

**Burlington Planning Commission
Ordinance Committee**

149 Church Street
Burlington, VT 05401
Telephone: (802) 865-7188
Fax: (802) 865-7195
www.burlingtonvt.gov/pz

Alexander Friend
Bruce Baker
Andy Montrol
Wayne Senville
Phil Hammerslough



Burlington Planning Commission

Ordinance Committee

Thursday, March 9, 2017 @ 5:15 PM

Planning & Zoning Conference Room, Ground Floor, City Hall

SPECIAL MEETING AGENDA

1. Green roofs & lot coverage
Continued consideration of amendment pertaining to lot coverage credits for green roofs
2. Adjournment (6:15)

Next Meeting – April 6, 2017

This agenda is available in alternative media forms for people with disabilities. Individuals with disabilities who require assistance or special arrangements to participate in programs and activities of the Dept. of Planning and Zoning are encouraged to contact the Department at least 72 hours in advance so that proper accommodations can be arranged.

Department of Planning and Zoning

149 Church Street
Burlington, VT 05401
Telephone: (802) 865-7188
(802) 865-7195 (FAX)
(802) 865-7142 (TTY)

David White, AICP, Director
Meagan Tuttle, AICP, Comprehensive Planner
Jay Appleton, GIS Manager
Scott Gustin, AICP, CFM, Principal Planner
Mary O'Neil, AICP, Principal Planner
Ryan Morrison, CFM, Associate Planner
Anita Wade, Zoning Clerk
vacant, Department Secretary



TO: Planning Commission Ordinance Committee
FROM: Scott Gustin
DATE: March 2, 2017
RE: Green Roofs & Lot Coverage

At its January 10, 2017 meeting, the Planning Commission discussed the green roof zoning amendment forwarded by the Ordinance Committee. That amendment provided 100% lot coverage credit for fully at-grade green roofs, no lot coverage credit for fully above-grade green roofs, and partial lot coverage credit for partially at-grade green roofs. There was consensus as to the treatment of fully at- or above-grade green roofs. There was significant difference of opinion as to the treatment of partially at-grade green roofs. As forwarded by the Ordinance Committee, partially at-grade green roofs would receive lot coverage credit for at-grade portions of the green roof and none for above-grade portions. There was concern as to the variability of making such calculations, particularly in light of myriad iterations of partially at-grade green roofs. There was also a strong sense that partially at-grade green roofs should receive some consistent measure of incentive so long as they are accessible. The discussion also cited the need to define "green roof." The Planning Commission sent the amendment back to Ordinance Committee for further discussion.

As part of its previous discussion of the amendment, the Ordinance Committee considered green roof guidelines from other municipalities in the United States. Examples of lot coverage credit for green roofs abounded, and almost all of them provided a set credit (i.e. 50%, 75%, etc. lot coverage credit). This set credit standard is consistent with the green roof lot coverage proposal by the UVM Medical Center that imitated this amendment.

The green roof lot coverage credit as revised by staff below incorporates the following:

- A set lot coverage credit
- Recognizes extensive vs. intensive green roofs
- Is contingent on accessibility
- Defines "green roof"

Proposed Ordinance Language:

Sec. 5.2.3, Lot Coverage Requirements

(b) Exceptions to Lot Coverage

(1)-(8) as written.

- (9) For the purposes of lot coverage calculations, at-grade green roofs shall be counted as open space, and above-grade green roofs shall be counted as lot coverage. Partially at-grade green roofs shall be counted as lot coverage unless open and accessible to the public. Partially at-grade green roofs open and accessible to the public will be counted as lot coverage as follows:

- i. Intensive green roofs will be counted at 50% lot coverage of their total roof area.
- ii. Extensive green roofs will be counted at 75% lot coverage of their total roof area.
- iii. Walkways, equipment, and other un-vegetated areas within the green roof shall not receive lot coverage credit.
- iv. These lot coverage exceptions are contingent on continued maintenance and functionality of the green roof.

ARTICLE 13: DEFINITIONS

Green roof: A contained green space planted over a synthetic waterproofed membrane created by adding layers of growing medium and plants on top of a traditional roofing system which also includes a layer for drainage. The green space on the roof may partially or completely cover the traditional roofing system. There are two types of green roofs: extensive and intensive. Extensive green roofs generally have a soil depth of less than six inches, require little maintenance, and are lightweight. Intensive green roofs typically have a soil depth of more than six inches, require more frequent maintenance, and are heavier than extensive green roofs. In order to be classified as an intensive green roof for lot coverage credit, the green roof must have a minimum soil depth of six inches.

Some questions remain as to accessibility. Accessible by whom? As drafted above, accessibility is for the general public. Can it be accessible exclusively to the property owner? The property owner and tenants only? If it needs to be accessible to the general public, is such amendment appropriate in the residential zoning districts?

For reference, information as compiled by the American Planning Association planning advisory service is below:

Local ordinances: lot coverage calculations for green roofs

Asheville (North Carolina), City. 2016. *Code of Ordinances*. Chapter 7: Development.

Article XI: Development and Design Standards. Section 7-11-4 Open space standards.

- Green space standard: green roofs may be used for up to 100% of open space standard, at discretion of city.
- *Land used for stormwater retention, provided such land is natural in appearance and is not separately fenced, may be used for up to 50 percent of the required open space; green roofs are eligible to be counted as open space under this provision. Additionally, land used for stormwater retention, provided such land is natural in appearance and is not separately fenced, that is developed using best management practices (e.g., constructed wetlands, rain gardens, green roofs or similar features), and either exceeds the required amount of retention or treats off-site stormwater may be used for up to 100 percent of the required open space at the discretion of the planning and development director after consultation with the city engineer.*

Austin (Texas), City of. 2016. *Land Development Code*. Title 25: Land Development.

Chapter 25-2: Zoning. Subchapter E: Design Standards and Mixed Use. Article 2: Site Development Standards. Section 2.7: Private Common Open Space and Pedestrian. Section 2.7.3: Standards. Part D: Design Criteria. See, also:

Environmental Criteria Manual. ECM Appendix W: Vegetated ("Green") Roof Performance Standards.

- Allows for up to 50% of required private common open space can be located on green roof. Performance standards, in Appendix W.
- *Up to 50 percent of the required private common open space may be located on a roof, balcony, or other area above ground level if at least 50 percent of the open space above ground level is designed as a Vegetated or Green Roof. For the purpose of this section, a Vegetated or Green Roof is an assembly or system, over an occupied space, that supports an area of planted bed(s), built up on a waterproofed surface at any level that is contained separately from the natural ground by a human-made structure. A Vegetated or Green Roof must comply with the performance standards adopted by rule.*

Aventura (Florida), City of. 2016. Code of Ordinances. Chapter 14: Buildings and Building Regulations. Article VI: Green Building Program. Section 14-115: Incentives and bonuses; agreement and bond requirements.

- Green roof bonuses given in context of LEED standards.
- Lot coverage bonus provided that a green roof and/or green rooftop amenities are provided and maintained for the common benefit of building occupants; and; that increased Florida-Friendly tree canopy and Florida-Friendly plantings designed to calm the heat island effect are located on site, all in an amount equal to the requested increased lot coverage, using the conditional use approval standards in section 31-73 of the City Code rather than the variance approval standards in section 31-76 of the City Code.

Bothell (Washington), City of. 2016. Municipal Code. Title 12: Zoning. Chapter 12.52: Fitzgerald/35th Avenue SE Subarea Regulations. Section 12.52.040: Preservation of the hydrologic cycle within the North Creek Fish and Wildlife Critical Habitat Protection Area (NCFWCHPA). Part D: Supplemental Low Impact Storm Drainage Standards. Subpart 2(d): Vegetated Roofs. See also, Bothell, City of. 2015. Design and Construction Standards and Specifications. Chapter 7: Low Impact Development Supplement. Topic 2.6 LID BMP #4: Vegetated Roofs.

- Vegetated roofs are encouraged, and credits are given on an ad hoc basis.
- Standards are per a regional/state plan would need similar standards to replicate this system.
- Vegetated roof credit is "encouraged," but credit on "case-per-case basis."

Brooksville (Florida), City of. 2014. Code of Ordinances. Subpart B: Land Development Code. Article IV: General Requirements and Supplemental Regulations. Section 4-8.36: Green Roof. Article XI: Definitions. Part 11-1: Contents.

