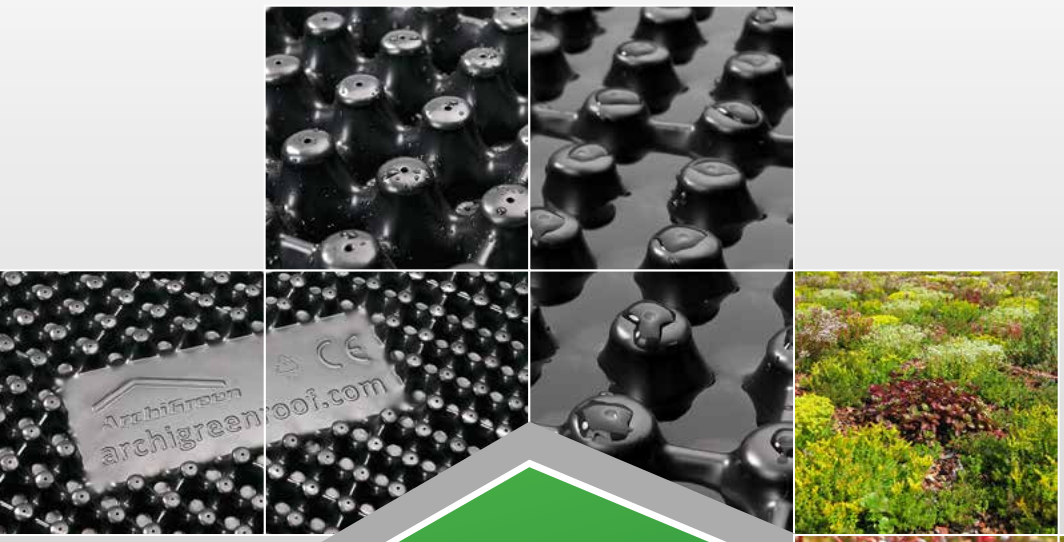
ArchiGreen®

Green roof catalogue



TESTED ▪ CERTIFIED ▪ WORKS

Welcome to the world of green roofs

Nature and technology

Two seemingly conflicting terms that largely influence our daily lives. In order to keep abreast of tecnological advances and enjoy the comfort that result from such progress, we may decide to move to crowded cities and settle there. However, after a while, the hustle and bustle of cities may seem unbearable to the extent that some of us may turn to nature for some tranquility and a breath of fresh air.

Day in day out city dwellers, especially of overpopulated cities, face growing environmental concerns including heat island effect and urban flash flooding (For further information on these topics please see page 20). In order to participate in the alleviation of such tensions, we at ArchiGreen Ltd develop, manufacture and sell green roof systems that have the benefits of mitigating summertime temperatures and also attenuating stormwater runoffs. ArchiGreen® green roof systems incorporating the SedumDrain® 25 water reservoir and drainage boards have been installed on many award winning buildings including the Green House (LEED Platinum award winner) in Budapest as well as The GSK Carbon Neutral Laboratories for Sustainable Chemistry (LEED Platinum and BREEAM Outstanding awards winner) in the University of Nottingham, England.

The global distribution network of ArchiGreen Ltd is continuously expanding since its establishment in 2011 owing to the outstanding quality of the products and their unmatched competetive prices.

What is a green roof?

Green roofs often referred to as vegetated roofs, eco-roofs, living roofs or planted roofs are rooftops where plants are used to enhance the roof's performance, it's appearence or both. Green roofs fall into one of two basic categories: The minimal maintenance extensive green roof providing an ecological carpet of drought resistant vegetation and the high maintenance intensive green roof providing a full natural garden-like experience.

Extensive green roofs

Extensive green roofs usually have a shallow substrate – the growing medium on green roofs – depth of 150 mm or less of coarse, mineral-based aggregate and are planted primarily with drought-tolerant herbaceous perennial plants and sedum species that are selected to suit the local conditions. For this reason, extensive green roofs are sometimes referred to as sedum roofs. This type of green roofs require regular irrigation and maintenance only in their initial phase of establishment but following their second summer these extremely sturdy plants should be able to get through drier periods quite well.

