



Green Roof Maintenance Guide



ARCHITEK

Engineered Solutions For Living Buildings



WELCOME!

Thank you for purchasing an Architek green roof. This document serves as a compilation of recommendations for a successful establishment of your roof and ongoing maintenance activities thereafter. Health, vigor, and beauty of the roof can be reached by careful attention to these guidelines. Please note that this is general information and that every roof will require customized care.

Please contact us if you need further assistance at www.architek.com



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INTRODUCTION

BASIC INFORMATION

Green roofs provide numerous benefits in many areas. Their beauty and serenity can even improve your mood, energy level, and general satisfaction. Some major benefits of green roofs are:

- Storm water mitigation
- Increased economic returns
- Reduced heat-island effect
- Biophilic design and wellness
- Acoustic buffering
- Environmental and aesthetic beautification
- Encourages biodiversity for pollinator and insect habitats

Architek encourages end-users and homeowners to employ a simple maintenance program to ensure the green roof does not just survive but thrives and flourishes – Hence, we offer post-installation maintenance and warranties for all of the green roof systems we design, supply or install. A regular maintenance plan is key to the success of your green roof. While shallow media or 'extensive' green roofs are low maintenance, they do require regular, specialized care. This manual is more focused on extensive systems planted with sedum and/or perennial groundcovers, but applies to all systems. More garden-like 'intensive' green roofs will require a level of maintenance compared to grade-level gardens. Use this manual to create a maintenance plan and document-related activities. A green roof is a living system that will grow and change. Your maintenance plan will require modification as plants mature.

Consistent, detailed documentation of maintenance activities is vital to successful green roof care. Photos along with written documentation provide the home owner, maintenance contractor and manufacturer with a valuable log should issues or questions arise. This record will help demonstrate regular maintenance was performed under warranty specifications to ensure that repairs or replacements are covered. Minimum milestones to record:

- Final Project Completion
- During Establishment Period
- Regular Maintenance Reports
- Annual Inspections

DID YOU KNOW?

The life span of a conventional roof membrane is considerably increased by the use of Green Roofs (up to 4 times). Essentially a green roof can turn a 15-year roof into a 50-year one!

Green Roofs with just 3 inches of soil can reduce the amount of rainwater run-off by over 50%. A portion of the water is returned to the atmosphere through evapotranspiration, and the remaining stormwater run-off is delayed and reduced in volume.

Did you realize that your green roof was installed by a Certified Green Roof Professional?
We are GRP Certified.



ABOUT THIS GREEN ROOF

Basic information to record about your green roof.

Building Name: _____

Building Location: _____

Roofing Trade: _____

General Contractor: _____

Date of Completion: _____

Post Install / Handover Period: _____

Long Term Maintenance Contract: YES NO _____

System Type: _____

Soil Depth: _____

Type of plants: _____

Irrigation System: YES NO Installed by: _____

MAINTENANCE CHECKLIST

Typically, the green roof installer will cover the initial maintenance of the roof post-installation which is determined by the owner and the green roof's needs. This period will vary depending on the complexity of the project, and after this, it will become the Owner's responsibility to secure ongoing maintenance for the green roof. Our recommendation is contracting an experienced landscape maintenance contractor specialized in green roofs to ensure the best possible outcome.

The labor hours involved in green roof care will be determined by the complexity of each project and the owner's desired look for it. It can vary from a natural look to a more complex and manicured garden. We recommend a minimum of 3 visits a year depending on the project's complexity.

GREEN ROOF WARRANTY

We are pleased to offer a Green Roof System Warranty (see attached warranty details) when we are providing post-installation maintenance under contract. Architek also provides extended warranties for our green roof systems for roofs without a maintenance contract based on the premiums outlined in the original cost quotation depending on the length of the chosen coverage (10, 15, or 20 years). Please contact us for additional details.



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GREEN ROOF COMPONENTS

VEGETATION

Consult the project landscape architect/documents about project specific plant species selected for each design. We normally recommend the use of local sedums, plugs, and/or perennials or local grasses

GROWING MEDIA

Architek Extensive Mix: proper blend of organic matter and aggregates to an FLL standard. The growing media ensures the nutrients needed for the growth of plants, serves as a support to the roots, thus providing the ground of the growth of the vegetation. It includes mostly minerals, mixtures with proper air content, and durable good water permeability and stable structure.

RIVER ROCK EDGE

To prevent the vegetation from getting to places where it is not wanted, a 30 cm. wide edge of river rock or gravel is added around the perimeter of the green roof. This allows the river rock to function as a separation between the live area and the non-vegetated areas of a roof.

GREEN ROOF LAYERS

Root Barrier

Root resistant and vapor control layer made of 20-40 mm thick elastic polyethylene regenerate. Applicable as a vapor control layer and can be used as a root resistant layer on green roofs when lied down with a 1.0 m overlapping.

Drainage Board

Drainage boards are available in various designs and thicknesses. Specific types are selected according to the drainage target to use as a water reservoir and/or multi-directional water run-off delay. Selecting the right type for each green roof will depend on the design and function of the same.