- Includes broad standards for roof (no irrigation with potable water, etc.). Defines "intensive" versus "extensive" green roofs.
- Green roof. *A contained green space (also known as an eco-roof, living or vegetated roof) planted over a synthetic waterproofed membrane created by adding layers of growing medium and plants on top of a traditional roofing system which also includes a layer for*

drainage. The green space on the roof may partially or completely cover the traditional roofing system. There are two types of green roofs: extensive and intensive. Extensive green roofs generally have a soil depth of less than six inches, require little maintenance, and are lightweight. Intensive green roofs typically have a soil depth of more than six inches, require more frequent maintenance, and are heavier than extensive green roofs. In order to be classified as an intensive green roof for open space credit, the green roof must have a minimum soil depth of six inches.

- *Part (f) The area taken up by the portion of a roof which is comprised of a green roof shall constitute open space for a maximum credit of 50 percent for extensive green roofs and a maximum credit of 75 percent for intensive green roofs towards the open space required on site.*

Chico (California), City of. 2016. *Municipal Code*. Title 15: Water and Sewers. Chapter 15.50: Storm Water Management and Discharge Controls. Section 15.50.08: Post construction storm water management.

- Square footage calculation, with green roof
- One of the mitigation measures is a green roof. Site Design Measures: *All projects that create and/or replace (including projects with no net increase in impervious footprint) between 2,500 square feet and 5,000 square feet of impervious surface, including detached single family homes that create and/or replace 2,500 square feet or more of impervious surface and are not part of a larger plan of development are required to implement one or more of the following site design measures to reduce project site runoff.*
- One of the measures allowed for impervious mitigation requirement: Green roof, a vegetated, open-channel management practice designed specifically to treat and attenuate storm water runoff;

Doral (Florida), City of. 2016. *Code of Ordinances*. Chapter 71: Landscaping and Buffers. Article IV: Green Roofs. Section 71-251: Area of "green roof"

- Neither defines green roof, nor gives standards. Offers open space incentives.
- *For multi-family, non-residential uses and mixed-uses, the area of a "green roof" may be counted as open space for the purpose of meeting the open space requirements herein. Green roof area may be substituted for ground level open space at a ratio of one square foot of open space for 1.5 square feet of green roof area. A "green roof" is defined as the area of a roof covered with soil and planted with landscape material.*

Hillsborough County (Florida). 2016. *Land Development Code*. Article VI: Design Standards and Improvement Requirements. Chapter 6.11.00: Special and Conditional Uses. Section 6.11.114: Green Roof. Article XII: Definitions. Part 12.01.00: Definitions.

- Defines standards, based on intensity of application, and requires maintenance throughout life for credit, which is 50% for shallower (extensive) and 75% for intensive (deeper).
- Definition: Green Roof: *A contained green space (also known as an eco-roof, living or vegetated roof) planted over a synthetic waterproofed membrane created by adding layers of growing medium and plants on top of a traditional roofing system which also includes a*

layer for drainage. The green space on the roof may partially or completely cover the traditional roofing system. There are two types of green roofs: extensive and intensive. Extensive green roofs generally have a soil depth of less than 6 inches, require little maintenance, and are lightweight. Intensive green roofs typically have a soil depth of more than 6 inches, require more frequent maintenance, and are heavier than extensive green roofs. In order to be classified as an intensive green roof for open space credit, the green roof must have a minimum soil depth of 6 inches.

- The area taken up by the portion of a roof which is comprised of a green roof shall constitute open space for a maximum credit of 50% for extensive green roofs and a maximum credit of 75% for intensive green roofs towards the open space required on site.

Madison (Wisconsin), City of. 2016. Code of Ordinances. Chapter 28: Zoning Code Ordinance. Section 28:211: Definitions.

- Excludes green roofs from all lot coverage calculations, but zoning code is posted as a single pdf. Perhaps easiest to download and navigate to page 320 of the PDF to find definition of "Lot Coverage."
- Lot Coverage. *The total area of all buildings, measured at grade, all accessory structures including pools, patios, etc., and all paved areas as a percentage of the total area of the lot, with the following exceptions: sidewalks or paved paths no wider than five (5) feet, pervious pavement, green roofs and decks.*

Port Orange (Florida), City of. 2016. Land Development Code. Chapter 16: Miscellaneous Regulations. Section 10: Green Roofs.

- Straightforward 1:1 provision for green roofs towards open space requirement.
- General provisions. *Nonresidential and mixed-use developments that include a green roof shall be permitted to count the green roof area toward the required open space for the development as follows:*
 - (1) *Each square foot of vegetated green roof earns a one-square-foot reduction in the required open space.*
 - (2) *Roof-top vegetation must be maintained for the life of the building. Contact information for the property owner or manager along with maintenance responsibilities shall be provided to the city with the building permit application. Green roofs are subject to periodic inspections by the community development department to ensure proper maintenance, as part of the city's commercial property maintenance program.*
 - (3) *A green roof must be certified by a licensed professional architect that it is in compliance with the Florida Building Code.*

Valparaiso (Indiana), City of. Unified Development Ordinance. Article 3 District Intensity and Bulk Standards. Section 3.207 Open Space Ratio and Landscape Surface Ratio. Part B(2): Calculation.

- Area of the green roof counts as 25% towards open space requirement.
- *LSR is calculated by dividing the total amount of landscaped and open space area on a parcel proposed for development by the area of the parcel proposed for development.*

- See Figure 3.207.B., Measurement of Landscape Surface Ratio. *Twenty-five percent of the area of a green roof counts as landscaped area in the calculation of LSR.*

Local and general standards for sloping or at grade green roofs

Bozeman (Montana), City of. 2016. *Code of Ordinances*. Chapter 38: Unified Development Code. Article 27: Park and Recreation Requirements. Section 38.27. 020: Park Area and Open Space Requirements. Part E: Residential site plans open space requirement

- At-grade and accessible green roofs count towards open space requirements.



MEMORANDUM

To: Scott Gustin, Principal Planner
Burlington Planning Commission Ordinance Committee

From: Gail Henderson-King

Date: February 23, 2017

Re: UVM Medical Center CDO Changes: Green Roofs and Lot Coverage
Green Roof Design Information

Green Roof Design Information and Resources

During the January 10, 2017 Planning Commission meeting, there were some questions on the design and definition of green roofs. We have done extensive research; gathered relevant information on the definitions, types and composition of green roofs; and talked with local landscape architects on their successes with green roof design that would be helpful to the Planning Commission Ordinance Committee.

We also reviewed the Green Roofs & Lot Coverage memorandum prepared by Scott Gustin dated March 2, 2017 for the Ordinance Committee. We compiled the following information and comments summarized below.

1. Green roof definitions

There are lots of definitions available for green roofs. Some definitions are more comprehensive and include composition requirements, and others are brief but often refer to other standards or guidelines that must be followed often related to a municipal public works department stormwater regulations.

The definitions we found don't describe the different types of green roofs, as Scott has proposed. Instead, they typically state what constitutes a green roof. In addition,

there are four types of green roofs, as described in the attached information. There will most likely be new and innovative green roof technologies and approaches in the future that would not be covered in a definition put together today if it is too narrowly focused.

Rather than describing types, we recommend a more comprehensive definition of what constitutes a green roof based on composition and planting medium depth in the definition, and clarify what's not considered one. Our recommendation for a preferred definition that is tweaked from our proposed CDO changes submitted last year:

Green Roof: A building roof that is partially or completely covered with vegetation and a growing medium, with an assembly of layers that includes a root barrier, drainage system, filter layer and installed over a waterproofing membrane. Pre-planted tray systems with green roof layers combined into small units shall qualify as a green roof. The depth of growing medium and planted material shall be at least two (2) inches to be considered a functional green roof. Container gardens with plants in pots or roofs painted a reflective color without plants shall not qualify as a green roof.

This definition, along with several other definitions, is included in the attached Green Roof Design Information document for your information.

2. Green roof composition

Green roofs are comprised of top (growing), functional (filtering and drainage), and bottom (insulation, waterproofing and structural support) layers. We have provided a typical cross section and general description of a green roof in the attached Green Roof Design Information document. A green roof can be constructed with a planting medium depth of as little as 2" and be effective and sustainable.

