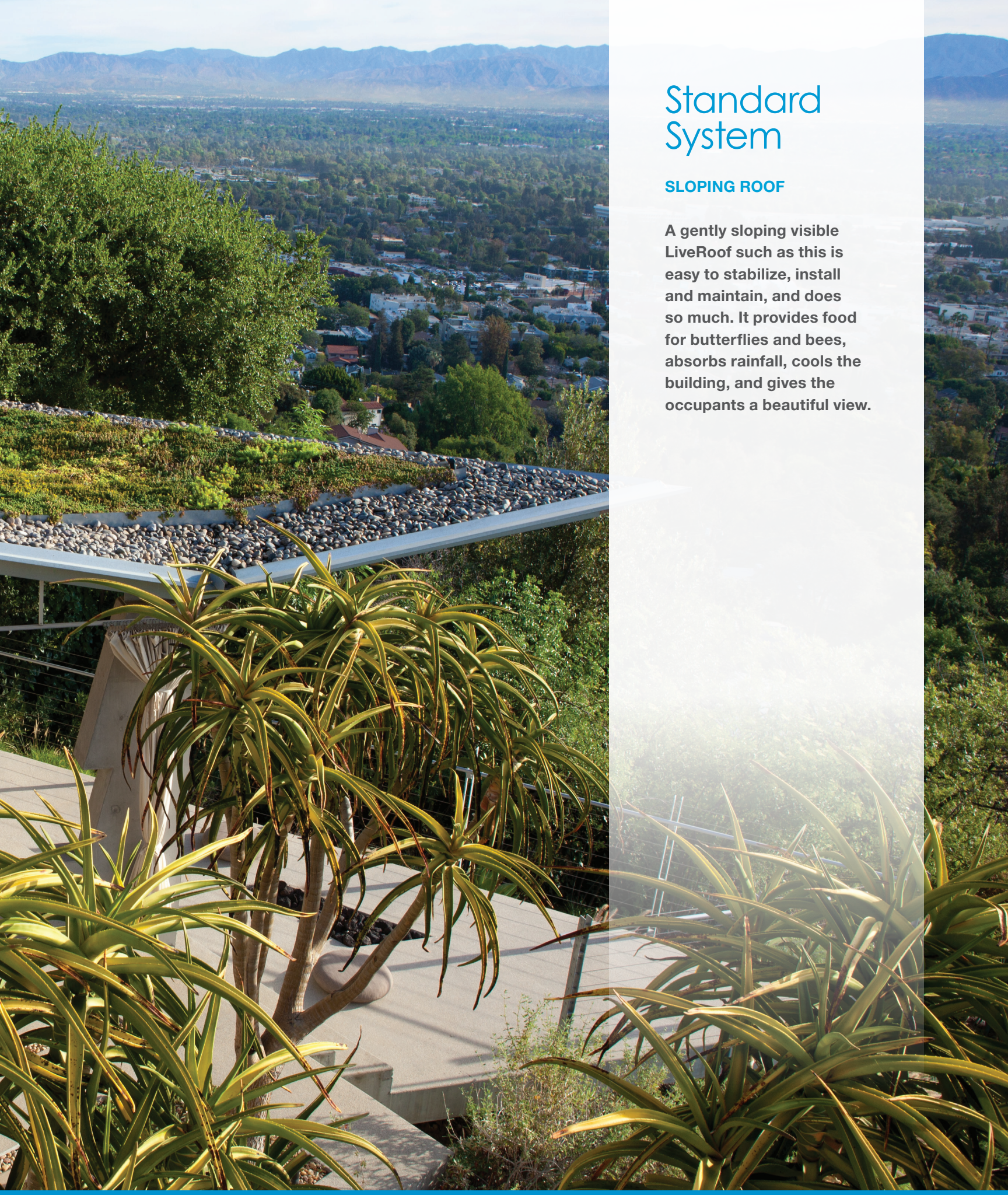
Standard System

AMENITY SPACE

Bench seating and pavers turn this handsome California LiveRoof into useful bonus space for a quiet lunch or boisterous after-hours gathering.

University Student Union Rooftop Deck

Residential Pool House Canopy



Standard System

SLOPING ROOF

A gently sloping visible LiveRoof such as this is easy to stabilize, install and maintain, and does so much. It provides food for butterflies and bees, absorbs rainfall, cools the building, and gives the occupants a beautiful view.