Filter Sheet

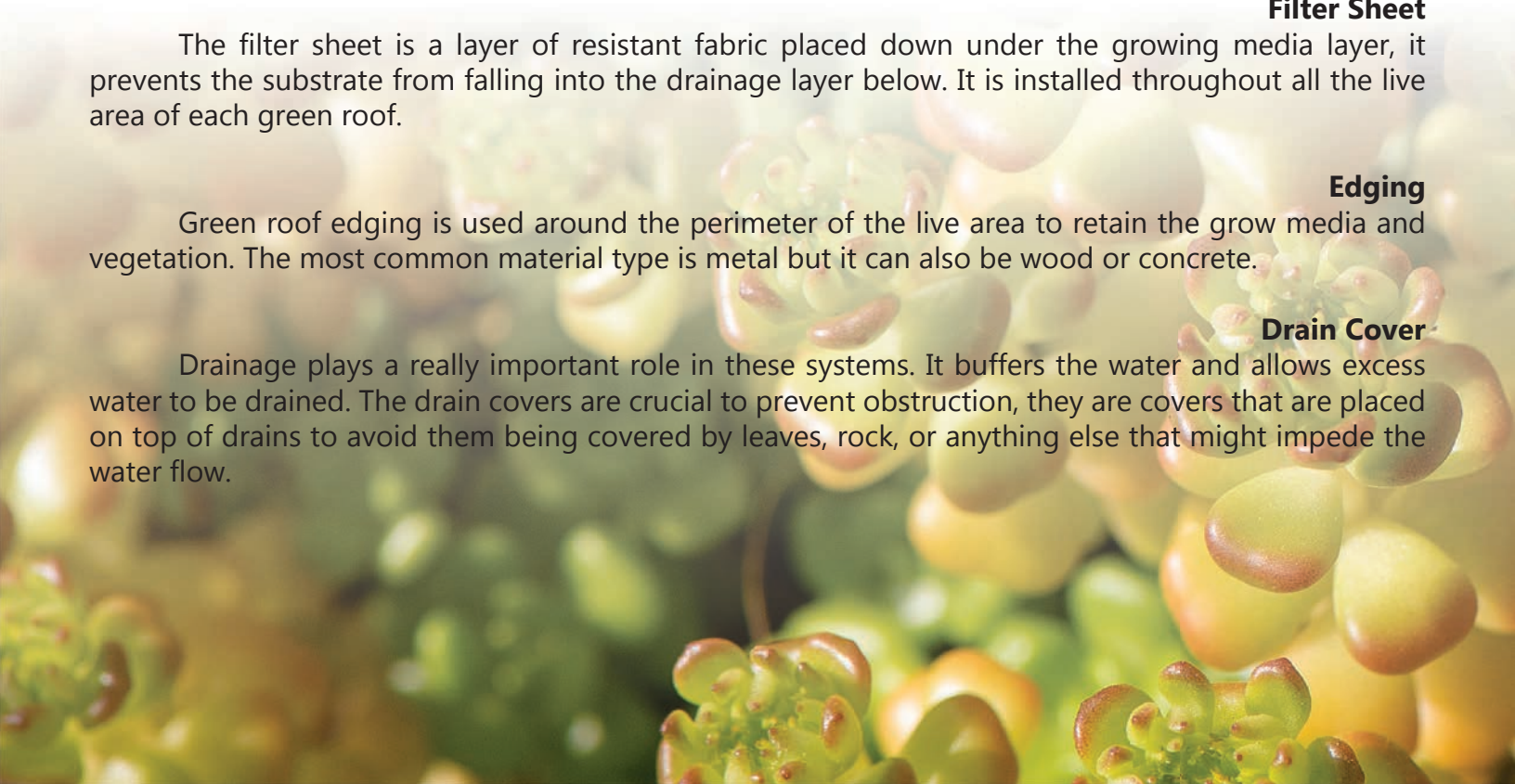
The filter sheet is a layer of resistant fabric placed down under the growing media layer, it prevents the substrate from falling into the drainage layer below. It is installed throughout all the live area of each green roof.

Edging

Green roof edging is used around the perimeter of the live area to retain the grow media and vegetation. The most common material type is metal but it can also be wood or concrete.

Drain Cover

Drainage plays a really important role in these systems. It buffers the water and allows excess water to be drained. The drain covers are crucial to prevent obstruction, they are covers that are placed on top of drains to avoid them being covered by leaves, rock, or anything else that might impede the water flow.



POST-INSTALLATION PERIOD

Once completed, we are committed to finding a long-term care solution for your green roof. The success of your green roof is of great importance to us. We look forward to working collaboratively with you to achieve a beneficial long-term partnership that will result in a healthy, thriving green roof. This reference guide includes basic information to help you achieve this.

PROTECTING THE ROOF

When your green roof is finished, the vegetation will be sensitive as it adapts and roots. Please ensure there is very minimal foot traffic on the roof to allow the plants to settle. After the plants have been established continue to ensure that there is minimal foot traffic on the plants for best results.