3. Types of green roofs

Green roofs constructed directly on a roof of a building consist of three types:

- Extensive;
- Semi-Intensive; and
- Intensive.

There are also modular tray systems that can be used. However, these have more issues regarding waterproofing that need to be addressed with modular tray systems. In addition, they often have higher construction costs than green roofs constructed directly on a roof of a building. Examples of different types of green roofs are provided in the in the attached Green Roof Design Information document.

Summary

We recommend the Ordinance Committee use a definition of a green roof that describes the composition and materials, but not include the various types, as we've proposed.

Understanding the various layers needed for green roofs is important when describing a green roof. Some basic reference to these layers should be in the definition of a green roof.

There are three types of green roofs that are built directly on a roof: extensive, semi-intensive, and intensive; in addition to a modular tray system. Each has different requirements of planting medium depths and what they can support, as shown in the Green Roof Design Information provided.

Attached are the following documents for your information with additional information available at the websites listed in the Green Roof Design Information:

- Green Roof Design Information dated February 2017
- Green Roof Systems from greenrooftechnology.com

This information should be helpful for clarifying the definition and different types of green roofs.

GREEN ROOF DEFINITION

What are Green Roofs? Having a good definition of a green roof in the Burlington CDO is important. It should include a clear description of what qualifies as a green roof. Some municipalities have tied the definition of a green roof with stormwater manuals/standards. Here's several definitions we've found with our preferred definition highlighted in red.

PREFERRED DEFINITION - Covers composition needs, addresses container gardens

Green Roof: A building roof that is partially or completely covered with vegetation and a growing medium, with an assembly of layers that includes a root barrier, drainage system, filter layer and installed over a waterproofing membrane. Pre-planted tray systems with green roof layers combined into small units shall qualify as a green roof. The depth of growing medium and planted material shall be at least two (2) inches to be considered a functional green roof. Container gardens with plants in pots or roofs painted a reflective color without plants shall not qualify as a green roof.

- Adapted from Sustainable Land Use Code Model Regulations: Green Roof Incentives (Chapel Hill, NC), by Clarion dated February 2013

Other Definitions (Several versions with different approaches to green roof composition):

Green Roof: A roof of a building that is partially or completely covered with vegetation and designed to meet the Maine Stormwater Best Management Practices Manual standards and recommendations. A green roof installation must serve the purpose of reducing stormwater runoff through retention or slowing and consist of an assembly that at a minimum includes a root repellent system, a drainage system, a filtering layer, a growing medium and plants, and shall be installed on a waterproof membrane. The vegetated area of a green roof may be considered pervious for zoning impervious calculations.

- From India Street Form-Based Code District, Portland, Maine

Green Roof: An area atop a roof surface on a building, open to the sky and air, which is surfaced with soil and living plant materials for the purpose of retaining rainwater and absorbing heat from sunlight. The depth of soil and planted material shall be at least two (2) inches to be considered Functional Green Roof Area. For the purposes of maintaining the plant material, Functional Green Roof Area may be accessible by means of a roof entrance.

- From Article 22 Sustainable Design and Development, Cambridge Development Code, Cambridge, Massachusetts

Green Roof: An extension of an above grade roof, built on top of a human - made structure, that allows vegetation to grow in a growing medium and which is designed, constructed and maintained in accordance with the Toronto Green Roof Construction Standard.

- From Toronto Municipal Code, Chapter 492 Green Roofs

TYPES OF GREEN ROOFS

Green Roof Components

Top Layers:

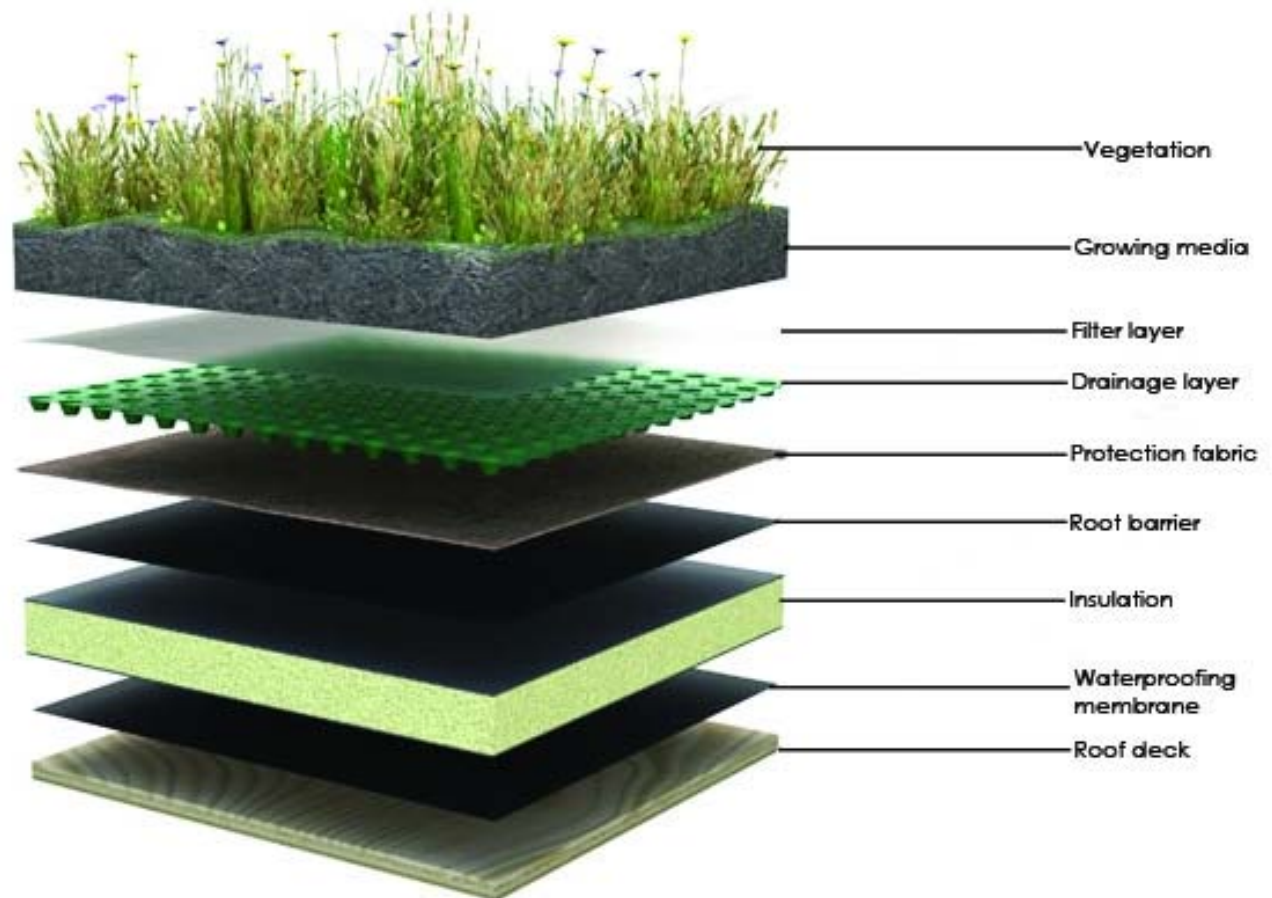
- *Vegetation:* sedums, grasses, herbaceous plants, shrubs, trees - selection based on climate, structural design, maintenance budgets, designer's intent
- *Growing medium:* the planting medium is typically a synthetically produced expanded clay that is ultra lightweight or some variation

Functional Layers:

- *Filter, Drainage, Aeration, Water Storage and Root Barrier:* these usually consist of a non-woven geotextile, a root barrier material, and can include a water storage system

Bottom Layers:

- *Insulation:* typically required to meet building codes for the building regardless of the green roof insulating benefits
- *Waterproofing Membrane Protection:* important for building protection
- *Structural Support (roof deck):* designed to handle the additional weight of a green roof