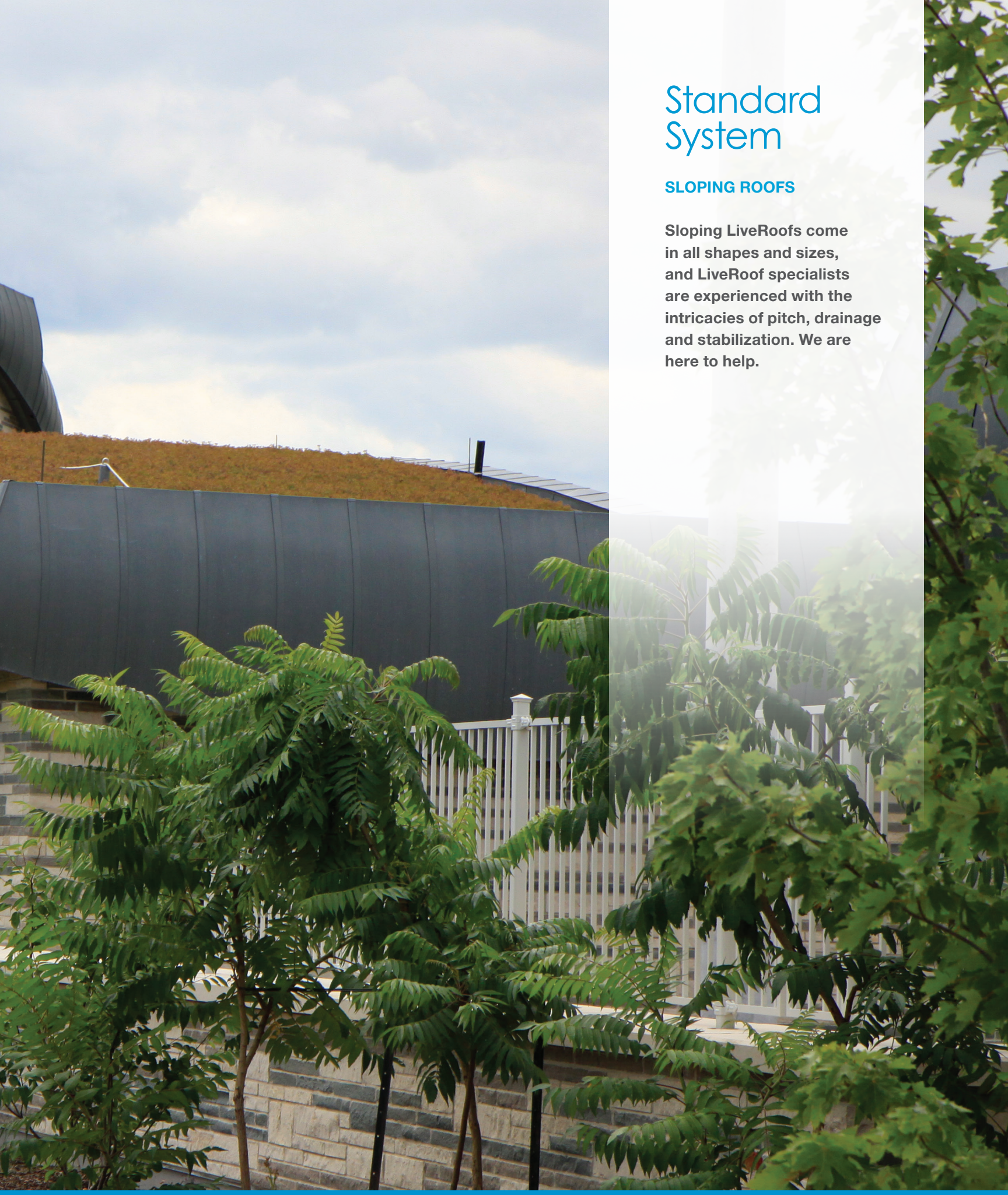
Residential High Rise Amenity Deck

Standard System

SLOPING ROOFS

Sloping LiveRoofs, whether curved or linear can be quite dramatic—and the more pitch there is the more important it is to be attentive to stabilization. Both the LiveRoof website and LiveRoof product catalog illustrate various methods of stabilization.

Transit Station



Standard System

SLOPING ROOFS

Sloping LiveRoofs come in all shapes and sizes, and LiveRoof specialists are experienced with the intricacies of pitch, drainage and stabilization. We are here to help.

Standard System

SLOPING ROOFS

Sloping LiveRoofs allow for ground-level viewing.

Mixed Use Development

Standard System

AT-GRADE APPLICATION

There are times when hard surfaces are overdone and need to be replaced with plants to balance the living and inanimate components of the landscape. This project involved applying LiveRoof at grade, above concrete. It took only a short while to install, and the aesthetic and ecological benefits were instantaneous.

University Campus

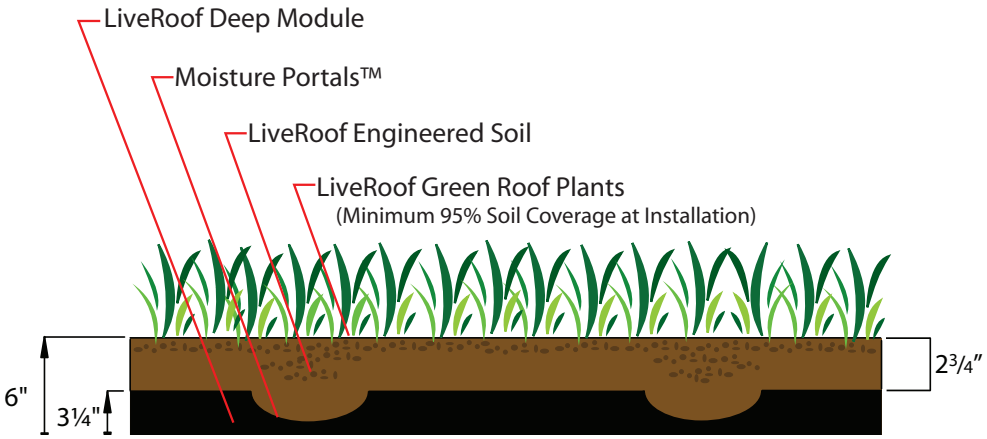
LiveRoof® BRAND
Hybrid Green Roof System

Deep System

Soil Depth: Appx. 6"

Module Size: 1' x 2' x 3 1/4"

Weight: Appx. 40-50 lbs/sf saturated and vegetated.



What it is. The Deep System is used for biodiverse green roofs. With 6 inch soil depth it becomes possible to support a broad array of non-succulent plants. One can literally create a prairie or shade garden on the roof. Naturally the weight is greater, appx. 40-50 pounds per square foot, depending upon soil and plants, but the weight is not so heavy as to greatly drive up the cost of the supporting structure.

What it Does. It is primarily used for biodiversity, prairies and gardenlike perennial plantings. It also allows for food growing and shade planting, on roofs that are too shady for succulent plants. The Deep System is excellent for saving energy, good for storm water management, and easily meets most greenspace requirements. Because it can support a broad array of plants, it can provide habitat and food for pollinators such as butterflies and honeybees and various bird species. Plantings can be random and naturalistic as well as patterned. The Deep System also seamlessly transitions to the Standard or Maxx System without need for edging in between.

What Plants Work. The type of plants used in the Deep System include a full array of low to tall growing sedums, hundreds of different fibrous rooted herbaceous perennials, including native forbs, sedges, grasses and edible plants. But, one should avoid plants with woody root systems such as shrubs, as they can damage waterproofing. Foliage colors can vary widely; green, yellow, red, purple and blue are possible, and flowers of any color and shape are found within the broad palette of plants capable of growing in its 6 inch soil profile.

How it Looks. Its appearance is determined by plant selection, and often the plants are arranged in naturalistic sweeps or planted randomly when creating prairie habitat. And, because roofs are often windy, grasses are commonly employed for an added element of motion.

What it Needs. You might think that with 6 inches of soil, the Deep System would have tremendous water holding capacity, and it does. However, the plants that are used are typically not the type that store water, like the succulents used in the thinner soil profiles. Therefore, whenever the Deep System is used, one must include a built-in spray rotor irrigation system in the design. Spray rotor heads should be used, as (in the gravelly soils used for green roofs) they use considerably less water than drip or sub irrigation methods. Irrigation frequency will vary with climate and plant types, but in general it will need irrigation every 3 or 4 days during the summer months. Maintenance is more involved than with the other systems, but less than traditional landscape plantings as LiveRoof soil is not full of weed seeds like typical topsoil.

How it's Grown. Many designers prefer to include a base layer of succulent sedums, as a living mulch, in conjunction with the core accent plants, which are planted from plugs and grown on at the nursery until well rooted. It is important to provide plenty of advance notice to your LiveRoof grower if any uncommon species or quantities are needed. Grow time ranges from approximately 10 to 16 weeks depending upon climate and plant selections.

Comparative Cost and Installation.

The Deep System is more costly than the Standard System because of the soil depth, plant types, and relatively longer installation time. But, like the other systems it is a remarkable investment that pays off with energy savings, extension of the roof life, beauty, code compliance, quality of life, and so much more.

Botanical Garden Amenity Deck and Sculpture Garden

Botanical Garden Accessible Roof

Deep System

FOR NATURALIZED & GARDEN LIKE DESIGN

These Deep Systems are used for greater biodiversity; 6 inches of soil is sufficient to support many non-succulent plants. One can create a prairie or biodiverse perennial garden on the rooftop.