WATERING

After plants have been established, watering sedum green roofs once a week, early in the morning during summer and spring months is recommend. Green roofs with a high degree of diversity will require different irrigation schedules depending on the species planted.

WEATHER

Depending on the time of the year when it is finished, the green roof will require more or less care. If finished during the late Spring and Summer months, regular irrigation and care will be required. Each green roof can be discussed on a case by case basis with your green roof installation team to find the best solution to keep it looking great.

SITE-VISITS

Post-installation and depending on the weather conditions and time of year, we will provide site visits until the green roof is completed or handover has taken place.



ON-GOING MAINTENANCE ACTIVITIES

-Develop a Schedule: Maintenance depends on regularly scheduled care. The frequency of maintenance depends on what type of plants are being maintained and desired look. This can be determined collaboratively by the owner or manager to define frequency.

-Know Your Weeds: Some plants will volunteer themselves on the green roof by wind and animal dispersal, such as insects and birds, who transport seeds in their feathers and digestive tracks. It is possible to spend hours or even days weeding dandelions and clover off bigger green roofs. However, they provide valuable forage for bees and other insects in the middle of the city and look great. Simply deadheading them after the flowers have died is an easy practice that keeps unattractive dead growth off the roof. The same applies to a multitude of other plants that show up on the green roof which adds depth and character to sedum canvasses. However, when it comes to plants that can harm the building envelope such as tree seedlings or blackberry bushes then the choice is clear to remove them.

-Keep Drains Clear: Clogged drains represent a major risk during rainstorms. Ensure that drains and vegetation-free zones are kept clear of debris such as rocks, plant overgrowth, and leaves.

-Stay on Top of Irrigation: In the Pacific Northwest, we frequently experience extremely wet winter/ early spring and extremely dry summer/early fall seasons. Being ahead of the game and tuning your irrigation to be in line with the seasons can mean the difference between a healthy green roof or one that struggles with too much or not enough moisture.

-Week 0-2: Irrigate 1-2 times per day, keep the plugs/sedums and surrounding area evenly moist.

-Week 3-4: Irrigate 1-2 times per week. More roots form, most varieties root into media.

-Week 5-8: Irrigate 1 time per week. All varieties should have roots formed with most rooting into media.

-Week 9 & beyond: Irrigate every 1-2 weeks depending upon how quickly you want the roof to fill-in.

-Remember to Winterize: Conditions in Coastal British Columbia can quickly go from mild to freezing with little notice. Make sure to be well ahead of the winterization schedule and ensure that the irrigation systems are correctly flushed of water. Failure to do so could mean costly remediation in the spring.

-Safety: Ensure that anyone who is visiting your green roof understands the risks. Everyone working on the green roof should be fall-protection certified. Any visitors to the green roof should be educated on the dangers of venturing too close to the edge.

-Fertilization: It is recommended to use an organic all-purpose fertilizer with a balanced phosphorus, nitrogen, potassium content. Because green roofs have a high likelihood of water runoff into sensitive waterways do not use chemical-based fertilizers. Furthermore, chemical fertilizers are becoming illegal for green roofs in some municipalities. At Architek we use concentrated seaweed-based fertilizers in both liquid and granular form. It will depend on the access of the roof which is most convenient for your green roof. We recommend fertilizing your green roof once or twice per year.



ARCHITEK ASSURED GREEN ROOFS

basic extensive

A cost effective approach for extensive green roof system, it is a light weight build up composed of a drainage board thinner than usual which can reduce the height of flashings and borders; Easiness on installation since drainage board and filter sheet are merged in one single layer. This system is designed for those green roofs that does not requires a significant amount of water retention but still performs in other sustainable aspects for the building. The basic extensive green roof can be installed in both types of roofs, conventional and inverted assemblies.

KEY FEATURES:

Cost savings: requires less time to install and very low maintenance involved;

Improved Performance: Increased thermal insulation.

Reduced Heat Island: Moderates temperature so rooftop equipment (including solar PV) operates more efficiently.

Increased Value: Enhances views, creates enjoyable outdoor space and provides habitat for nature.

Locally Sourced Materials: Architek uses mostly locally sourced materials.

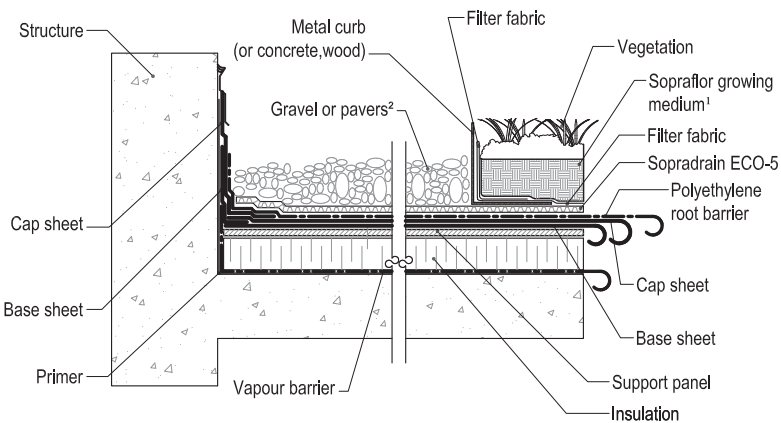
LEED Features: beyond Sustainable Sites (SS) and Water Efficiency (WE) some layers of this build up has recycled material content and can contribute to Materials & Resources categorie.