TYPES OF GREEN ROOFS

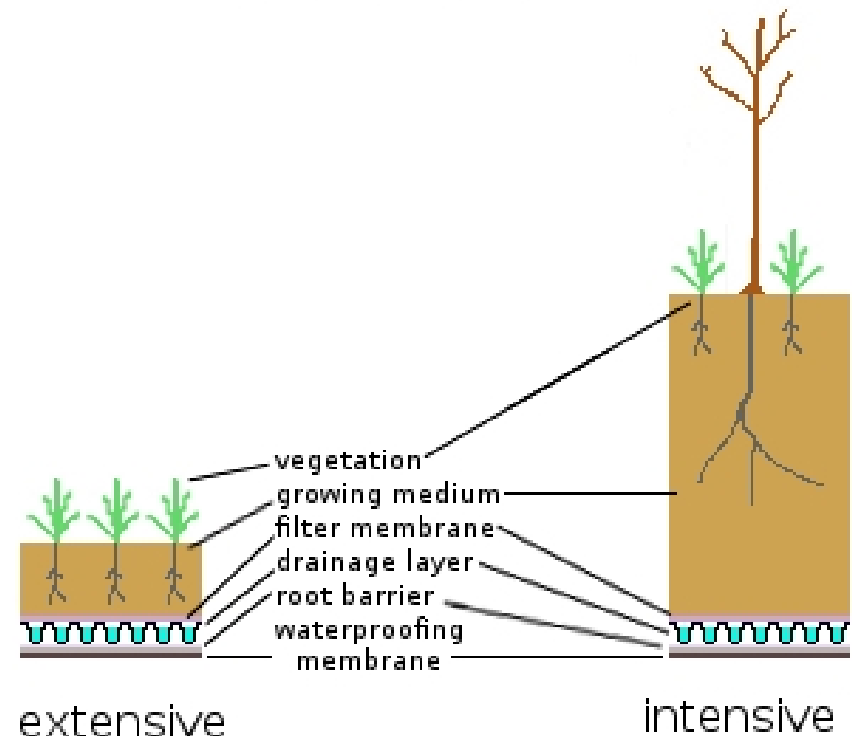
There are three main types of green roofs:

- **Extensive**
 - Planting medium: 2" to 6" depth
 - Supports 10 to 25 pounds of vegetation (plants) per square foot
 - Low maintenance requirements, no permanent irrigation system
 - Plant materials typically include perennials and ornamental grasses

- **Semi-Intensive**
 - Planting medium: varies from up to 6" or 12" depth
 - Supports 25 to 40 pounds of vegetation (plants) per square foot
 - Can retain more stormwater than extensive system
 - Can include irrigation as needed
 - Plant materials can include larger sizes such as small shrubs and small trees; greater plant diversity

- **Intensive**
 - Planting medium: 1' to 3' depth
 - Supports 80 to 150 pounds of vegetation (plants) per square foot
 - Can retain more stormwater than extensive or semi-extensive green roofs
 - Often includes irrigation
 - Plant materials include larger sizes such as medium to tall shrubs and small to large trees; greatest plant diversity

Green roofs:



There is also a fourth type of green roof:

- **Modular System**
 - Planting medium and plant materials contained in special trays
 - Still need waterproofing membrane, as this can be an issue
 - Plant materials typically include perennials and ornamental grasses

TYPES OF GREEN ROOFS

**Extensive Green Roof
Examples****Swarthmore College David Kemp Hall,
Pennsylvania:**

- 3" growing medium depth
- Mix of sedums, herbs, cacti

**Bronx County Courthouse,
New York:**

- 2 1/2" to 3" growing medium depth
- Mix of sedums, hardy herbs, small grasses
- 10 story elevation in city center location

TYPES OF GREEN ROOFS

Extensive Green Roof Example - Vermont

UVM Medical Center Radiation Oncology Building, Vermont:

- 3"+ growing medium depth
- Mix of grasses, perennials, vegetable plants



Heritage Aviation, South Burlington:

- 2 "+ growing medium depth
- Mix of Sedums and other plants

TYPES OF GREEN ROOFS

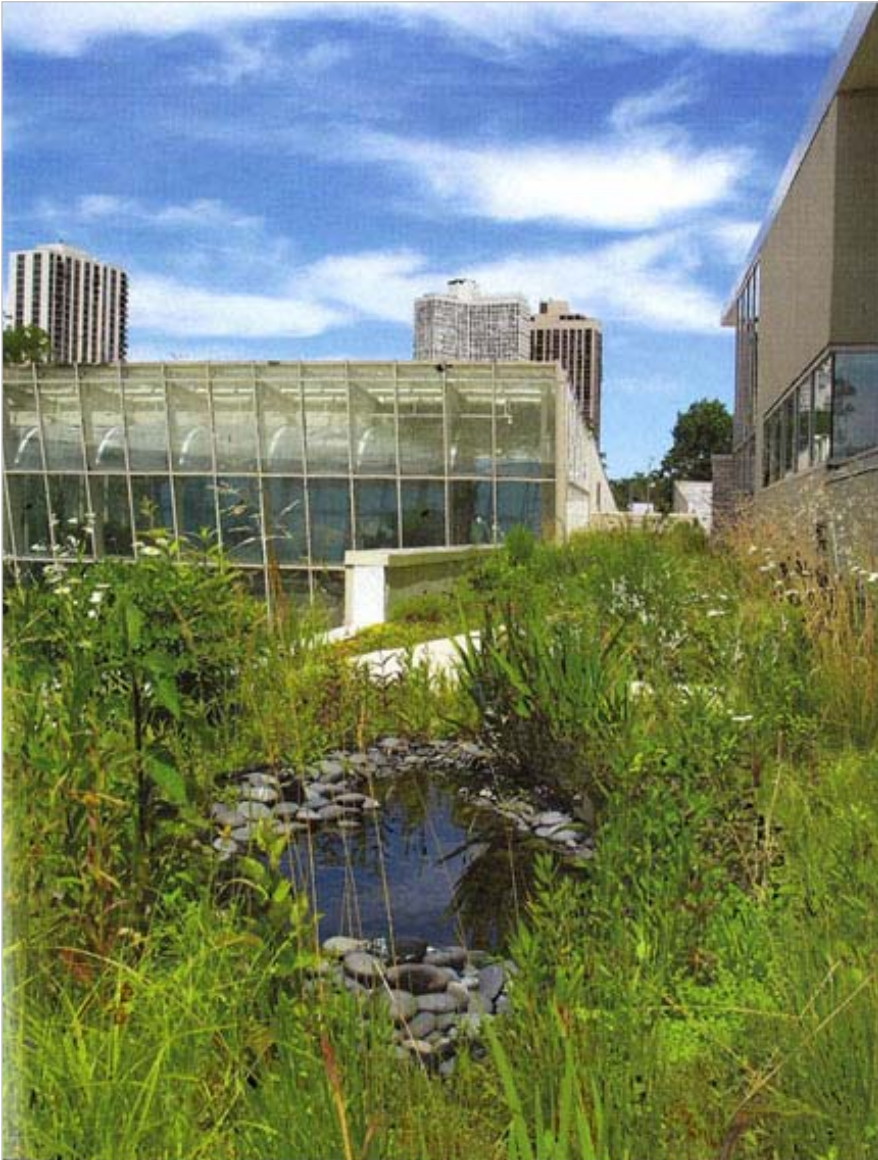
**Semi - Intensive Green
Roof Examples****Carnegie Mellon Hamerschlag
Hall, Pennsylvania:**

- 2 1/2" to 6" growing medium depth
- 28 Different Plant species: sedums, herbaceous plants, tall grasses, and small shrubs

**Free Library of Philadelphia,
Pennsylvania:**

- 6" to 12" growing medium depth
- Mix of plants: grasses, sedums, herbaceous perennials

Intensive Green Roof Examples



Chicago City Hall, Illinois:

- 4" to 18"+ growing medium depth
- Over 150 plant species including woody shrubs, vines and trees



Peggy Notebeart Museum, Illinois:

- 2 1/2" to 8" growing medium depth
- Supports range of plant materials from grasses, herbaceous plants, wetland plants and small trees

TYPES OF GREEN ROOFS

Intensive Green Roof Example - Vermont

UVM Medical Center - Ambulatory Care Center, Burlington:

- 6" to 18"+ growing medium depth
- Plant species including woody shrubs, perennials and trees



Websites with Information on Green Roofs:

Green Roof Technology - Great resource for information on green roof designs and examples

<http://www.greenrooftechnology.com/>

Green Roofs for Healthy Cities - Information on green roof design

<http://www.greenroofs.org/>

City of Toronto, Ontario Green Roof Information

[http://www1.toronto.ca/wps/portal/contentonly?
vgnextoid=3a7a036318061410VgnVCM10000071d60f89RCRD#know](http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=3a7a036318061410VgnVCM10000071d60f89RCRD#know)

City of Philadelphia, Pennsylvania Green Roof information

http://www.phillywatersheds.org/whats_in_it_for_you/residents/green-roofs

Minnesota Stormwater Manual: Green Roofs

https://stormwater.pca.state.mn.us/index.php?title=Design_criteria_for_green_roofs

National Park Service - Green Roof information

<https://www.nps.gov/tps/sustainability/new-technology/green-roofs.htm>

Search

Search the Site

Search the site

Search

MENU +

Green Roof Systems

With the German evolution of **modern green roof technology** in the last 4 decades more and more **green roof systems** have been developed and existing systems or green roof components have been improved. There are multiple manufactures that offer different green roof solutions for any size of roof. Some systems are better for smaller application other green roof systems are more efficient for large projects. Sometimes a combination of different systems can be the ideal solution in regard of performance, installing costs, maintenance and efficiency.