Residence

Deep System

RICH IN BIODIVERSITY

This native-only LiveRoof is designed to provide habitat, cooling, energy conservation, storm water retention and beauty.

Condominium Roof

Deep System

SMALL PROJECTS

Not every Deep LiveRoof Project is large; in fact small installations are well worth the effort. The improved view, enhanced storm water performance, energy savings and habitat creation of these lovely installations took only a few hours to accomplish.

Marina Bathhouses

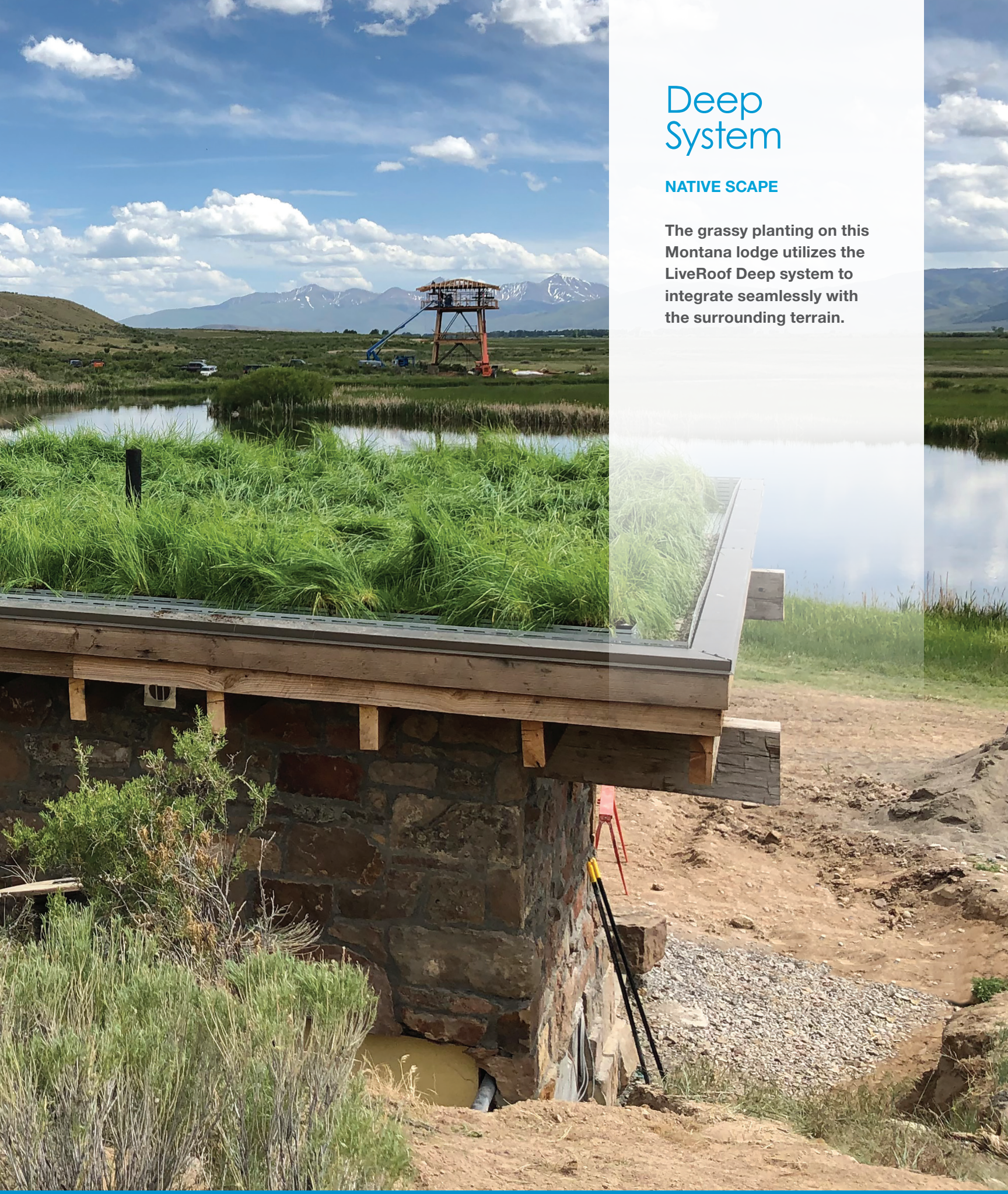
Residence

Fishing Shack

Deep System

NATIVE SCAPE

The grassy planting on this Montana lodge utilizes the LiveRoof Deep system to integrate seamlessly with the surrounding terrain.



Standard & Deep Systems Combined

Here the Deep System is used to grow the tall Karl Forester grass, while the base mix of sedums is contained within the Standard LiveRoof System.

Corporate Office Space of Respite and Regeneration

Standard & Deep Systems Combined

The creative minds that designed this LiveRoof were able to develop substantial elevation changes using closed cell foam. The background Allium plants, in raised planters, are growing in the LiveRoof standard module—above the sweep of grasses and Penstemon in the foreground (growing in the LiveRoof Deep system). Located in downtown Chicago, this installation is an urban oasis providing habitat to birds, bees and butterflies, and a comfortable escape for employees of the adjoining offices.

Amenity Deck and Roof Garden

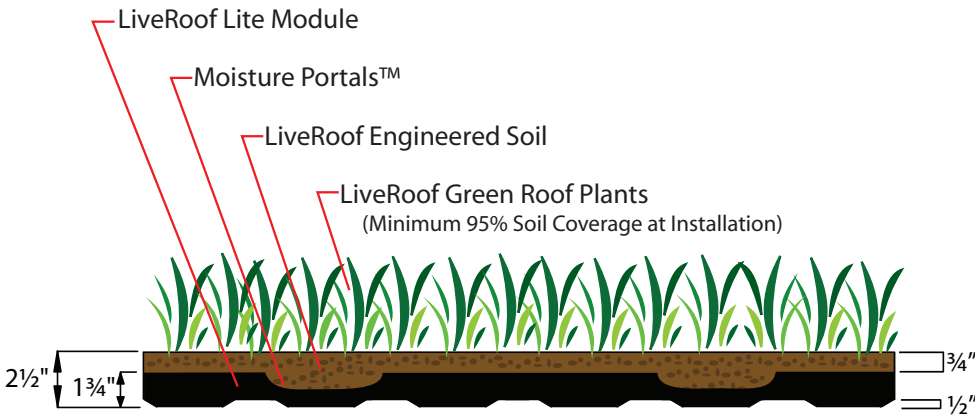
LiveRoof® BRAND Lite System

Hybrid Green Roof System

Soil Depth: Appx. 2 1/2"

Module Size: 1' x 2' x 1 3/4"

Weight: Appx. 15-17 lbs/sf saturated and vegetated.



What it is. The Lite System is typically used on retrofit projects when the roof is engineered with only 15 to 17 pounds per sf for the green roof component. Its soil depth is a full 2 ½ inches, enough to support many low growing succulents and a limited number of accent plants. It is generally not recommended for hot climates.