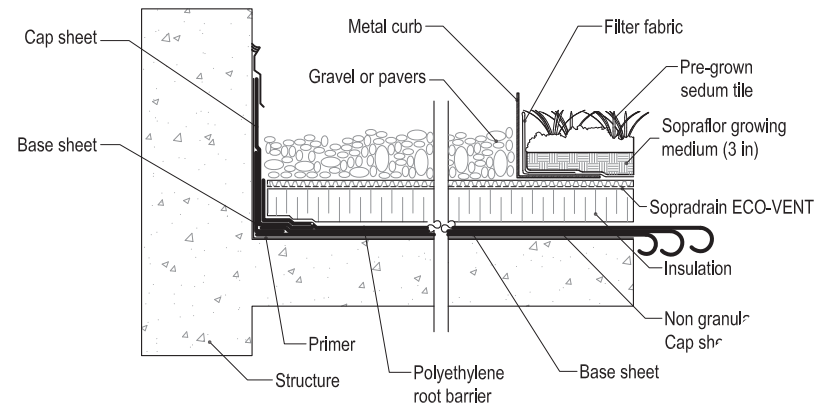
Drainage board for conventional roofs.



Drainage board for inverted roofs.



CONVENTIONAL ROOF ASSEMBLY - TYPICAL DETAIL



INVERTED ROOF ASSEMBLY - TYPICAL DETAIL



ARCHITEK ASSURED GREEN ROOFS

water retention + passive irrigation blue / green roof

High performance water retention and passive irrigation system build-up. Allowing for high levels of stormwater retention and reduction of water use for irrigation.

Blue / green roof that usually uses sedums or shallow root grasses. The soil or grow media/substrate layer is usually shallower than 150 mm or 6". The entire system has a saturated maximum weight of 183 l/m² as it may hold up to 116 liters of rain water per square meter.

KEY FEATURES:

Stormwater Management: Reduces the total volume and the rate of runoff, particularly during peak storm events.

Cost savings: Doubles roof life by protecting membrane from mechanical damage and UV exposure.

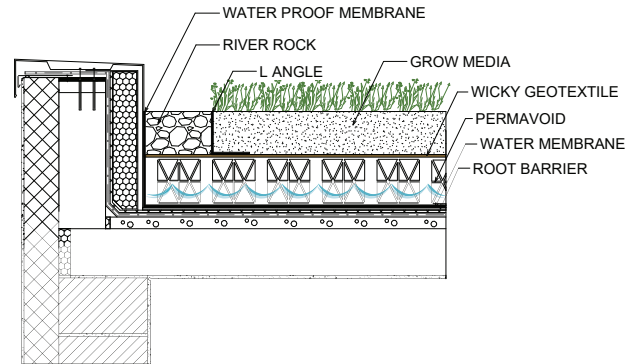
Improved Performance: Increased thermal insulation.

Reduced Heat Island: Moderates temperature so rooftop equipment (including solar PV) operates more efficiently.

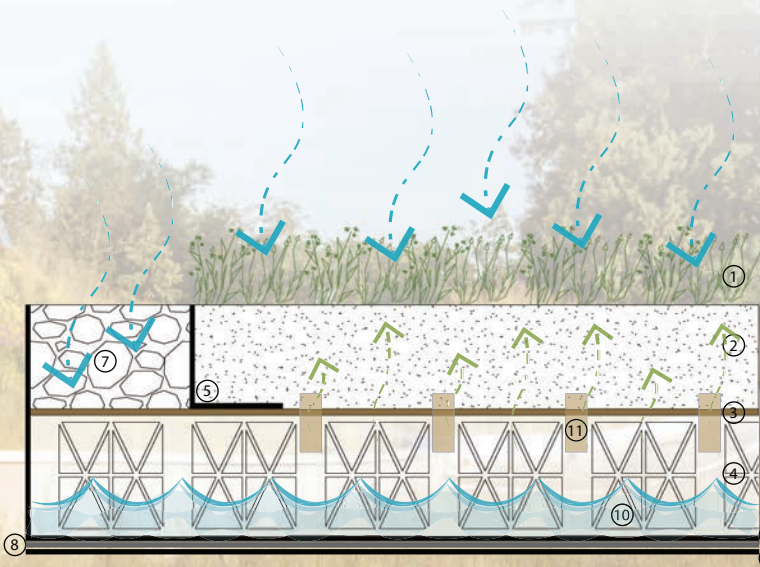
Increased Value: Enhances views, creates enjoyable outdoor space and provides habitat for nature.

Locally Sourced Materials: Architek uses mostly locally sourced materials.