GREEN ROOF SYSTEMS according FLL	SYSTEMS WITH GRANULAR DRAINAGE				SYSTEMS WITH DRAINAGE PLATES			
	G1	G2	G3	G4	P1	P2	P3	P4
typical plants	sedum herbs	sedum herbs perennials	perennials grasses shrubs	grasses shrubs trees	sedum herbs	sedum herbs perennials	perennials grasses shrubs	grasses shrubs trees
extensive soil mix	2"	4"	-	-	3"	5"	-	-
intensive soil mix	-	-	6"	9"	-	-	8"	12"
separation fabric	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"	1/8"
granular drainage	2"	2"	4"	6"	-	-	-	-
drainage plate	-	-	-	-	1"	1-1/2"	1-1/2"	2-1/2"
drainage mat	-	-	-	-	-	-	-	-
protection mat	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
nominal thickness	4"	6"	10"	15"	4"	7"	10"	15"
dry weight	19 lbs/ft ²	28 lbs/ft ²	45 lbs/ft ²	69 lbs/ft ²	14 lbs/ft ²	23 lbs/ft ²	34 lbs/ft ²	52 lbs/ft ²
saturated weight	26 lbs/ft ²	41 lbs/ft ²	70 lbs/ft ²	105 lbs/ft ²	23 lbs/ft ²	37 lbs/ft ²	57 lbs/ft ²	85 lbs/ft ²
minimum slope	0:12	0:12	0:12	0:12	1/4:12	1/4:12	1/4:12	1/4:12
maximum slope	1:12	1:12	1:12	1:12	1:12	1:12	1:12	1:12
water retention/Year*	50%	60%	70%	80%	50%	60%	70%	80%
irrigation system	-	-	subsurface	subsurface	-	-	surface	surface

© Text and Design: www.greenroofservice.com 10/2006

* conservative numbers

All **green roof systems** and **green roof design** must meet the **FLL-Guideline** and must last as long as the building where implemented. Traditionally the German manufactures meet these benchmarks. Unfortunately a lot of North American green roof products were originally develop for other purposes (e.g. vertical drainage, erosion control, shipping container etc.) and might cause problem in the years to come.

An increasing number of newly developed **tray or modular green roof systems** is getting very popular in countries with less technical and horticultural common sense. They are often sold to installation companies that work without professionals or less skilled labor. It seems like an easy installation but **the installation** is only a fraction of the entire picture and the history of German trays introduced in 1978 tells a different story. In most cases the performance of pre-planted boxes can't meet our expectations that consider the workflow from manufacturing, shipping, installation to performance and maintenance for the next 30-50 years.

Finding Green Roof Solutions That Work for You

Green roof systems have to be flexible enough to allow a custom tailored solution that exactly fits the clients needs, the clients design intent or given elements set by the building. Green Roof Technology has the largest resource and documentation of any type of green roof project done in the last 35 years. There is no project design or project detail that haven't been done before somewhere else (hard to believe for architects) and exactly this experience we utilize for any new project to deliver a living roof on which plants can simple sustain and thrive with an clearly defined effort.

Green Roof Technology, doesn't reinvent the wheel and we don't over engineer. Keeping all process as efficient as possible is the the goal and our best management practice (BMP). With a dedicated team of experts, **Green Roof Technology** is equipped to respond to any unique opportunities or challenges of any project. We encourage you to explore this website to learn more about **green roof systems** or [contact us](#).

Typical Green Roof Components

- Protection Fabric
- Retention Fabric
- Drainage Plates
- Drainage Mats
- Drainage Channels
- Filter Fabric
- FLL approved growing media

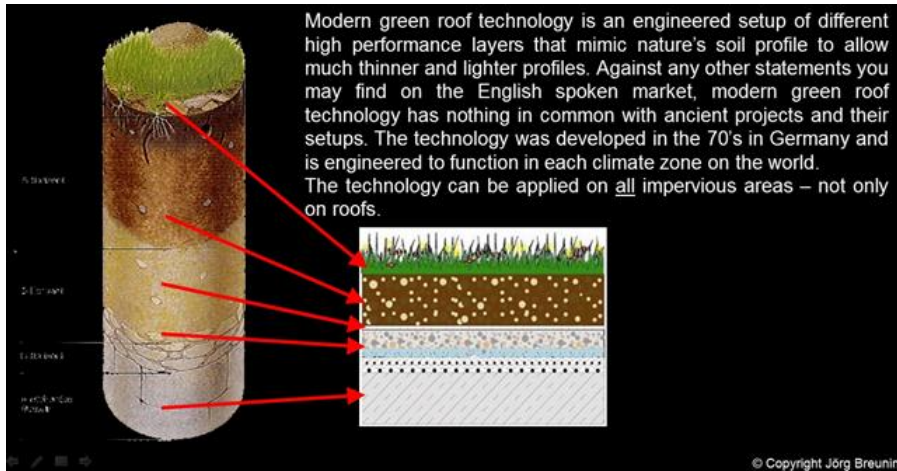
Granular Drainage System

A granular system uses specially engineered light weight drainage media for its lower level drainage layer. While it may be a little heavier than a drainage board system of an equal depth the advantage of a granular drainage system is all the pore space and surface area of the media. These tiny pores trap moisture and hold it longer so that the plants can access during droughts. Also, even though there is no organic matter in this layer all the tiny pores and crevices trick the plants into thinking the soil is deeper encouraging them to send out more roots.

Drainage Board /Plate System

Drainage board, plate, or "egg crate" systems are a wonderful system when you need to maximize stormwater retention yet have as light weight a structure as possible. The composition of these boards comes in a variety of materials and water holding capacities to meet any number of weight, insulation, and water holding needs.

Anatomy of a Green Roof System



SHARE     

Latest Blog Posts

1. World's First Modular Green Roof System Green Team at Green Roof Technology, 12-Feb-2017
2. Norwegian Green Roof Log Cabins in the USA Green Team at Green Roof Technology, 01-Feb-2017



Testimonials

"Green Roof Technology is a key member for Green Roofs for Healthy Cities and continues to make important contributions to its ongoing development."

Steven W. P.
Founder and President
Green Roofs for Healthy Cities



Sign Up For Our Newsletter!

Full Name

Email Address



MEMORANDUM

To: Scott Gustin, Principal Planner
Burlington Planning Commission Ordinance Committee

From: Gail Henderson-King

Date: February 24, 2017

Re: UVM Medical Center CDO Changes: Green Roofs and Lot Coverage
Green Roof Lot Coverage Policy Information

Green Roof Lot Coverage Policy Information

On behalf of UVM Medical Center, we originally proposed three different scenarios for addressing lot coverage credit for green roofs:

- Where a building is wholly or substantially underground with a green roof substantially at grade, it would be counted as 100% green space;
- Where a green roof is on top of a conventional above-ground building (fully above grade) and not accessible at grade, it would be counted as 50% green space; and
- Where a building is partially underground such that in one or more direction the roof is substantially at grade with the surrounding land, but more than 50% of all sides of a building are visible, shall count 75% of the green roof area as green space.

