



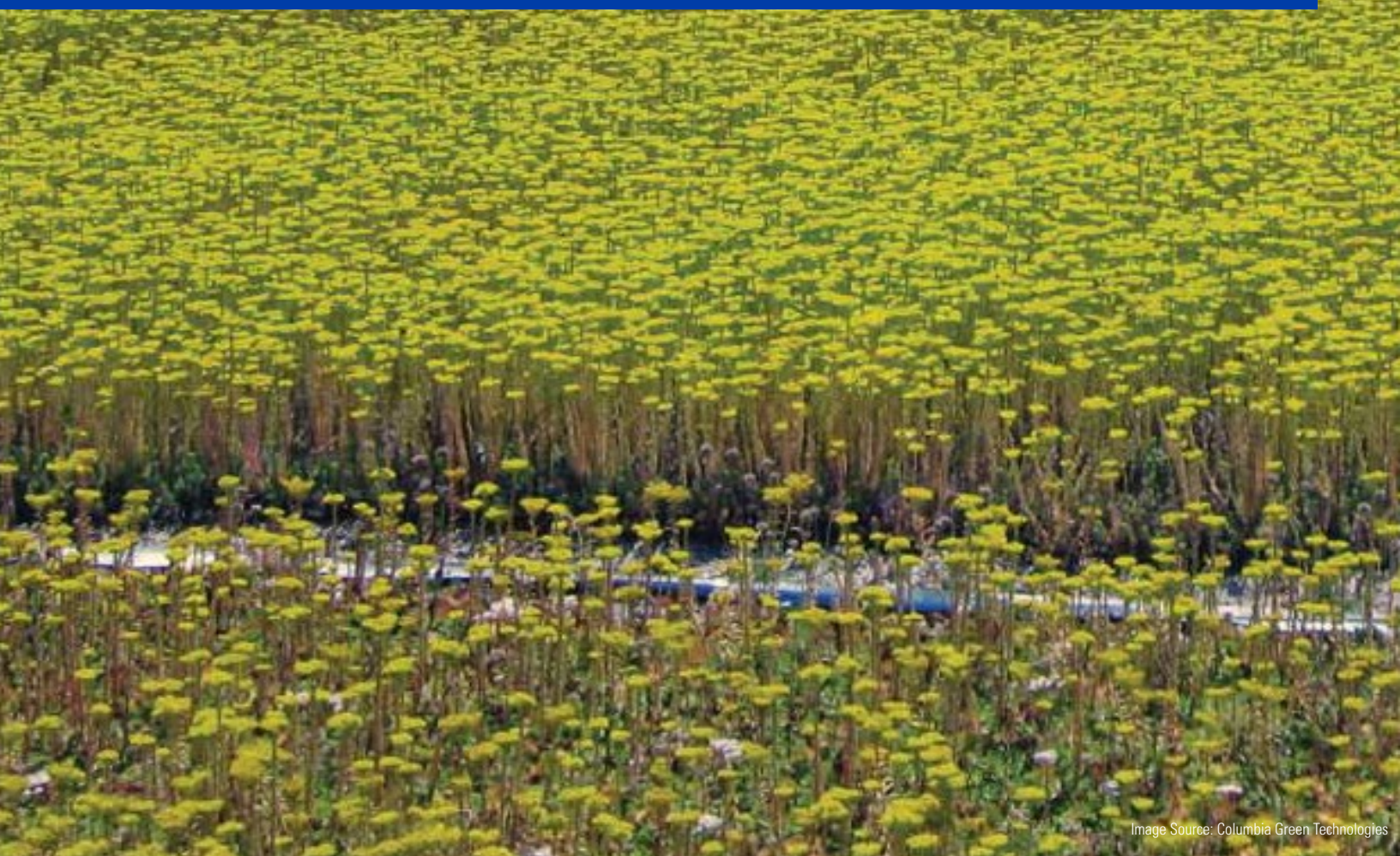
GREEN ROOFING

JM REFERENCE GUIDE



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WHAT IS A **GREEN ROOF?**

A green roof is trays and layered green roof systems that incorporate vegetation and engineered growing systems installed above the roof membrane. Designed to work in harmony with the building, green roofs help manage stormwater, moderate rooftop temperatures, protect the underlying roof system, and bring nature back into dense urban environments.