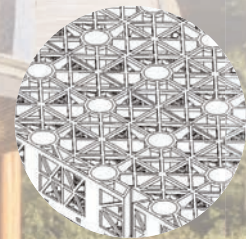
Irrigation Water Saving: Storm water storage and passive irrigation allow reduction in water usage for gardening.



Pre-grown vegetation mat.



- ① EXTENSIVE VEGETATION
- ② GROWN MEDIA
- ③ WICKY GEOTEXTILE
- ④ PERMAVOID
- ⑤ L ANGLE
- ⑥ WATERPROOFING MEMBRANE
- ⑦ RIVER ROCK
- ⑧ ROOT BARRIER
- ⑨ ROOF MEMBRANE
- ⑩ RAIN WATER STORAGE
- ⑪ WICKING CYLINDERS



Permavoid 85

Rooftop VanDusen Botanical Garden Visitor Centre, Vancouver, BC





ARCHITEK ASSURED GREEN ROOFS

extensive + water retention

Shallow, light weight green roof that usually use sedums or shallow root grasses. The soil or grow media/substrate layer is usually shallower than 150 mm or 6" and the entire system has a saturated weight of less than 25 lbs. per square foot, average being about 20 lbs. per square foot. Among many benefits this green roof system is a low maintenance roof that requires no irrigation or minimal depending on specific climate.

KEY FEATURES:

Stormwater Management: Reduces the total volume and the rate of runoff, particularly during peak storm events.

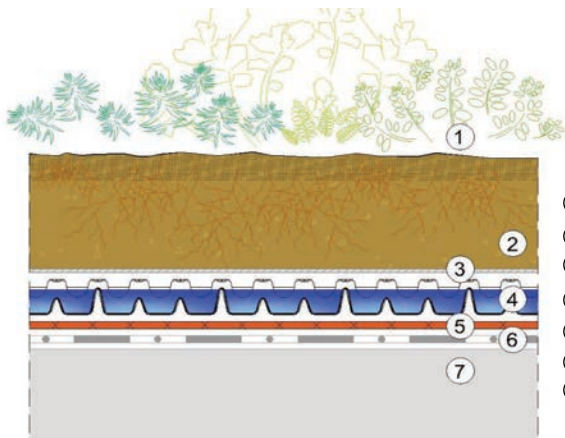
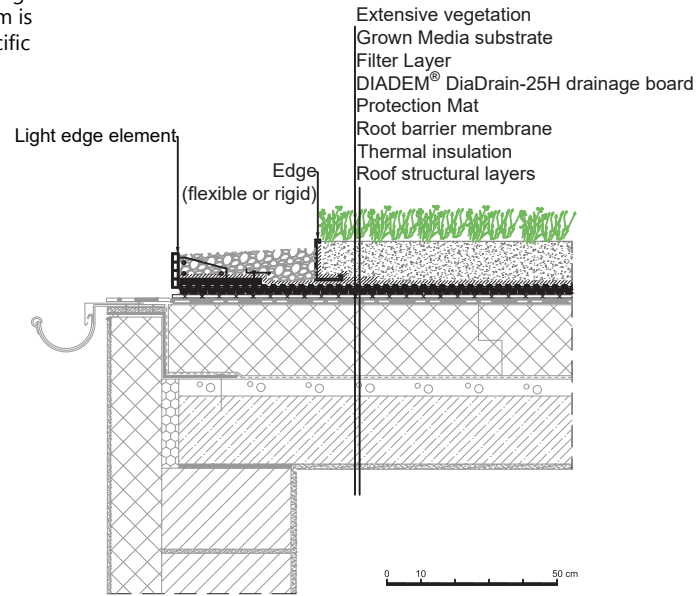
Cost savings: Doubles roof life by protecting membrane from mechanical damage and UV exposure.

Improved Performance: Increased thermal insulation.

Reduced Heat Island: Moderates temperature so rooftop equipment (including solar PV) operates more efficiently.

Increased Value: Enhances views, creates enjoyable outdoor space and provides habitat for nature.

Locally Sourced Materials: Architek uses mostly locally sourced materials.



Pre-grown vegetation mat.



DiaDrain-25H drainage board





ARCHITEK ASSURED GREEN ROOFS

semi-intensive

Medium depth, green roofs that usually use more substantial grasses, perennials or smaller shrubs. The soil or grow media/substrate layer is usually 150mm to 300 mm or 6-12" and the entire system has a saturated weight of less than 40 lbs. per square foot, average being about 30 lbs. per square foot. In addition to the usual ecological benefits this type of construction has the added value of providing additional valuable space for recreational use.