Once established, extensive green roofs require only minimal maintenance (2 to 3 times annually), limited to occasional weeding. They are not normally designed to provide access for leisure use but rather to provide a 'back to nature' look and offer strong ecological benefits. Owing to their lightweight, minimal maintenance and modest consruction costs, extensive green roofs are the most popular type of green roofs in Europe. Some urban developers believe if built on a large scale in cities, extensive green roofs can deliver significant energy savings and other environmental benefits that improve the quality of urban life.

PROMOTING NATURE WITH GREEN ROOFS!

Petz Aladár county teaching hospital

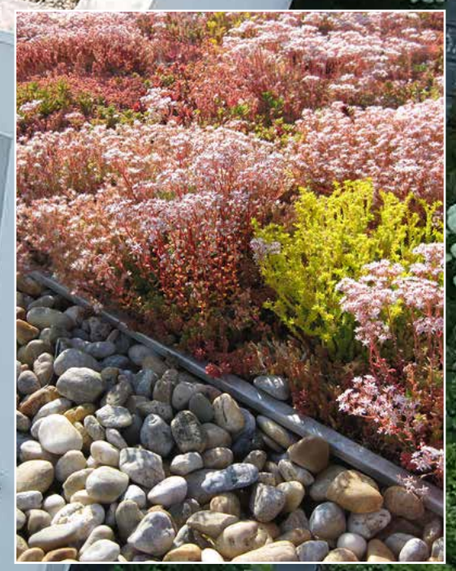
Healing environment

Summary	
Year of construction	2012
Location	Győr, Hungary
Type of green roof	120 m^2 of extensive green roof (plug planting and broadcast of sedum cuttings)
ArchiGreen® products installed	SL-I 125 separation layer for inverted roofs • SedumDrain® 25 water retention and runoff-delay drainage boards • FL 150 filter layer • IC-S 150 inspection chambers • SP-C AL 120/80 prefabricated ballast retention corner pieces • SDS engineered substrate for extensive green roofs

Győr - Detached house

We love promoting nature

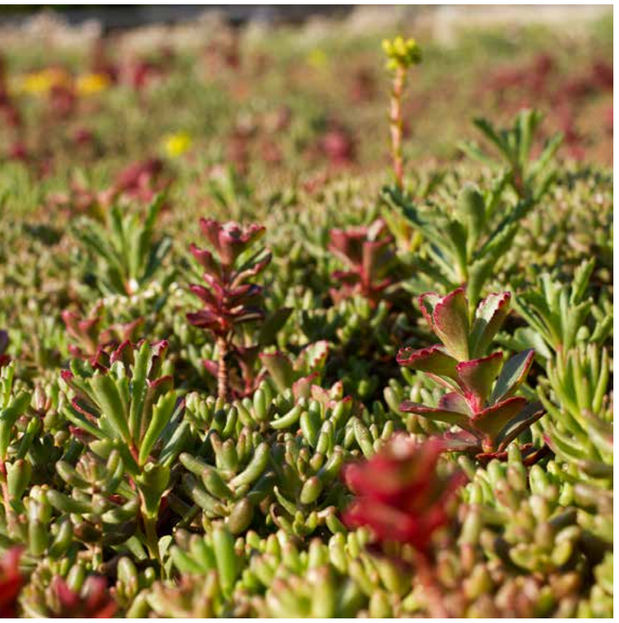
Summary	
Year of construction	2013
Location	Győr, Hungary
Type of green roof	126 m² of extensive green roof (pre-vegetated sedum mat)
ArchiGreen® products installed	PL 300 protection layer • SedumDrain® 25 water retention and runoff-delay drainage boards • FL 150 filter layer • IC-S 100 inspection chambers • SP-AL 120/80 prefabricated ballast retention trims • SP-C AL 120/80 prefabricated ballast retention corner pieces •SDS engineered substrate for extensive green roofs