Image Source: Columbia Green Technologies

WHY A **GREEN ROOF?**

A strategic investment for sustainable commercial development. Green roofing offers commercial developers a way to meet environmental goals or code requirements while enhancing asset value. In certain states and cities, a stormwater management program is required when constructing a new building or incorporating major renovations. This is due to limited “green space” given all the “hardscapes” like roads, sidewalks, parking lots, etc. Green roofing is a solution. Based upon the system, green roofs offer stormwater retention and reuse, moderating the flow of stormwater entering the sewer system.

GREEN ROOF TYPES

There are three general categories of green roof systems grouped by soil depth, plant variety, and the presence of hardscaping.

Soil in these systems can be installed either in trays or in layers.

TRAY SYSTEM

- Characteristics: modular plastic or metal tray systems with media growth of 3 inches to 8 inches. Typically, the vegetation is pre-grown and delivered to the jobsite.



LAYERED SYSTEM

- Multi-component system with drainage and protection layer(s) over the primary waterproofing membrane.

THREE CATEGORIES OF GREEN ROOF SYSTEMS

EXTENSIVE

- Characteristics: Lightweight design with a shallow substrate layer (typically 3-5 inches).
- Vegetation: Ideal for drought-tolerant, low-growing plants such as mosses, sedums, and grasses.
- Maintenance: Minimal upkeep.
- Applications: Suitable for existing building retrofits due to low structural load requirements.

SEMI-INTENSIVE

- Characteristics: Moderate substrate depth (6–12 inches), allowing for a wider variety of plant species.
- Vegetation: Supports grasses, herbs, and small shrubs.
- Maintenance: Requires regular irrigation, fertilization, and pruning.
- Applications: Expanded design options based on the variety of growing media available.

INTENSIVE/AMENITY

- Characteristics: Deep substrate layers (12 inches or more), mimicking traditional landscaping.
- Vegetation: Capable of supporting trees, large shrubs, and full-scale gardens.
- Maintenance: High maintenance including irrigation systems, and plant care.
- Applications: Often used in urban parks or rooftop gardens; it requires significant structural support and planning.

BLUE ROOF SYSTEMS

Low-slope blue roofing systems are intended to temporarily retain or slow the release of stormwater from the roof surface. Blue roof systems reduce the risk of urban flooding and can ease the burden on municipal stormwater infrastructure. Green roof systems can act to retain stormwater passively; however, blue roof systems typically incorporate design elements such as weirs, absorptive media and drain restrictors for passive systems and active systems utilize monitoring and flow control valves to moderate drainage rates.

Blue roof systems often incorporate vegetative and solar components.

Performance of roof drainage retention or blue roof systems is the responsibility of the system designer based on their analysis of the building's structure, drainage capacity and design intention. These complicated systems require specialized design and input from a variety of stakeholders including design, engineering and trade specialists.

ROOF SYSTEMS AND GREEN ROOFING CONSIDERATIONS

Before installing green roofing there are key considerations to keep in mind. A few examples are energy efficiency, aesthetics, and stormwater management.

Dead Load Increase

- Growing Medium: Media or engineered substrates typically add 10-55 lb./ft² depending on depth and saturation.

(<https://columbia-green.com/wp-content/uploads/2015/12/CGT-Green-Roof-Weights.pdf>)

- Drainage and Retention Layers can add further static weight.

Live Load Considerations

- Maintenance Access: Roofs may need to support personnel and equipment.
- Consideration must be given to the saturated vs. dry weight of the installed media.
- Snow Load Interaction: Vegetation can alter snow accumulation patterns, potentially increasing localized loads.