What it Does. It provides a modest level of storm water management, modest energy savings—especially if attentively irrigated during the warm season. It also meets greenspace requirements in many instances, and provides limited biodiversity. Its plants will support pollinators such as butterflies and honeybees, and the plants that grow in the Lite System are diverse enough to support patterned designs.

What Plants Work. The plants used in the Lite System include a fairly broad range of low growing sedums—mostly fine- and medium-textured, as well as a few alliums, for vertical and textural interest.

How it Looks. Because the sedum plants used with this system are fine to medium-textured and relatively low growing, designs can vary from mosslike to medium-textured (similar to a lawn). Foliage colors can vary from green, to yellow, red and blue, and flowers from white, yellow, and pink to reddish. Various low growing (6"-10" tall) Alliums can be used for accent and they typically have green or bluish foliage and flowers of white, pink or purple.

What it Needs. Because the Lite System has only 2 ½ inches of soil, it will dry out regularly during summer. Therefore, we strongly recommend a built-in irrigation system. During typical summertime weather, it should be watered once per week, usually for 25-30 minutes (about 1 inch of water). Soil fertility should be managed attentively; typically one application of a high quality sulfur coated fertilizer each spring is adequate. LiveRoof's Smart Weeding™ method should be followed (where the maintenance person takes a short "weed walk" every two weeks during the growing season—thus preventing a few baby weeds from growing up and having offspring).

How it's Grown. The base succulent plants (typically sedums) are usually started from cuttings that are blended, applied to the soil surface, and grown to maturity in the nursery setting. Occasionally, particularly if the designer is looking for something unique, it can be started from a combination of sedum plugs and cuttings. Accent plants, such as Allium, are planted from plugs or divisions as well. When mature, a process that typically takes 8 to 12 weeks depending upon climate, it is delivered to the project site and installed on the roof.

Comparative Cost. The Lite System is economical; it utilizes relatively inexpensive plants, is grown quickly and is fast and easy to install.

Lite System

RETROFIT APPLICATIONS

While the Lite System uses a relatively thin 2 ½ inch soil profile, when irrigated this soil depth is sufficient to support a very nice array of base plants, and a suprising assortment of taller growing accent plants.

Sports Arena

Lite System

LARGE COMMERCIAL SITE

As with all LiveRoof Systems, the Lite System can be employed on projects both large and small. This one is spacious, greater than 30,000 square feet.

Car Dealership

Lite System

WARM CLIMATE

The Lite System is not the first option in warm climates, but this California installation has performed well due to attentive moisture management. In other words, it is watered when needed.

University

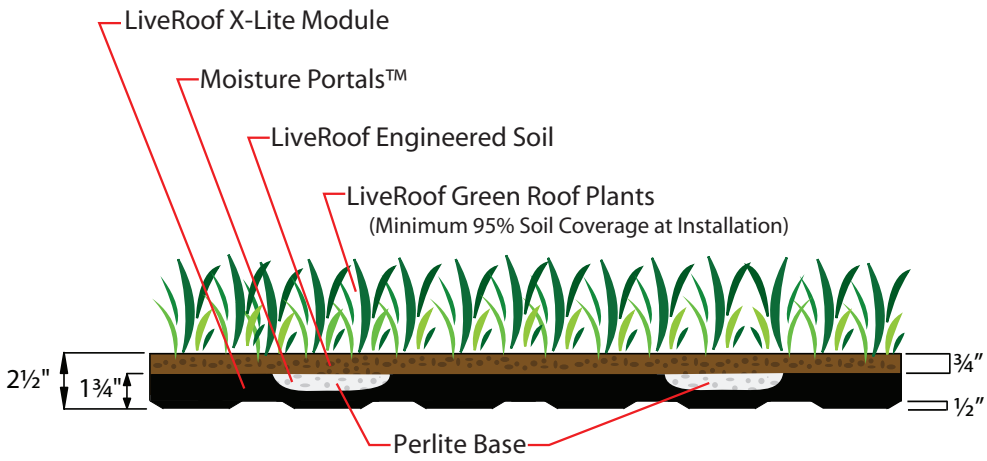
LiveRoof® BRAND
Hybrid Green Roof System

X-Lite System

Soil Depth: Appx. 1 1/2"

Module Size: 1' x 2' x 1 3/4"

Weight: Appx. 10 lbs/sf saturated and vegetated.



What it is. The X-Lite System is used infrequently, but presents an effective solution to roofs that are limited in their structural capacity. It uses the Lite module, but the bottom inch is filled with an inch of specially graded course perlite then topped with 1 ½ inches of LiveRoof engineered soil. The perlite weighs practically nothing, and acts essentially as a drainage course and filler. While the X-Lite System is not for hot climates, in cool climates such as Michigan, New York and Washington, it has proven to be long lived, the oldest installation 10 years old and showing no problems.

What it Does. It provides limited storm water management, offers energy savings and may satisfy municipal greenspace requirements.

What Plants Work. Because of the limited soil depth, the X-Lite System supports only a specialized group of low growing sedums—definitely not all sedums and a select few dwarf Alliums. These types, which we are happy to share, tend to be fine to medium-textured, mostly with green foliage and yellow or white flowers. They are a good food source for honeybees and look quite nice, and are best used in broad expanses rather than patterns (as the color palette is limited and it is difficult to differentiate one mix from another).

How it Looks. Because the plants are fine to medium-textured, and low growing, the designs with the X-Lite System tend to look like a fine-textured sea of green, or yellow when in bloom. The look is reminiscent of a tightly mowed lawn.

What it Needs. Because the X-Lite System has only 1 ½ inches of real soil, it will dry out sooner, and therefore should always have a built in irrigation system. During the summer months, it should be watered once or twice a week, typically for 20-25 minutes (about 3/4 inch of water). Soil fertility should be managed attentively; typically one application of high quality sulfur coat fertilizer during spring is sufficient to keep the plants looking good all season. And, LiveRoof's Smart Weeding™ method should be followed (where the maintenance person takes a short "weed walk" every two weeks during the growing season—thus preventing a few baby weeds from growing up and having offspring).

How it's Grown. The plants are started from cuttings that are blended, applied to the soil surface, rooted, and developed in the nursery setting. It is delivered fully grown and this process takes 8 to 12 weeks depending upon climate.