Győr - Multi-storey townhouse

City centre

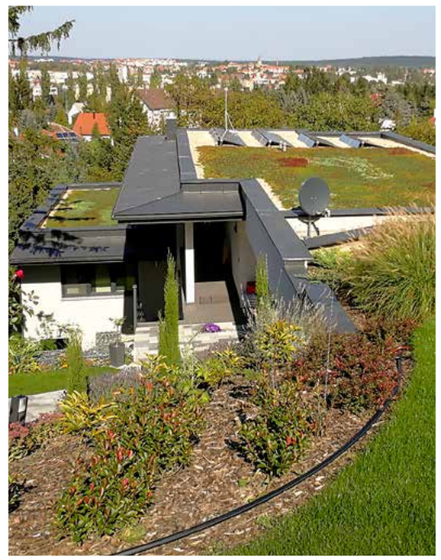
Summary	
Year of construction	2016
Location	Győr, Hungary
Type of green roof	130 m² of extensive green roof (sedum cuttings were broadcast over the substrate.)
ArchiGreen® products installed	PL 300 protection layer • SedumDrain® 25 water retention and runoff-delay drainage boards • FL 150 filter layer • IC-P 100 inspection chambers, near parapets • SP AL 120/80 prefabricated ballast retention trims • SP-C AL 120/80 prefabricated ballast retention corner pieces • SDS engineered substrate for extensive green roofs



Sopron - Detached house

A perfect fit

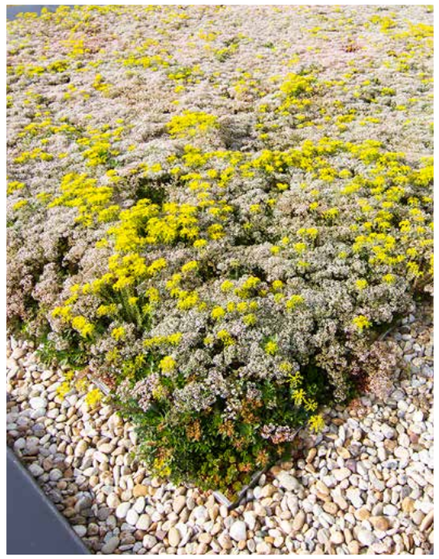
Summary	
Year of construction	2016
Location	Sopron, Hungary
Type of green roof	120 m² of extensive green roof (pre-vegetated sedum mat)
ArchiGreen® products installed	PL 300 protection layer • SedumDrain® 25 water retention and runoff-delay drainage boards • FL 150 filter layer • IC-P 100 inspection chambers, near parapets • SP AL 120/80 prefabricated ballast retention trims • SP-C AL 120/80 prefabricated ballast retention corner pieces • SDS engineered substrate for extensive green roofs



Feketeerdő - Detached house

Sustainability and minimalism blend well

Summary	
Year of construction	2016
Location	Feketeerdő, Hungary
Type of green roof	770 m² of extensive green roof (sedum cuttings were broadcast over the engineered substrate.)
ArchiGreen® products installed	PL 300 protection layer • SedumDrain® 25 water retention and runoff-delay drainage boards • FL 150 filter layer • IC-P 100 inspection chambers, near parapets • SP AL 120/80 prefabricated ballast retention trims • SP-C AL 120/80 prefabricated ballast retention corner pieces • SDS engineered substrate for extensive green roofs



Győr - Garage rooftop

Plants all around

Summary	
Year of construction	2014
Location	Győr, Hungary
Type of green roof	68 m^2 of extensive green roof (pre-vegetated sedum mat)
ArchiGreen® products installed	PL 300 protection layer • SedumDrain® 25 water retention and runoff-delay drainage boards • FL 150 filter layer • IC-S 100 inspection chambers • SP-C AL 120/80 prefabricated ballast retention corner pieces SDS engineered substrate for extensive green roofs

The role of green roofs in urban development

Urban flash flooding

Sudden intense, torrential rains known as flash floods are becoming more common. Handling such large volumes of precipitation in a well preserved natural environment is easily solved by nature since a significant portion of the water is absorbed and consumed by the vegetation, whereas the rest is percolated into the ground and stored as groundwater. However, in an urban setting, both permeable surfaces where water can freely drain and natural plants are scarcely available. Moreover, many cities are ill-equipped to deal with these uprecedented amounts of precipitation due to their insufficient and outdated stormwater infrastructure. Consequenly, the amount of stormwater in the sewer pipes can easily reach capacity and overflow onto the impervious street surfaces wreaking havoc. Urban developers were quick to recognise the significant role that green roofs can play in mitigating flash-flood disasters due to the following factors:

- a significant proportion of the rainfall is stored by the vegetation and the layers of the green roof
- excess water is released into the sewer system with significant delay in a process known as horizontal detention. (For further information please see page 33 under 'Operational Principle')
- effectively filters the runoff from a lot of contaminating particles

Changing existing impervious ground surfaces to permeable ones or establishing special stormwater storage units or perhaps even establishing a systematic method of implementing new green fields in cities are some of the challenges that urban developers may have to solve in the long-run.