DIADRAIN-40H

KEY FEATURES:

Suitable for everyday use;

Increased property value;

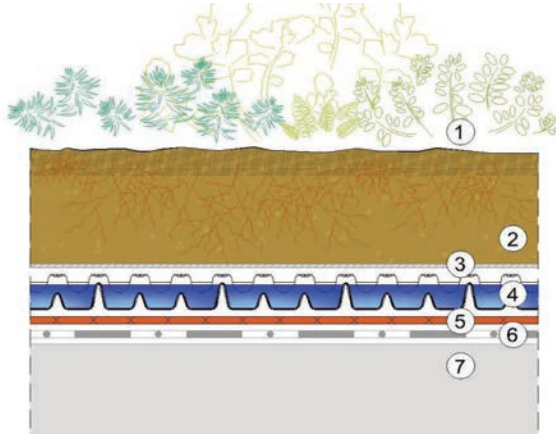
Better use of available space;

Wide range of possible designs;

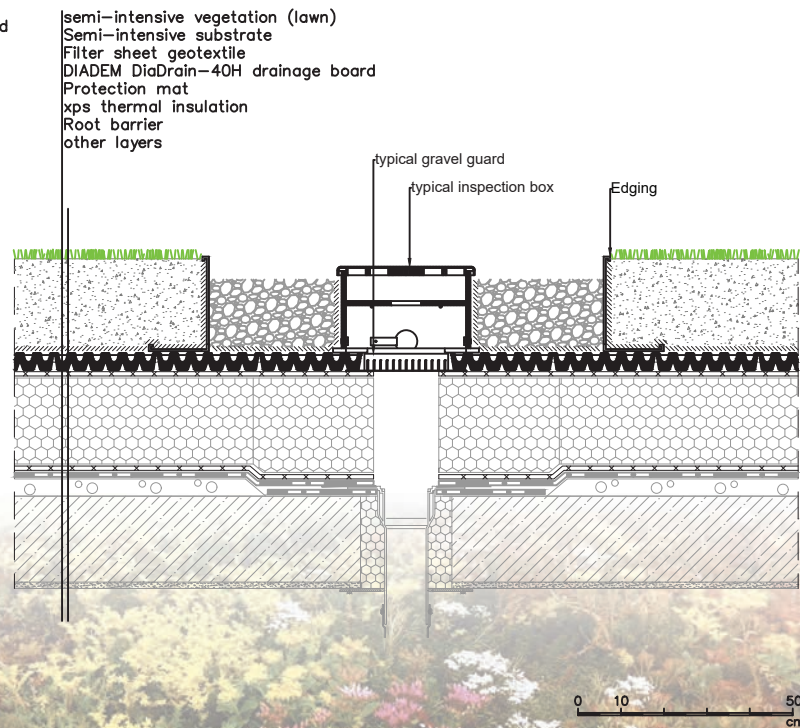
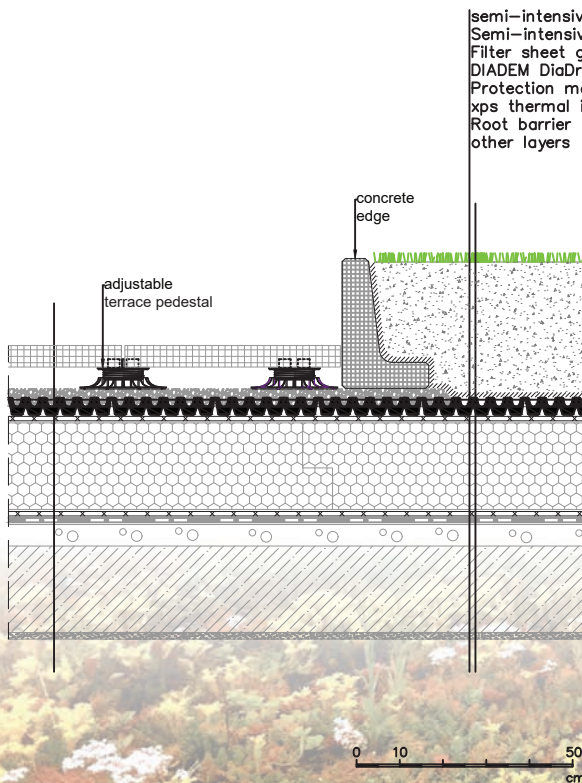
Relatively low investment cost;

Improved thermal efficiency;

Technically sound;



- ① EXTENSIVE VEGETATION
- ② GROWN MEDIA
- ③ DIADEM VLF 150;200 FILTER LAYER
- ④ DIADRAIN-40H
- ⑤ DIADEM VLU 300/500 MECHANICAL PROTECTION LAYER
- ⑥ ROOT RESISTANT WATERPROOFING MEMBRANE
- ⑦ ROOF STRUCTURE/CONSTRUCTION



ARCHITEK ASSURED GREEN ROOFS

gentle slope

Sloped green roofs are extremely attractive and highly visible from the ground, however they have unique challenges and need to deal with erosion and shear forces due to gravity. The soil or grow media/substrate layer is usually 100mm to 200mm: 4-6" and the entire system has a saturated weight of less than 35 lbs. per square ft. - average being about 50 lbs.per square foot.