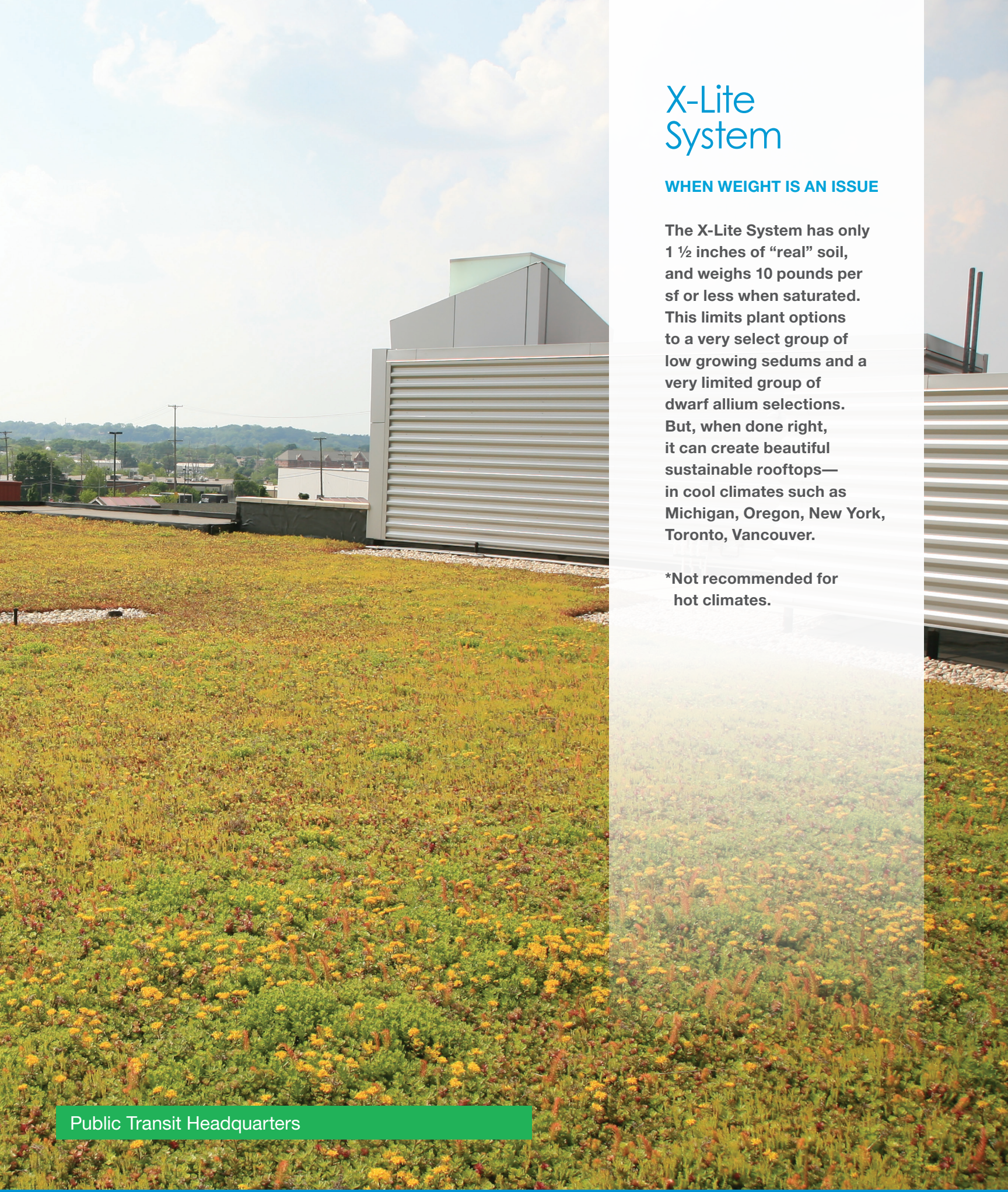
Comparative Cost. The X-Lite System is economical; it utilizes relatively inexpensive plants, grows quickly, and is fast and easy to install.

X-Lite System

WHEN WEIGHT IS AN ISSUE

The X-Lite System has only 1 ½ inches of "real" soil, and weighs 10 pounds per sf or less when saturated. This limits plant options to a very select group of low growing sedums and a very limited group of dwarf allium selections. But, when done right, it can create beautiful sustainable rooftops— in cool climates such as Michigan, Oregon, New York, Toronto, Vancouver.

***Not recommended for hot climates.**



Public Transit Headquarters

Lite System + X-Lite System

RETROFIT LIVEROOF

Looking like a spaceship, this remarkable LiveRoof retrofit installation enhances the roof of a university sports complex (under the dome is a stadium). The planting is a combination of the LiveRoof Lite and X-Lite systems, and is an example of creative design paired with thoughtful engineering (attentiveness to roof load-capacity). The visual effect is breathtaking.

University Sports Complex

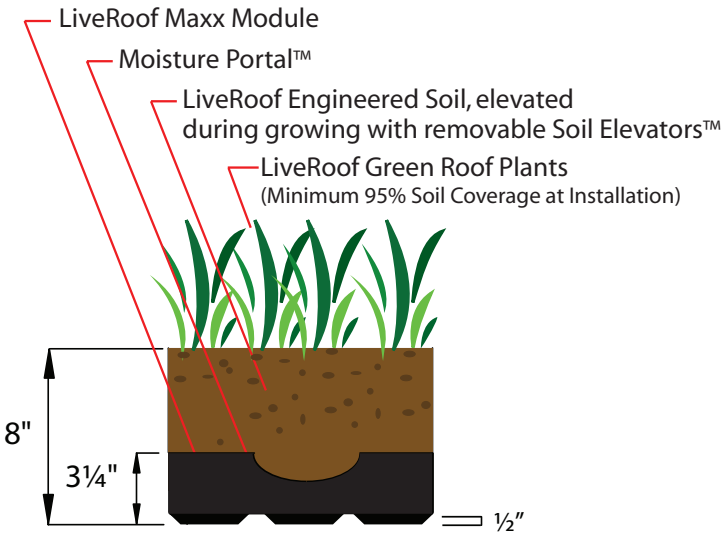
LiveRoof® BRAND
Hybrid Green Roof System

Maxx System

Soil Depth: Appx. 8"

Module Size: 1' x 1' x 3 1/4" integrates with LiveRoof Standard and Deep systems.

Weight: Appx. 60-65 lbs/sf when saturated and vegetated.



What it is. The Maxx System is a niche product for unique needs—such as for vegetable gardening on decks and balconies where access may require carrying the modules up a flight of stairs. There are also a few municipalities that require an 8 inch soil depth for water retention code—which is odd as research indicates that a thinner depth, e.g. 4 inches, is better as it tends to dry down more between storm events. No matter the application, it can be used just like the Deep System to create a biodiverse prairie, sun or shade gardens, and vegetable gardens. Naturally the weight is significant at 60-65 pounds per sf., but usually the installations are small and there is often ample structural capacity on the type of roofs where it is used.

What it Does. It is primarily used for small scale vegetable gardens or for patches of tall accent plants, such as grasses, in conjunction with the standard system.

What Plants Work. The type of plants used in the Maxx System includes many edible plants such as herbs, peppers and tomatoes, kale, beans, carrots, cabbage, even sweet corn. Naturally, it will also support a full array of low to tall growing sedums, hundreds of different fibrous rooted herbaceous perennials (including native forbes, sedges and grasses). But, one should avoid woody plants, such as shrubs, that have woody root systems which might damage waterproofing membranes.