Meanwhile, green roofs can perfectly fit on the already established urban constructions, thereby capitalising on the benefits of green roofs on unprotected roof membranes.

Urban heat island

An urban heat island (UHI) is an urban area that is significantly warmer than its surrounding rural areas. The basic materials commonly used in urban areas for pavement and roofs, such as concrete and asphalt, have significantly different thermal bulk properties and surface radiative properties than the surrounding rural areas. This causes a change in the energy budget of the urban area, often leading to higher temperatures than surrounding rural areas. Another major reason is the lack of evapotranspiration (for example, through lack of vegetation) in urban areas. Other causes of a UHI are due to geometric effects. The tall buildings within many urban areas provide multiple surfaces for the reflection and absorption of sunlight, increasing the efficiency with which urban areas are heated. This is called the «urban canyon effect». Another effect of buildings is the blocking of wind, which also inhibits cooling and prevents pollutants from dissipating. Waste heat from automobiles, air conditioning, industry, and other sources also contributes to the UHI. High levels of pollution in urban areas can also increase the UHI, as many forms of pollution change the radiative properties of the atmosphere. A meaningful method of mitigating the urban heat island effect in cities is through the construction of professional green roofs on a large scale.

Intensive green roofs

Intensive green roofs can function as natural gardens providing access for recreational use as well as providing an appealing sustainable design element on a rooftop. With their unrvalled appearance ArchiGreen® intensive green roofs can help in generating a unique vibe when merged with a roof terrace, a swimming pool, a pitch or a restaurant. Intensive green roofs, commonly referred to as roof gardens, are full-fledged gardens with at least a depth of 300 mm build-up installed often on underground parking lots.

The depth of the engineered substrate is determined by the range of species to be planted and the load-bearing capacity of the roof deck. Intensive green roofs require regular irrigation and high maintenance to preserve their grandeur and longevity.

Owing to the above, the depth of the build-up of an intensive green roof varies largely from build-up to build-up in line with the load bearing capacity of the roof deck plus the function and landscape design of the roof garden.

PROMOTING NATURE WITH GREEN ROOFS!

Budapest - Office Complex

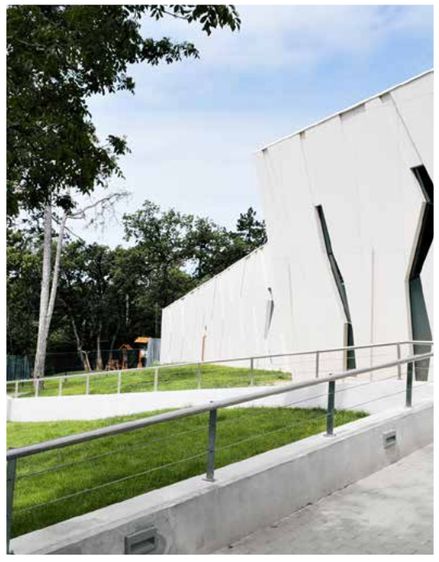
Creative environment

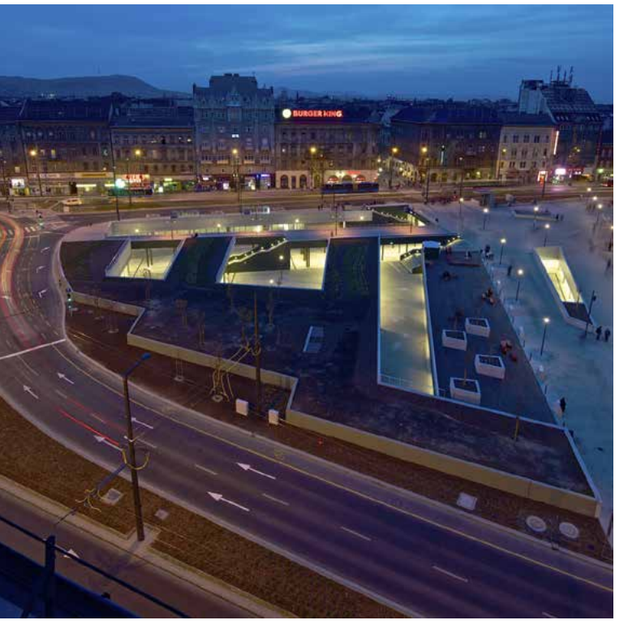
Summary	
Year of construction	2012
Location	Budapest, Hungary
Type of green roof	3700 m^2 of intensive and extensive green roof (lawn carpet, shrubs, large perennials, wildflowers)
ArchiGreen® products installed	SL-I 125 separation layer for inverted roofs • SedumDrain® 25 water retention and runoff-delay drainage boards • FL 200 filter layer • IC-S 100 inspection chambers • SP-AL 120/80 prefabricated ballast retention trims • SP-C AL 120/80 prefabricated ballast retention corner pieces