Load Distribution

- Green roofs often distribute loads uniformly; however, the incorporation of hardscape elements can create point loads so structural members (e.g., joists, beams) must be sized to accommodate the distribution of weight throughout the project area.
- Slope Considerations: On sloped roofs, lateral forces from soil movement and water runoff may require added attachment or terracing systems.

Code Compliance

- Green roof installations must follow relevant building codes and standards.
- Designers should be attentive to fire department access and planting limitations under the purview of the local Fire Marshal.
- Local jurisdictions may have additional requirements for green roof systems.
- JM roof systems require ¼" slope as defined in the International Building Code (IBC).

Maintenance and Inspection

- Access to drainage locations is required for routine inspection and debris removal to prevent clogging.
- Care should be exercised to avoid limiting access to other rooftop components that require routine maintenance.

Seasonal and Geographic Factors

- April to October is the typical installation window for a green roof system.
- Low slope green roofing systems are influenced significantly by seasonal and geographic factors, which affect their design, performance, and maintenance.

Structural Load Consideration

Green roofs introduce added dead and live loads that must be accounted for in structural design.

NEW ROOF AND EXISTING APPLICATION

Requirements of Single Ply and SBS Systems:

Single Ply Roofing System Requirements by Media Depth

	Extensive		Semi-Intensive		Intensive/Amenity
	Tray	Layered	Tray	Layered	Layered
Media Depth (typical)	3" to 5"		6" to 12"		12"+
Construction	New/Re-Roof				
Deck	Steel/Concrete				Concrete
Insulation	JM ENRGY 3® 0.5% 12"+				
Cover Board	Not required unless guarantee requirement		Required		
Membrane	≥ 60 mil				
EPDM	In-Lap Seam Tape		In-Lap Seam Tape and Covered		
PVC	Heat Welded Seams				
TPO	Heat Welded Seams				
Membrane Attachment	Adhered				
Leak Detection Prior to Install	Contact a JM Field Technical Representative prior to installing any overburden. Roof is to be 100% probed with a leak detection test conducted. All punch list items must be completed prior to loading or installation of the overburden.				

SBS Ply Roofing System Requirements by Media Depth

	Extensive		Semi-Intensive		Intensive/Amenity
	Tray	Layered	Tray	Layered	Layered
Media Depth (typical)	3" to 5"		6" to 12"		12"+
Construction	New/Re-Roof				
Deck	Steel/Concrete				Concrete
Insulation	JM ENRGY 3® 0.5% 12"+				
Cover Board	As dictated by the system requirement and/or if system exceeds 25 psf. Protector® HD for cold applications and DynaBoard or Gypsum for torched.				
SBS	2 ply minimum. Torched or cold.				
Membrane Attachment	Torched or cold application adhesive. Base ply can be self-adhered.				
Leak Detection Prior to Install	Contact a JM Field Technical Representative prior to installing any overburden. Roof is to be 100% probed with a leak detection test conducted. All punch list items must be completed prior to loading or installation of the overburden.				
Flashing Requirements	2 ply minimum. Hot or cold only. PMMA or PermaFlash® is required for all penetrations.				

Note: Ballasted systems are excluded from this guide.
Guarantee requirements supersede all green roofing requirements above.

Green System Requirements - Single Ply and SBS

	Extensive		Semi-Intensive		Intensive/Amenity
	Tray	Layered	Tray	Layered	Layered
Media Depth (typical)	3" to 5"		6" to 12"		12"+
Root Barrier	Required				
Drainage Mat	Optional	Required	Optional	Required	
Slip Sheet	Optional				Required

For new construction or re-roof projects to receive a green roof system, JM recommends that the roofing system incorporates an adhered high density cover board (minimum 100 psi compressive strength) and an adhered membrane. This configuration will distribute loading and minimize long term point loading impacts on the waterproofing membrane.

Drainage Design

- Slope Optimization: Ensure adequate slope directs water toward drains.
- Drainage Layers: Include a drainage mat or layer to enhance and ensure an avenue for water flow.
- Drains, Scuppers & Gutters: Sized appropriately to meet plumbing code requirements for peak flow rates. Consideration should be taken to isolate organic build-up around these drainage outlets.