DIADEEM-40H

KEY FEATURES:

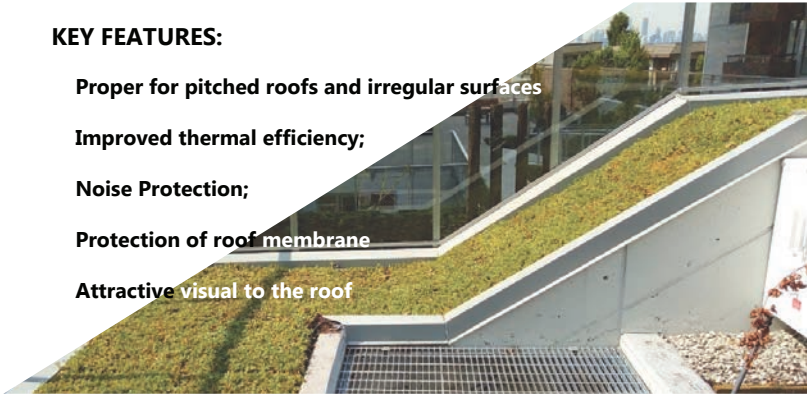
Proper for pitched roofs and irregular surfaces

Improved thermal efficiency;

Noise Protection;

Protection of roof membrane

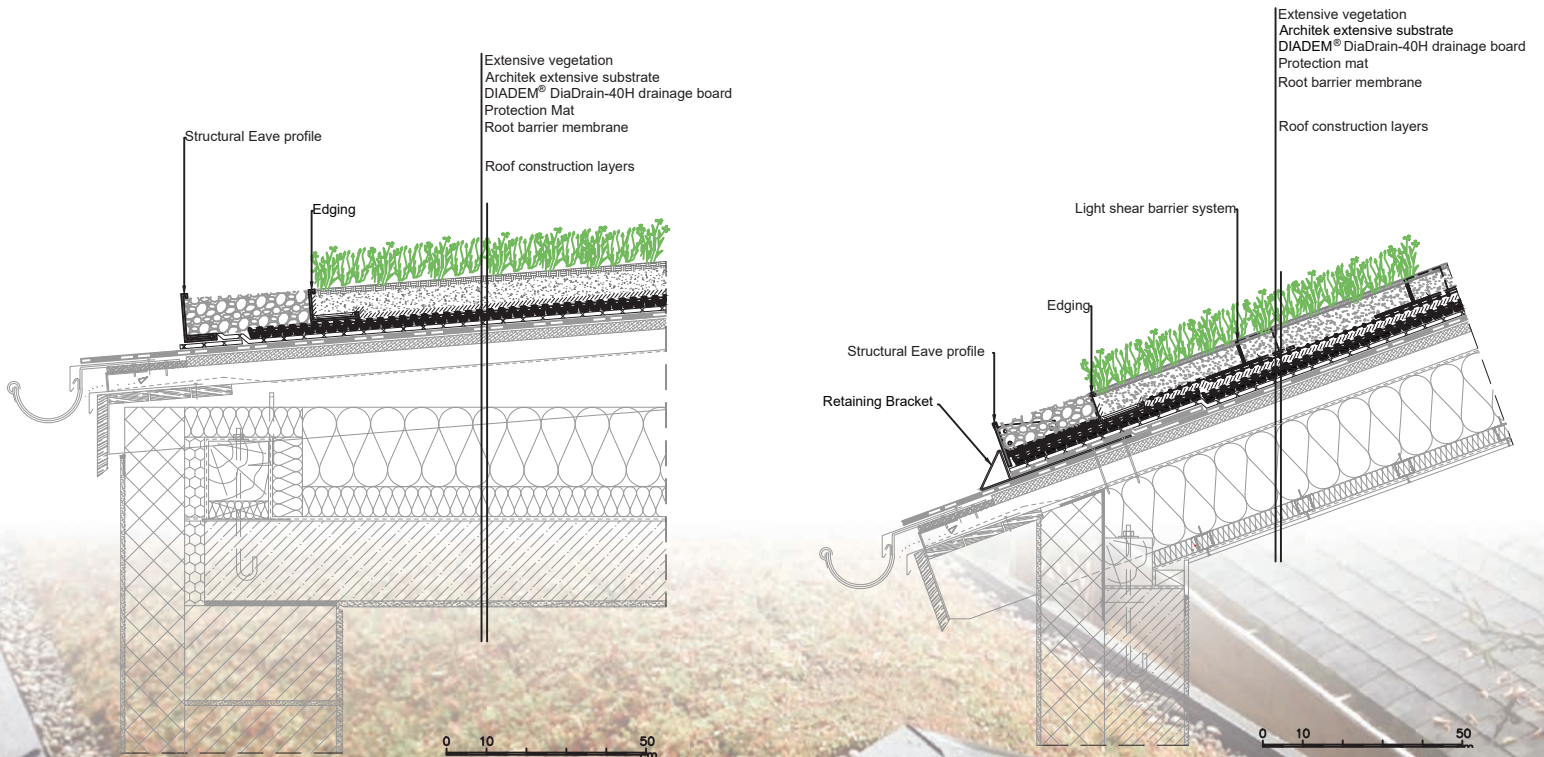
Attractive visual to the roof



ONE SIXTY MULTI-RESIDENTIAL - NORTH VANCOUVER BC



VANDUSEN BOTANICAL GARDEN - VANCOUVER BC



ARCHITEK ASSURED GREEN ROOFS
steep slope

Sloped green roofs are extremely attractive and highly visible from the ground, however they have unique challenges and need to deal with erosion and shear forces due to gravity. The soil or grow media/substrate layer is usually 75 mm due to the retention piece and 4-6" and the entire system has a saturated weight of less than 35 lbs. per square ft. - average being about 50 lbs. per square foot.