How it Looks. It is usually planted with rows of vegetables and herbs. It can, of course, also be used to create beautiful flower gardens and prairie habitat. Foliage colors span green, yellow, red, purple and blue, and variegated, and flowers of any color and shape are found within the broad palette of plants capable of growing in its 8 inch soil profile.

What it Needs. An automatic irrigation system, with spray rotor heads is recommended. For small residential applications, a hose and spigot, with a battery operated controller, can suffice. Maintenance is similar to typical garden maintenance, but with much less weed pressure as LiveRoof engineered soil is not full of weed seeds like typical topsoil.

How it's Grown. At times the Maxx System is filled with soil and delivered with no plants—so the property owner can

plant it with edibles. When used for perennial plants, it is almost always plug-planted, grown (at the nursery) until well rooted, then delivered to the job site. It is important to provide plenty of advance notice if any uncommon species or quantities are needed. Grow time ranges from 8 to 16 weeks depending upon climate and plant selections.

Comparative Cost & Installation. The Maxx System is more costly than the other LiveRoof systems because of the soil depth, smaller footprint, plant types, and relatively longer installation time. But, for its intended purpose, it is often a very economical alternative.

University

Maxx System

FOR FOOD GROWING

The Maxx System is a special LiveRoof system for small scale garden roofs with limited access—or smaller portions of conventional green roofs where pockets of additional soil depth are needed to support unique accent plants.

Public Transit Operations Center

Maxx System

WITH GRASSES

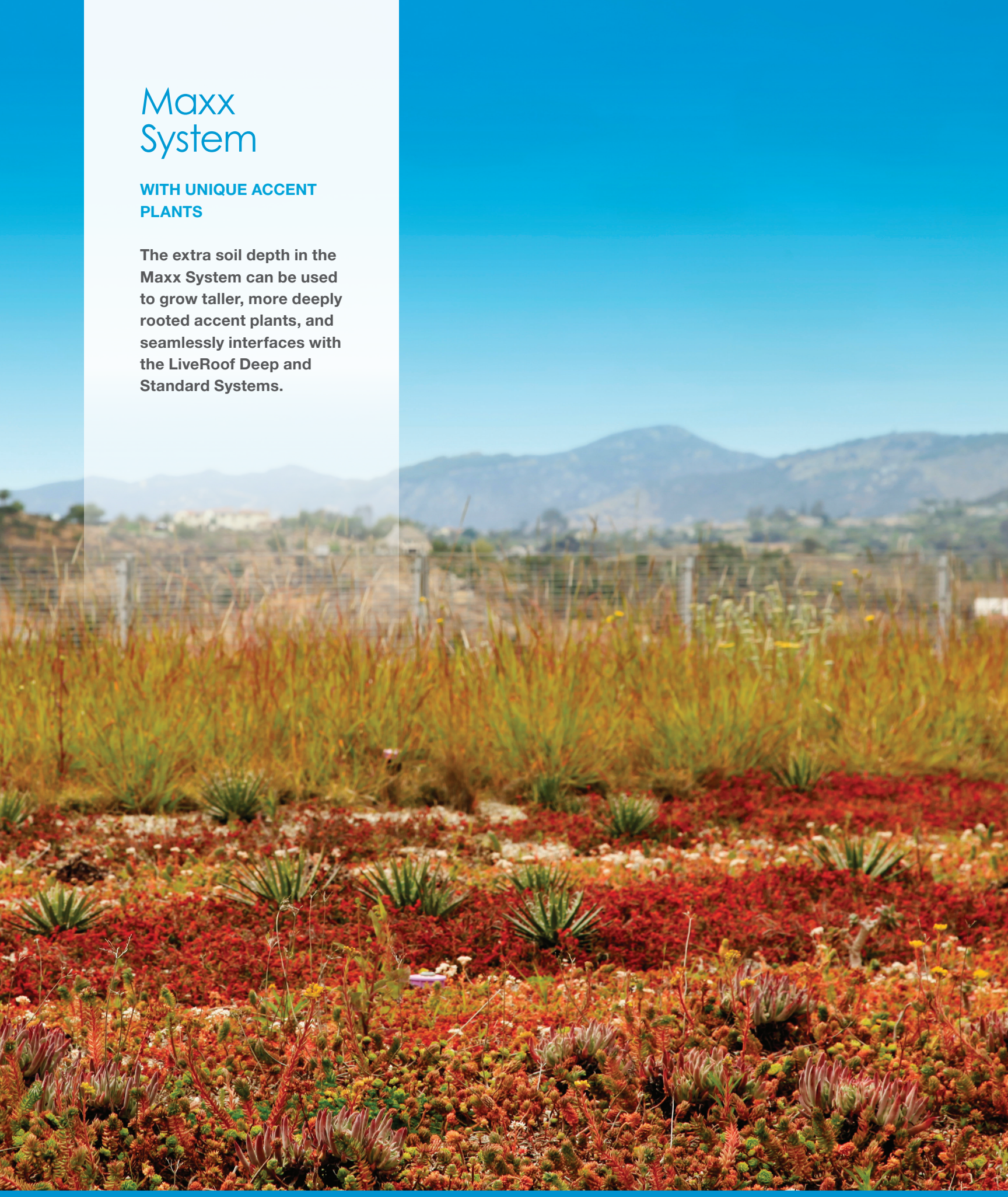
These grasses and grass-like plants grow nicely in the Maxx system in this California LiveRoof installation.

Office Building Amenity Roof

Maxx System

WITH UNIQUE ACCENT PLANTS

The extra soil depth in the Maxx System can be used to grow taller, more deeply rooted accent plants, and seamlessly interfaces with the LiveRoof Deep and Standard Systems.



LiveRoof® Roof Stone™ Pavers

RoofStone pavers follow the roof contour and integrate seamlessly with the Standard, Deep, and Maxx Systems for effective walkway and patio designs. RoofStone eliminates the need for pedestals and edging and installs much faster. This makes it a more cost effective option than conventional patio pavers for surfaces that don't need to be dead level.

New Improved Traction Surface

Roof Stone™ Saves Money!