The Planning Commission Ordinance Committee agreed when a building is underground with a green roof substantially at grade, that it would be counted as 100% green space. They also agreed that they would not give any credit to a green roof on the roof of a building that is not accessible at grade. The proposed approach by the Ordinance Committee to handle a green roof partially at grade was to count what is at grade as green space (lot coverage credit) and everything above grade not counted as green space (no lot

coverage credit). The Planning Commission had questions about this approach during their review at their meeting on January 10, 2017: they felt there should be a consistent way to measure this for green space credit, and sent it back to the Ordinance Committee for further review.

We reviewed the Green Roofs & Lot Coverage memorandum prepared by Scott Gustin dated March 2, 2017 for the Ordinance Committee, and have prepared the following comments and information.

Lot Coverage Calculation Requirements

Overall, we applaud the new Lot Coverage Requirements section prepared by Gustin as it now proposes a lot coverage credit for partially at grade green roofs that is straightforward and easy to apply. However, we do have some comments on the proposed language.

- Partially at-grade green roofs are proposed to be counted as green space if they are open and accessible to the public. In our research, we haven't found municipalities giving green space credit based on whether the green roof is open and accessible to the public. There are communities that tie credit to access for the building occupants.
 - Aventura, Florida grants lot coverage bonus based on several things, one of which is that the green roof is "...maintained for the common benefit of building occupants..."Allowing access to building occupants is different from being open and accessible to the public though.

Green roofs can be accessible to the public whether they are at grade, above grade or partially at-grade. However, the benefits of green roof don't rely on public access; they absorb stormwater runoff, reduce urban heat island effects, reduce energy demand, improve air quality, create wildlife habitat, and provide green space. Many green roofs have existed for years and while they provide green space, it may not be accessible to the public. However, this shouldn't discount their extensive benefits to the community and the building owner.

We recommend eliminating the language related to green roofs being open and accessible to the public.

- Extensive and intensive green roofs have similar benefits and should both have the same lot coverage credit. Each type of green roof will have both environmental, energy, and stormwater benefits to name a few. Based on this, we believe the lot coverage credit for partially at-grade green roofs should be universally the same for all types.

We recommend changing the lot coverage credit for partially at-grade green roofs to be the same for all types, and propose changing the wording as follows:

- *Partially at-grade green roofs will be counted at 50% lot coverage of their total roof area.*

Summary

For the Lot Coverage Requirements, we agree with providing lot coverage credit for partially at-grade green roofs with the following changes to the proposed language:

Eliminate the language related to green roofs being open and accessible to the public.

Change the lot coverage credit for partially at-grade green roofs to be the same for all types, and propose changing the wording as follows:

- *Partially at-grade green roofs will be counted at 50% lot coverage of their total roof area.*

The Planning Commission Ordinance Committee could consider giving lot coverage credit for green roofs in limited zoning districts, if desired.

Attached are the following documents for your information:

- How Your Community Will Benefit From Adopting Green Roof Policy, Green Roofs for Healthy Communities



How Your Community Will Benefit From Adopting Green Roof Policy

Your Community Will Benefit From Adopting Green Roof Policy



For every dollar
spent on green roofs
\$0.75-0.85 goes
towards local job
creation in:

- Design
- Consulting
- Manufacturing
- Construction
- Maintenance



Green roofs have the
ability to decrease
the volume and
increase the quality
of stormwater runoff
and slow down the
velocity of a typical
“first flush”

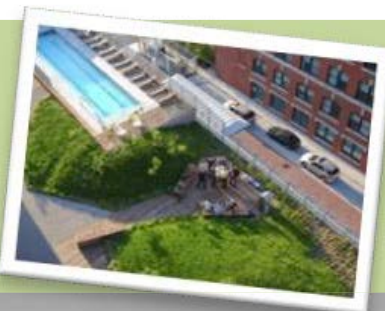
- Green roofs are the perfect technology for North American cities because they provide *more* unmatched dollar-for-dollar public and private benefits than any other grey or green infrastructure available today.
- Numerous government agencies and municipalities have recognized green roof benefits and incorporated supportive policies into their green infrastructure procurement and green building programs.
- Green roofs typically occupy unused urban spaces – rooftops which may comprise anywhere from six to thirty-five percent of your land area.
- Green roofs can be incorporated into new construction and retrofit projects.
- Greening this “fifth facade” of a building introduces countless economic, environmental and social opportunities to your community.
- Green roof benefits are both public and private in nature.

**Green roofs require more investment upfront
than typical roofs but deliver multiple public
and private benefits.**

Typical Public and Private Benefits of Green Roofs

PUBLIC	PRIVATE
Creates local jobs	Aesthetic improvement
Improves stormwater management - quality and quantity	Energy savings
Improves air quality	Increases property value
Increases biodiversity	Increases employee productivity
Decreases municipal infrastructure costs	Reduces employee absenteeism
Increases tax revenues	Increases roof membrane durability
Reduces the urban heat island effect and peak load energy demand	Improves solar panel efficiency
Improves community health and well- being	Meets stormwater and green space regulations
Facilitates new recreational opportunities	Improves marketability
Reduces greenhouse gas emissions	Urban agriculture revenue potential

For more benefit information see ‘About Green Roofs’ at www.greenroofs.org.



“Rooftop gardening is an attractive and energy-saving alternative to a conventional rooftop. Rooftop gardens can keep buildings cooler, save energy, extend the useful life of the roof, and add beauty and useable space.”

- Richard M. Daley (Former Chicago Mayor)

Green Infrastructure Complements Traditional Grey Infrastructure

Green infrastructure includes a variety of vegetative technologies such as:

- Greenways
- Restored and constructed wetlands
- Urban forests
- Rain gardens
- Permeable and pervious paving systems
- Community gardens
- Green roofs
- Green walls
- Bioswales

Green infrastructure can complement traditional grey infrastructure by retaining stormwater, shading surfaces such as asphalt and membranes, providing wind breaks, and reducing energy demand. Green infrastructure can also help restore degraded habitat, reconnect people to nature, provide food and recreational opportunities and improve the overall urban aesthetic. Green infrastructure often costs less to install and maintain when compared to grey forms of infrastructure such as centralized water storage tunnels and sewers. Green infrastructure can generate local green jobs and even foster greater community cohesiveness.



According to a 2010 study titled "The Monetary Value of the Soft Benefits of Green Roofs" by Dr. Ray Tomalty et al. homes adjacent to public parks have about a 20% higher property values than similar homes distant from parks. The study estimates that the property value will increase by approximately 11%, depending on the size and access to a green roof. Having a view of a green roof with trees is estimated to increase property values by as much as 9%. Higher property values translate into higher tax revenues.

(http://www.greenroofs.org/resources/Monetary_Value_of_Soft_Benefits_of_Green_Roofs.pdf)

The American Society of Civil Engineers (ASCE) is committed to protecting the health, safety, and welfare of the public, and as such, is equally committed to improving the nation's public infrastructure. To achieve that goal, the 2013 "Report Card for America's Infrastructure" depicts the condition and performance of the nation's infrastructure in the familiar form of a school report card. The ASCE gave wastewater and stormwater infrastructure a letter grade of D for 2013. They estimate the capital investment needed for the nation's wastewater and stormwater systems to total \$298 billion over the next twenty years. Pipes represent three quarters of the total capital need. Fixing and expanding the pipes will address sanitary sewer overflows, combined sewer overflows, and other pipe-related issues. Green infrastructure complements grey infrastructure by naturally managing stormwater, reducing flooding risk, erosion, and improving water quality.



Green walls are an emerging form of green infrastructure with benefits such as:

- Air Quality Improvements (Indoor/Outdoor)
- Aesthetic Improvement
- Urban Heat Island Reduction
- Job Creation
- Noise Reduction
- Health and Well-being



Green roofs improve the efficiency of solar panels, cool cities and reduce peak energy demand

"The green approach could not work without a good traditional foundation. Pipes and sewers are the backbone of our system, but the green helps the grey do a better job."