Transition Details

- Edge Flashing: Secure and terminate transitions between the green roof and conventional roof areas.
- Parapet Integration: Ensure base flashings are at minimum 8" above the finished overburden surface.
- Review local code requirements for finished wall height compliance.
- Access Paths: Pavers or walkways for maintenance access without damaging vegetation.
- Inspection Points: Easy access to drains, scuppers, and rooftop infrastructure for routine checks.
- Irrigation System: Depending on climate and plant selection. Imperative to plant sustainability and to avoid fire risk.
- Maintenance Plan: Regular weeding, pruning, and inspection schedule. Fertilization options should come from the green roofing provider to ensure compatibility with the system components. Monitor drainage paths for any form of debris buildup.

Sample Checklist for Planning

- ☐ Structural assessment complete
- ☐ Design professionals retained
- ☐ Drainage and slope evaluated
- ☐ System type selected
- ☐ Guarantee requirements reviewed
- ☐ Installation scheduled within seasonal window
- ☐ Maintenance plan established

GUARANTEE IMPLICATIONS (JM PEAK ADVANTAGE®)

New Roof Applications offer the advantage of potentially integrating green roofing systems from the ground up. This allows for seamless coordination between structural design, waterproofing system selection, drainage, and vegetation layers.

If roof system modifications are implemented within 24 months of the start date listed on the JM Guarantee, it is recommended the original installing JM Peak Advantage® contractor listed on the JM Guarantee be retained to complete the roofing scope of work.

JM requires that all proposed roof system alterations be communicated to JM for review prior to project start.

Terms and conditions of your specific guarantee should be reviewed for a full understanding of your responsibilities. JM requires that all proposed roof system alterations be communicated to JM for review prior to project start. All changes to the roofing system must be approved by JM, utilize JM products, and be installed in accordance with our details and specifications by an approved JM Peak Advantage® contractor.

While JM may allow a certain product to be installed on the roof system, only JM branded or approved products are covered by the guarantee. When reviewing proposed alterations, JM evaluates the proposed layout, products and details to ensure that there is not a significant issue with the proposed changes as it relates solely to the continuing guarantee coverage. Acceptance by JM is not an endorsement or warranty of the design or products being used. For additional information, please see the [Green Roof Overburden Additions form](#).

- The JM Guarantee does not cover any leaks, changes in appearance, damage or loss of performance in the roofing system resulting from the installation, operation or presence of a green roofing system on the roofing system.
- JM is not responsible for any claims related to the JM Guarantee that are attributable, either in whole or in part, to the installation, operation and/or presence of a green roofing system.
- In the absence of a JM Limited Overburden Rider on the guarantee, the removal of any part of the green roofing system to complete repairs, whether covered by the JM Guarantee or not, shall be the owner's responsibility and is not covered under the terms and conditions therein.
- JM does not approve the suitability, installation or performance of any green roofing system or components other than those marketed or branded by JM unless otherwise listed under the terms and conditions therein.
- Specifically, Johns Manville disclaims any liability for the vegetative/green/amenity system's design, installation, wind uplift performance, dead load on the structure, or any impact to the performance of the building's roof, mechanical, electrical, or plumbing systems.

JM PROCESS FOR GREEN ROOFING

Before installing a green roof on a JM-guaranteed system:

Complete and submit the [Green Roof Overburden Additions form](#) supplying the following required information:

- Green roof installer.
- Green roof component manufacturer.
- Green roof type.
- Detailed roof plan showing scope of work and location(s) on roof.
 - Roof plan is to show the full extent of the green roof over the roof's surface including drainage, maintenance paths and access points.
- Installation and/or Flashing Details.
- Provide green roof system, flashing, termination, drainage and all other applicable details.
- JM guarantee or tracking number.
- Square footage of green roof system.
- Green Roof Overburden Waiver signed by Building Owner or documented representative.

Guarantee requirements supersede all green roofing requirements.



Image Source: Adobe Stock AI



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Guarantee and Technical Services

For questions regarding guarantees
and technical services:

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