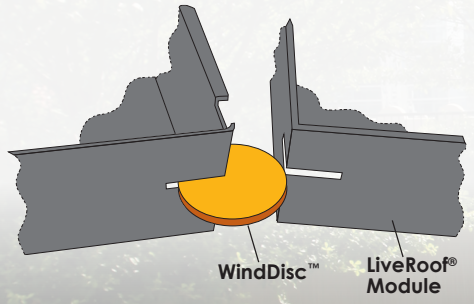
	RoofStone paver with integrated pedestal	Traditional Pedestal Paver
Paver cost	$ 15.45 per sf	$ 6.95 per sf
Pedestal	not needed	$ 5.50 per sf
Edging	not needed	$ 1.50 per sf
Installation Labor	$ .85 per sf	$ 5.75 per sf
***Overall Cost**	**$ 16.30 per sf**	**$ 19.70 per sf**

*Prices are approximate delivered, at time of printing. (in U.S. Dollars)

WindDisc™

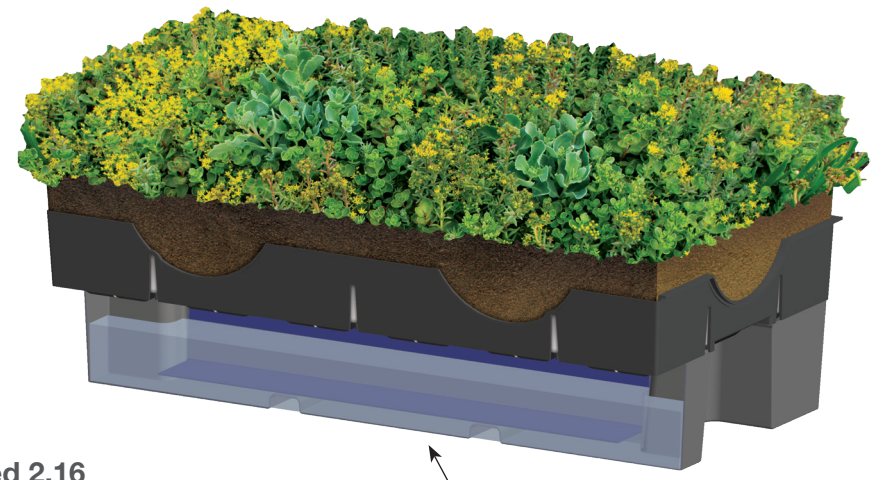
ACCESSORY TO ALL LIVE ROOF SYSTEMS

For wind exposed high rise applications, the patent-pending WindDisc® feature is a simple and fast way to fasten the LiveRoof modules together for improved wind uplift resistance. WindDisc has tested effective at uplift pressures exceeding 200 psf (under certified laboratory conditions), and can be applied to all LiveRoof systems.



RoofBlue RETAIN Blue Green Solution

RoofBlue RETAIN is a true "Cradle-to-Cradle" solution for **enhanced storm water capture**. **It captures and "RETAINS" storm-water then…. after the storm event it transfers stormwater upward to the plant-roots, for plant growth and transpiration (to the atmosphere).**



Holds an added 1.35 gallons per sq ft (2.16 inches of rain)—in addition to the water held by the soil.

ELEGANTLY SIMPLE AND EFFECTIVE

RoofBlue RETAIN follows years of development and testing and is supported by university research.

- **Can hold 1.35 gallons per sq ft (an added 2.16 inches of rain)—in addition to the water held by the soil.**
- **Can increase storm water retention 42% compared to LiveRoof Standard.**
- **Can increase storm water retention 55% compared to LiveRoof Lite.**
- **Outperformed rockwool (2 inches rockwool + 3 inches of soil).**
- **Improves irrigation efficiency, especially drip irrigation.**
- **Lower cost per gallon "of water-retained", than other options.**

SUSTAINABLE RoofBlue RETAIN is made from recycled material and is recyclable. It could be repurposed 100 years from now.

For more information please contact any of our dedicated LiveRoof Growers….We are here to help.

***Patent Pending**

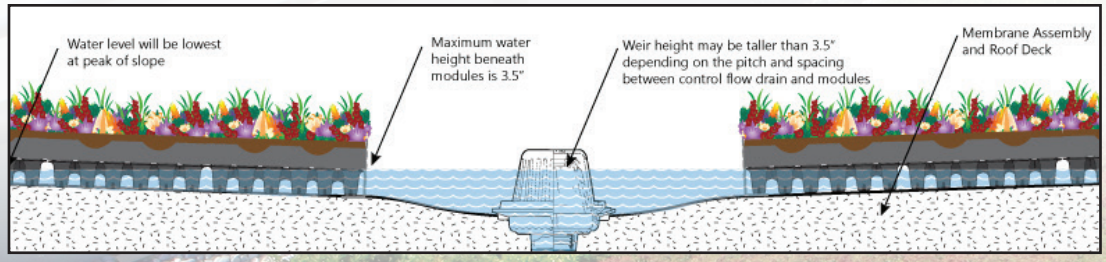
LiveRoof® BRAND System Accessories

RoofBlue® DETAIN

For enhanced storm water management.

The patented LiveRoof RoofBlue® DETAIN base is engineered to provide temporary water detention beneath the LiveRoof system. When used with a control flow drain system, RoofBlue DETAIN expands the usefulness of the green roof system to maximize rooftop storm water management capability. This may greatly reduce the need for other onsite storm water management tools, such as cisterns, detention ponds, or underground storage tanks.

For more details, visit liveroof.com/roofblue or call LiveRoof Global, LLC at 800-875-1392.



LiveRoof® BRAND
Hybrid Green Roof System

Designer's Checklist

System Specifications and Drawings

_____ Specifications are very fast and easily developed using Specwriter on LiveRoof.com in A & E section.

_____ Choose sole spec. option to protect design integrity.

_____ Use performance spec. for public jobs if sole spec is not allowed.

_____ Be sure to overlay the green roof design over other rooftop design elements (such as lighting, electrical conduits, drains, mechanicals, etc.) to ensure compatibility.

_____ Overlay design with 1' x 2' grid pattern to aid installer in take offs and budget development (1' x 1' for LiveRoof Maxx modules.)

Plant Material Specifications and Drawings

_____ Plant material is integral to the functional, visual, and maintenance characteristics of the LiveRoof. Choose wisely and consult with your local LiveRoof grower for advice on pairing the plants with the particular rooftop environment. Ask your local grower to assist with and to review your plant list so as to make the best choices based upon such variables as; colors and patterns, sun and shade exposure, reflected light, strong winds or dead air, building height, climate, soil depth, irrigation, desired winter colors, etc.

_____ Call out the plant selections, regardless of the system (X-Lite, Lite, Standard, Deep, or Maxx), specify the particular "base" plant material, and "accent" plants. Craft the plant selections in regard to light exposure and account for the specific exposures if there are multiple roofs. If there are accent plants in the mix, specify the density and position of the plants with a visual diagram so that bidders know what is required and the grower knows how to plant it.

Irrigation

_____ If a built in irrigation system is part of the design (a good idea for many installations; and essential in California and other states with warm/hot/dry climates), specify a multi-stream, rotary nozzle overhead irrigation system where code-compliant (this type of irrigation is the most water wise). However when designed properly, drip irrigation systems perform well with the LiveRoof system as well (and can be further optimized, to conserve water, when used in conjunction with the LiveRoof RoofBlue Retain system).

_____ If no irrigation, be sure to provide sufficient spigots so that a 50' hose can easily be manipulated to reach the various areas of the green roof.

Bidding Contractors

_____ Consult your local LiveRoof grower for referrals of "Certified" installers.

_____ Require contractors to adhere to design and specifications. Disallow substitutions.

System Protection and Worker Safety

_____ Specify and follow all safety, code, wind uplift, structural loading, and other important considerations. Be sure to have these items developed or reviewed by a structural engineer if needed.