- Joanne Dahme (General Manager Public Affairs - Philadelphia Water Department)

About Green Roofs



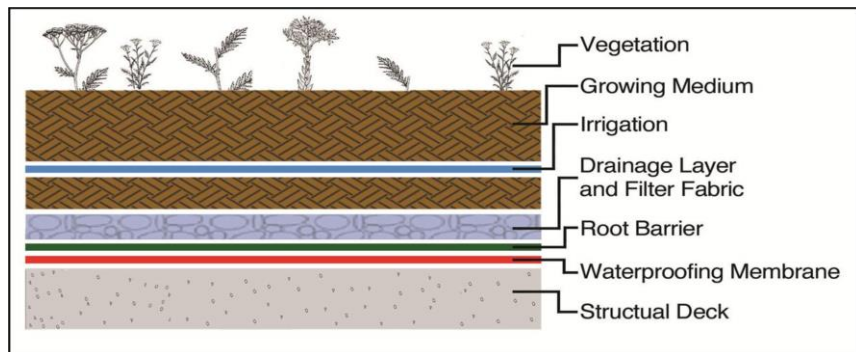
The Green Roof Industry has grown 10 fold in North America since 2003

Green Roofs for Healthy Cities estimates that over 20 million square feet of green roofs were installed in North America in 2012. Globally, green roofs are a multi-billion dollar industry.



Green roofs can be designed to achieve different objectives, such as maximizing stormwater retention, improving air quality, supporting biodiversity or providing recreational green space.

Modern green roofs emerged in Germany in the 1960s but vegetation has been used as roofing material for thousands of years. A green roof, also known as a vegetated roof, rooftop garden, living roof, or eco-roof, is an extension of an existing roof which involves high quality waterproofing membrane, root repellent system, drainage system, filter cloth, lightweight growing medium (soil), irrigation system, and plants. Green roof implementation involves the creation of "contained" green space on top of a human-made structure. This green space could be below, at, or above grade, but in all cases the plants are not planted in the "ground".



Two Main Types of Green Roof Systems

- **Modular (see right):** drainage layers, filter cloth, growing media and plants are prepared in movable, sometimes interlocking grids, and mats.
- **Loose-laid/ built-up:** each component of the system is installed separately and they are layered on top of each other.



Many different green roof products can be used to respond to specific design opportunities and constraints. While all green roof systems contain the same basic components, the products and installation methods used will vary to meet design requirements, project constraints, and benefit objectives, making each green roof unique. There are three basic categories of green roof infrastructure: extensive, semi-intensive, and intensive. The characteristics of each are described below.

General Characteristics of Three Main Green Roof Types

	EXTENSIVE	SEMI-INTENSIVE	INTENSIVE
Growing Medium Depth	6" or less	25% of the green roof area above or below 6"	More than 6"
Accessibility	Often inaccessible	May be partially accessible	Usually accessible
Fully Saturated Weight	10–35 lb. / sq. ft.	35–50 lb. / sq. ft.	35–300 lb. / sq. ft.
Plant Diversity	Low	Greater	Greatest
Cost	Lowest	Varies	Highest
Maintenance	Minimal	Varies	Varies, but is generally high

Green Roofs are a Proven Technology

The GSA and the EPA Recommend and Utilize Green Roofs

The Environmental Protection Agency (EPA) recognizes green roofs as an innovative Best Management Practice. The EPA has stated that the large-scale implementation of green roofs will reduce the volume of stormwater entering local waterways resulting in less in-stream scouring, lower water temperatures and better water quality. EPA related initiatives:

Green Infrastructure Action Plan

- Aims to increase national and local capacity to evaluate the role of green infrastructure and the benefits that it can provide.

Clean Water Act

- Mandated by Congress and enforced by the EPA.
- Implemented by municipalities.
- Main goals are to: reduce stormwater quantity; increase stormwater quality; increase stormwater delay.

National Pollutant Discharge Elimination System (NPDES) permit program

- EPA developed and implemented this program based on the requirements of the *Clean Water Act*.
- Controls water pollution by regulating point sources that discharge pollutants into US waterways.
- Polluted stormwater runoff is commonly transported through Municipal Separate Storm Sewer Systems (MS4s), from which it is often discharged untreated into local water bodies. Each regulated MS4 is required to develop and implement a stormwater management program (SWMP) to reduce the contamination of stormwater runoff and prohibit illicit discharges.

Urban Heat Island Initiative

- The annual mean air temperature of a city with 1 million people or more can be 1.8–5.4°F (1–3°C) warmer than its surroundings. In the evening, the difference can be as high as 22°F (12°C).
- Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and mortality, and water quality.
- Every 1.08°F increase in air temperature can add 1.5 to 2% to peak energy demand for cooling.
- Green roofs, green walls and trees cool cities through shading and evapotranspiration of water.

The GSA routinely installs green roofs and currently maintains more than 24 green roofs in 13 cities.



Highlights from 2011 Congressional report titled: "Benefits and Challenges of Green Roofs on Public and Commercial Buildings" include:

- The average life expectancy of a waterproof membrane under a green roof is about 40 years, versus 17 for a conventional roof. Numerous membranes under green roofs have outlived that time period having been in place since the 1930s.
- Green roofs reduce costs by producing savings related to stormwater regulations and reduced stormwater runoff impacts, notably combined sewer overflows, due to their water absorption properties. Nationally, extensive green roofs provide \$0.084 per square foot in annual savings in stormwater based on current regulations.
- Green roofs provide year-round energy savings due to their cooling, shading, and insulating abilities.
- Green roofs reduce the urban heat island effect, peak load demands and can reduce heat-related illness and mortality in cities.
- Nationally, peak load reduction is conservatively estimated to be worth \$0.23 per square foot per year.

Federal Funding Sources for Green Infrastructure Incentives

- Clean Water State Revolving Funds
- Section 319 Nonpoint Source Management Grant
- Watershed Specific Federal Grant
- National Fish and Wildlife Foundation (NFWF) Grant
- U.S. Environmental Protection Agency Urban Water Program
- FEMA flood management grants
- US Department of Agriculture grant and cost share for urban agriculture projects
- Other federal grants from National Oceanic and Atmospheric Administration, US Geological Survey, Fish and Wildlife of the US Department of Interior

"Green roofs can be effectively used to reduce stormwater runoff from commercial, industrial, and residential buildings. In contrast to traditional asphalt or metal roofing, green roofs absorb, store, and later evapotranspire initial precipitation, thereby acting as a stormwater management system and reducing overall peak flow discharge to a storm sewer system."



- Environmental Protection Agency (EPA)



With policy support, green roofs can become a sound investment for “big box” stores

A three-year study managed by Walmart proved that green roofs provide a payback on investment in less than 20 years and should be considered as a viable option to replace reflective white roofs.

In three of the nine regions analyzed it was determined that a return on investment was achieved in as little as 0-3 years. This was mainly due to regional policies that support green roof installation.



There are over 600 trained and accredited Green Roof Professionals in North America

How Municipalities Develop a Local Green Roof Industry

Due to their many public benefits municipal leaders are providing regulatory policies that require green roofs on new buildings, and/or financial incentives that reduce the higher initial costs for new and existing building owners. A major congressional study by ARUP Engineering for the GSA found that extensive green roofs, over a 50 year period, deliver an average of over \$38/square foot of public benefits, nationally.

Tools Used To Support Local Green Roof Installation

Policies

- Green Building Standards
- Green Landscape Standards
- Fast Track Permitting
- Green Space Allocation
- Education and Awareness
- Procurement
- Support Local Research

Financial Incentives

- Direct Incentives
- Density Bonuses
- Direct Investment/Grants
- Indirect Incentives
- Tax Credits/Rebates
- Low Interest Loans
- Energy Efficiency Incentives
- Stormwater Fee Rebates

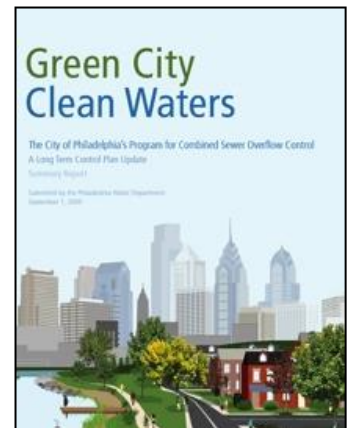
Philadelphia's Green City, Clean Waters

Green City, Clean Waters is Philadelphia's 25-year plan to protect and enhance its watersheds by managing stormwater with innovative green infrastructure.

The Philadelphia Water Department (PWD) developed *Green City, Clean Waters* to provide a clear pathway to a sustainable future while strengthening the utility, broadening its mission, and complying with environmental laws and regulations.