JABOB WEBNET APPLIED



JABOB WEBNET

KEY FEATURES:

- Proper for steep roof and surfaces;**
- Improved thermal efficiency;**
- Noise Protection;**
- Protection of roof membrane**
- Attractive visual to the roof**
- UV Protection**

Pre-planted modules for instant use

100% recycled material

Self-maintaining rainfall provides all water needs

Easy fit

Absorbs airborne particulates

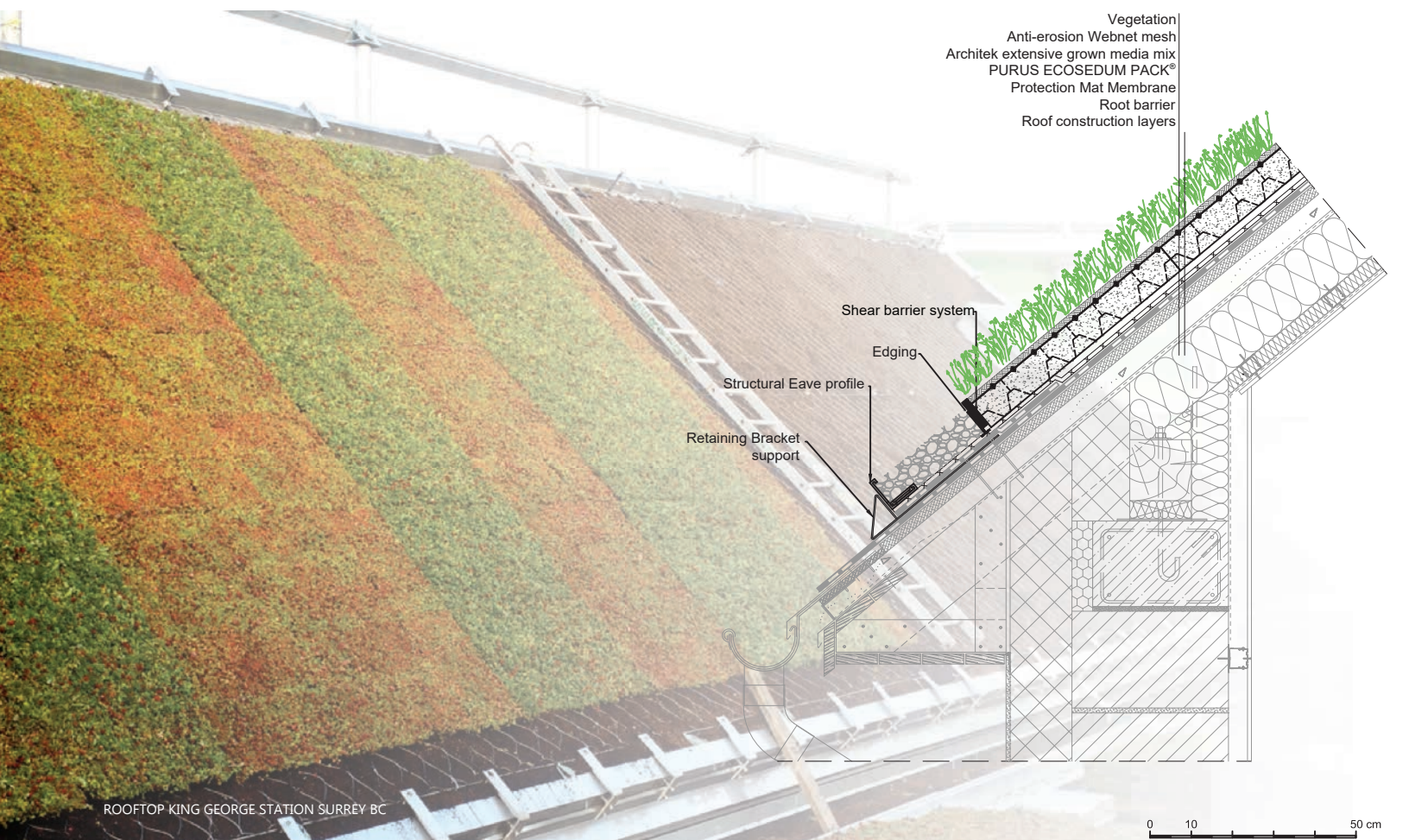
Helps extend roof life, e.g. by providing UV protection

Effective SUDS control thanks to rainwater attenuation



PURUS ECOSEDUM PACK

- Vegetation
- Anti-erosion Webnet mesh
- Architek extensive grown media mix
- PURUS ECOSEDUM PACK®
- Protection Mat Membrane
- Root barrier
- Roof construction layers



ROOFTOP KING GEORGE STATION SURREY BC





ARCHITEK

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