Water-tightness

_____ Require flood testing or electronic leak detection to insure membrane integrity prior to placement of green roof.

Problem Areas - Avoid using plant material in the following locations:

_____ Underneath roof lines unless there is built in irrigation.

_____ Within 2 feet of south or west facing walls, unless irrigated weekly (during growing season), as reflected light will cause excessive loss of soil moisture. Likewise for windows that are at the same level as the green roof. And, if the windows have a mirror finish, we recommend not planting within 6 feet of the windows.

_____ Within 10 feet of mirror-finished glass cladding.

_____ Underneath downspouts and rooftop overhangs which cause soil erosion and plant loss.

_____ In corners where snow tends to drift during winter.

_____ In shady areas, those that get less than 3 hours of direct sunlight per day—too shady for sedums. Such locations require the Deep system and shade tolerant perennials such as Hosta, Epimedium, etc.

_____ Locations with constricted air movement.

_____ Areas where there is reflected light from white membrane, glass and skylights, unless there is a built-in irrigation system and access to water at least once per week.

_____ Areas where there is excessive heat below roof deck, such as from steam or hot water pipes. Use pavers or stone ballast in such areas.

_____ Any area where water pools on the roof.

_____ Within 10 feet of the leeward side of wind screens unless they extend to the ground. If there is a gap, the wind will blow under it, accelerate, and dry out the plants.

_____ Under landscape lighting that is close enough to plant material to throw heat onto the plant material.

Design for Longevity

_____Cover up all membrane so that it is protected from sunlight and will wear at a similar pace as the membrane under the green roof. It is suggested that flashing cover the membrane on the parapet and extend to 2 or 3 inches above the roof deck. Similarly, membrane around drains should be covered with a RoofEdge drainbox with lid or 2" to 4" of round river rock to shelter it from sun.

_____ The membrane surrounding drain boxes should be covered with slip sheet material as well as underneath the green roof system.

Edging

_____Make it clear on the drawings where the LiveRoof RoofEdge® needs to be used for system integrity and enhanced wind uplift resistance. For example, around drains, mechanical units, next to stone ballast or traditional paver pedestals, etc. If the plant material runs from parapet to parapet, then RoofEdge is not required along parapet.

Designer's Checklist, *continued*

Traffic Areas

_____ RoofStone paver is integrated and recommended to be used with the LiveRoof Standard and Deep systems. It may be used for pathways and patios and follows the contour of the roof.

_____ Provide for a landing area of RoofStone brand pavers so that visitors and maintenance workers may avoid trampling plants. A 10' x 10' area is suggested immediately bordering the roof access point.

_____ If the roof serves as a means of egress during the winter months, specify that no de-icing chemical or salt be used. Instead specify that cat litter or sand be used for traction. Alternatively, an appropriate heat cable might be installed under the paver.

_____ If windows will be washed from the roof, develop a maintenance strip using RoofStone pavers or gravel ballast so that plants are not destroyed by foot traffic.

RoofStone Pavers

_____ LiveRoof RoofStone pavers follow the roof contour and are compatible with Standard and Deep Systems (double base of paver with 6 in. Deep System), and require no pedestals or edging between paver and plant materials. However, if they are used in a perimeter application, they should be surrounded with edging to shield their bases from sunlight.

Installation

_____ Require installation contractor to flood test roof, or EFVM (Electronic Field Vector Map) and verify it is watertight, prior to green roof installation.

_____ Require that any low areas with ponding water be corrected prior to LiveRoof installation.

_____ Require adherence to LiveRoof installation protocol.

_____ Require installation contractor and general contractor to prevent foot traffic, trampling, and equipment storage upon LiveRoof plants.

_____ Require that irrigation protocol (how often/how much) be approved by local LiveRoof grower.

Maintenance

_____**Specify who will maintain the LiveRoof immediately after installation.**

_____Require adherence to LiveRoof specified maintenance protocol beginning at the time of installation. **If one year of maintenance is required as part of the installation package, state so definitively.**

_____Provide sufficient tie off anchors for future maintenance if roof design or OSHA policy requires such safety measures for maintenance workers.

_____Provide for easy access by maintenance workers. Remember, maintenance personnel will at times need to access the roof with equipment, fertilizer, hoses, possibly even a lawn mower.

_____Specify that maintenance contractor is to subscribe to free LiveRoof monthly maintenance newsletter.

_____Specify that maintenance contractor and owner facilities' staff to receive maintenance training by LiveRoof rep. This is requred for warranty registration.

Canopy Roofs

_____ With flat canopy roofs, specify the installation of heat cables in the drains and downspouts to prevent wintertime ice dams.

_____ Specify NO HEAT MELT in the concrete under North Facing canopy roof—unless the canopy has 6 or more inches of closed cell foam under the LiveRoof system (in the roof deck). In such applications, too much heat can be trapped, to the detriment of the plants' wintertime survival. The closed cell foam is required to compensate.

High Rise Applications

_____ WindDisc for Enhanced Wind Resistance see WindDisc in A & E section of LiveRoof.com. Contact LiveRoof, LLC for wind uplift laboratory data.

_____ Vegetation for High Rise Applications: Specify special plant mix for high rise applications. Consult your LiveRoof grower for the most wind/cold resistant varieties that can knit together and resist wind erosion during all 4 seasons.

_____ Mandatory Irrigation System: Spray rotor irrigation system is considered mandatory as a key management tool to maintaining lush, full vegetation, for wind erosion resistance.

_____ Maintenance Standard: Specify who will care for the roof and prescribe a standard of 100 % coverage, weed free condition. This is important to resisting wind erosion.

Structural Integrity (Sloping Roofs, Wind, Load Capacity)

_____ If it is a sloping roof, account for downward force against the parapet or other elements on or surrounding the roof. Be sure that the system is properly braced and stabilized, in accord with the specifications and methods shown in the A & E section of the LiveRoof catalog and website, and other methods as deemed appropriate by a qualified engineer.

_____ If the green roof is in a location that is wind challenged, be certain to account for this in the size, shape, and field location of the green roof including perhaps the LiveRoof WindDisc accessory, the parapet size and design, and the use of a built in place irrigation system to maintain thick vegetative cover.

_____ Account for the weight of the green roof, including snow and other elements, in the structural design of the building.

_____ Within the specification, quantify the load limits of the roof so that the installers may avoid placing materials on the roof that might exceed weight limits during the installation process.

LiveRoof® BRAND

Dedicated to Your Success

LiveRoof, LLC
A Subsidiary of Hortech, Inc.

P.O. Box 533
Spring Lake, MI 49456
(800) 875-1392

Your Success is our Success.

LiveRoof has the experience that comes from completing thousands of green roof projects. For this reason, there is no need for you to make mistakes that have already been made. And, there is no reason for you to be less successful than the most successful projects. We are here to share our experiences so that your project is optimally successful.