PWD developed this program when they were faced with developing a viable long-term stormwater management plan to meet their obligations under the EPA's *Clean Water Act*. During this process the PWD saw an opportunity to reinsert nature into what had become an unnatural equation.

Instead of opting to expand the traditional grey infrastructure and build more pipes and tanks to treat wastewater, they chose to invest in green infrastructure. A cost benefit analysis showed that it would cost \$2.4 billion over 25 years for the green infrastructure approach as opposed to \$8 billion for grey infrastructure. The City of Philadelphia created a Green Roof Tax Credit program that provides up to 25% of all costs incurred to construct a green roof to a maximum of \$100,000 per project.



“Elected officials and politicians across America, not only in progressive cities, need to embrace green walls and roofs as best management practices in government approvals process. Approval authorities should consider the inclusion of these amenities as alternative compliance for greening requirements and as a way to reduce stormwater runoff.”

- Lisa R. Goodman (Minneapolis City Council Member)

Municipal Green Roof Policy Initiatives at a Glance

Chicago, IL: Green Roof Permit Program

- Many incentives and an expedited building permit program.

Devens, MA: Vegetated (Green) Roof Construction Standard

- Green roofs and green walls are a requirement for new development under this construction standard.

Grand Rapids, MI: Greenspace Provision

- Green roofs and green walls qualify under this provision.

Milwaukee, WI: Regional Green Roof Initiative

- \$5 for each square foot of approved green roof.

Minneapolis, MN: Stormwater Credit Program

- Up to 100% discount on stormwater utility fees for properties that manage their stormwater quality and quantity. Green roofs are listed as an applicable tool.

Nashville, TN: Green Roof Credit

- A \$10 rebate for each square foot of green roof.

New York, NY: Green Roof Tax Abatement

- A \$5.23 rebate for each square foot of green roof up to \$200,000 per project.

Philadelphia, PA: Green Roof Tax Credit

- A credit of up to 25% of all costs incurred to construct a green roof with a maximum of \$100,000 per project

Portland, OR: Floor Area Ratio (FAR) Bonus

- 10-30% Green Roof = 1 extra square foot of floor area.
- 30-60% Green Roof = 2 extra square feet of floor area.
- 60%+ Green Roof = 3 extra square feet of floor area.

Syracuse, NY: Green Improvement Fund

- Funding available to projects utilizing green infrastructure solutions and elements. Nearly \$4 million towards 37 projects so far, many include green roofs.

Toronto, ON: Green Roof Bylaw / Procurement

- Green roofs are required on all new commercial, institutional, multi-unit residential developments and new buildings not affected by the bylaw. Incentives of \$7 per square foot. Over 2.5 million square feet permitted.
- Green roofs required on public buildings.

Seattle, WA: Green Factor Program

- Green roofs and green walls qualify under this program which sets minimum green infrastructure thresholds for new and redevelopment.

Washington, DC: Green Roof Rebate Program

- Base funding between \$7 and \$10 per square foot of green roof depending on the project's sewage shed area.



Green roofs on hospitals speed up patient recovery



Green roofs can provide communities with additional park space

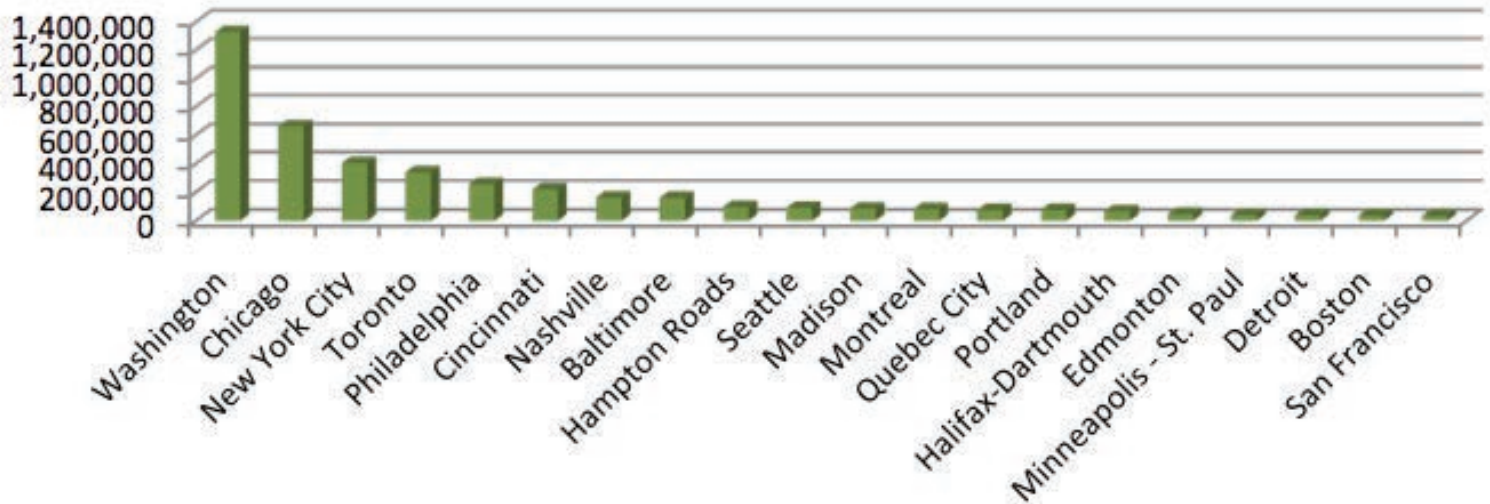


Green roofs increase community resilience and jobs by facilitating rooftop agriculture

“Green roof incentives deliver taxpayer value by leveraging private roofing investments; exploiting wasted roof space; eliminating negative black roof impacts, and replacing them with infrastructure that manages stormwater, improves air quality, saves energy, reduces the urban heat island, supports biodiversity, creates beauty, local jobs and last decades longer. Few if any public infrastructure investments yield so many public and private benefits.”

- Steven Peck, GRP, Hon. ASLA, Founder and President, Green Roofs for Healthy Cities

Top 20 North American Metro Regions - Green Roofs Installed in 2012 by GRHC Corporate Members in Square Feet



Green Roofs for Healthy Cities is available to help you develop your local Green Roof industry

- Market and Policy Development Symposiums
- Green Roof Task Force development
- City wide cost-benefit analysis of policy options
- Green Infrastructure Design Charettes
- Customized policy training and professional education

For more information please contact:

Paul Erlichman: policy@greenroofs.org;

416-971-4494 ext. 223

Corporate Leaders:



Green Roofs for Healthy Cities—North America Inc. is a not-for-profit industry association working to promote the green roof and wall industry throughout North America. Green Roofs for Healthy Cities is registered as a not-for-profit 501(c)(6). In 2007 GRHC established the Green Infrastructure Foundation, as a charitable 501 (c)(3), to promote green infrastructure education. See www.citiesalive.org for annual conference information and www.livingarchitecturemonitor.com to read our magazine.



**Burlington Planning Commission
Ordinance Committee**

149 Church Street
Burlington, VT 05401
Telephone: (802) 865-7188
Fax: (802) 865-7195
www.burlingtonvt.gov/pz

Alexander Friend
Bruce Baker
Andy Montroll
Wayne Senville
Phil Hammerslough



Burlington Planning Commission

Ordinance Committee Meeting Minutes

Thursday, March 9, 2017 @ 5:15 PM

Planning & Zoning Conference Room, Ground Floor, City Hall

Attendance

- **Committee Members:** Alexander Friend (AF), Andy Montroll (AM), Wayne Senville (WS), Phil Hammerslough (PH)
- **Absent:** Bruce Baker (BB)
- **Public:** Dave Keelty, Gail Henderson-King
- **Staff:** Scott Gustin, Mary O'Neil (Planning & Zoning)

1. Green roofs & lot coverage

Consideration of amendment pertaining to lot coverage credits for green roofs

The committee and others present discussed a revised draft affording lot coverage credit for at-grade and partially at-grade green roofs.

On a motion by PH and seconded by AF, the committee moved the proposed amendment along to the full Planning Commission for consideration.

Vote: 4-0-0.

2. Next Meeting

April 6, 2017

3. Adjournment

The Committee adjourned at 6:30 PM.