Pécs - Zoological garden

Green wildlife

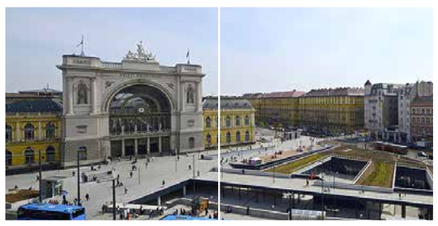
Summary	
Year of construction	2015
Location	Pécs, Hungary
Type of green roof	600 m^2 of intensive green roof (lawn carpet)
ArchiGreen® products installed	PL 500 protection layer • SedumDrain® 25 water retention and runoff-delay drainage boards • FL 200 filter layer • IC-S 700 inspection chambers





Budapest - Keleti Railway Station

Sustainable urban meeting point

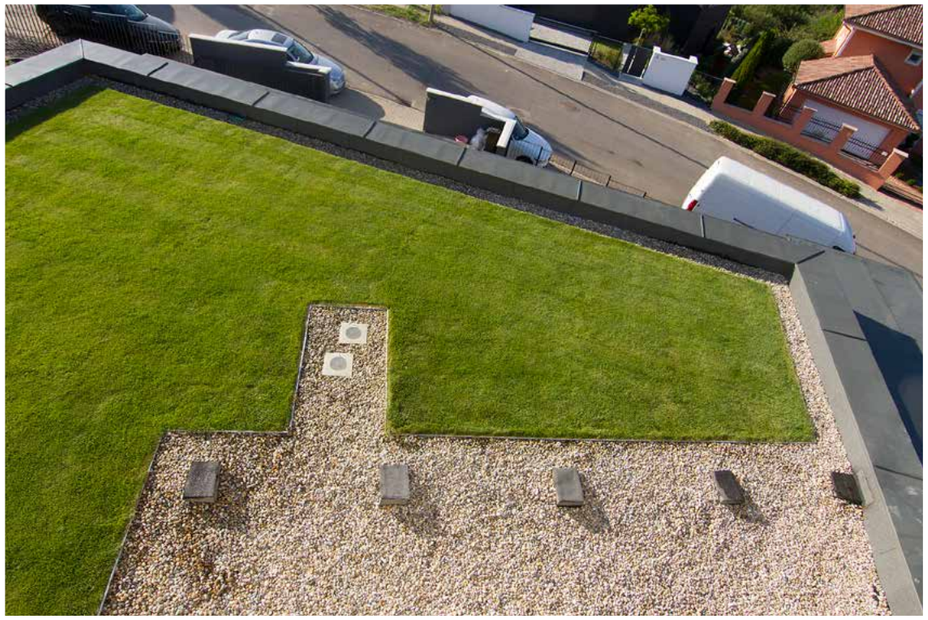


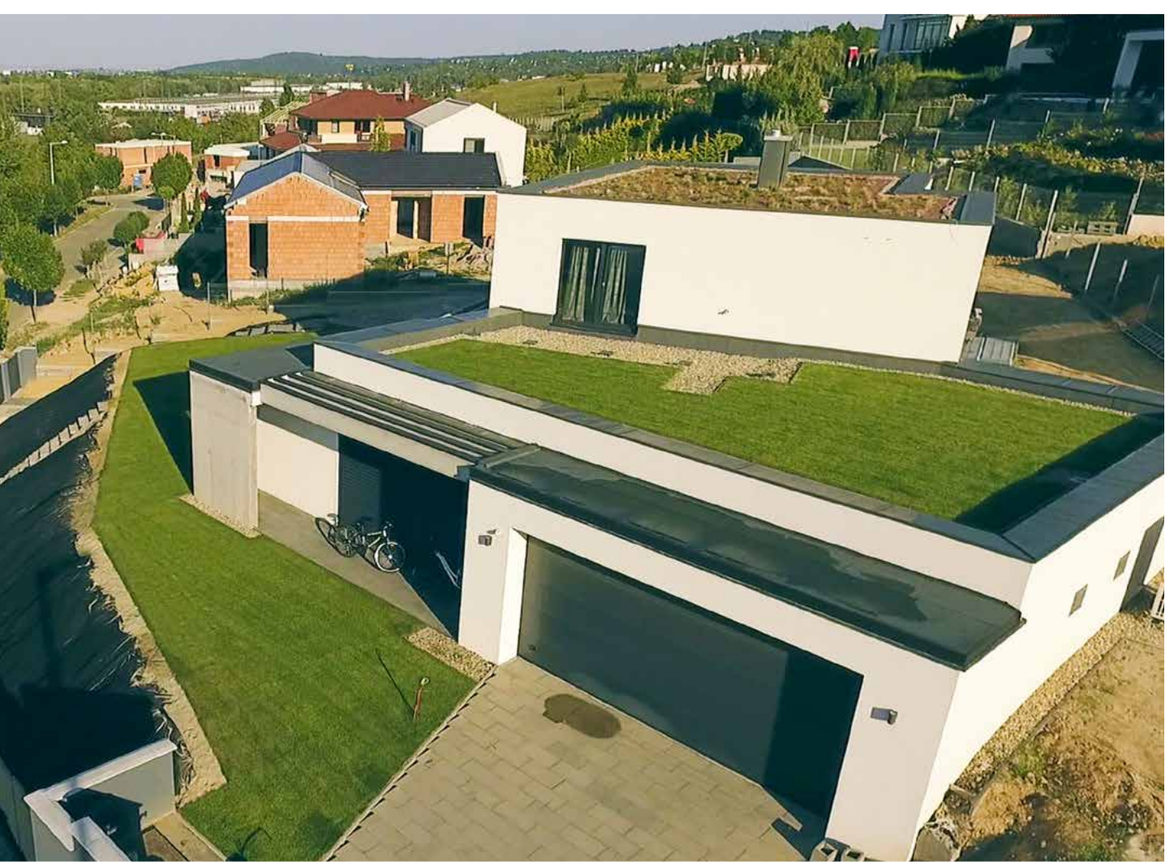
Summary	
Year of construction	2013
Location	Budapest, Hungary
Type of green roof	1200 m² of intensive green roof (lawn carpet and shrubs)
ArchiGreen® products installed	SedumDrain® 25 water retention and runoff-delay drainage boards • FL 200 filter layer

Budapest - Office Complex

Neatness at the workplace

Summary	
Year of construction	2011
Location	Budapest, Hungary
Type of green roof	90 m² of intesive green roof (turf and shrubs) 40 m² of extensive green roof (sedum plug plants)
ArchiGreen® products installed	PL 500 protection layer • SedumDrain® 25 water retention and runoff-delay drainage boards • FL 200 filter layer • IC-S inspetion chambers • SP-AL 120/80 prefabricated ballast retention trims • SP-C AL 120/80 prefabricated ballast retention corner pieces





Törökbálint - Detached house

Maximising green space

Summary	
Year of construction	2017
Location	Törökbálint, Hungary
Type of green roof	70 m² of intensive green roof (lawn carpet) 40 m² extensive green roof (sedum plug plants)
ArchiGreen® products installed	PL 300 rrotection layer • SedumDrain® 25 water retention and runoff-delay drainage boards • FL 150 filter layer • IC-S 100 inspection chambers • SP-AL 120/80 prefabricated ballast retention trims • SP-C AL 120/80 prefabricated ballast retention corner pieces

Technological description

Benefits of green roofs

- Improvement of air quality
- Production of oxygen

- Enhancement of climatic conditions
- Protection of both the waterproofing and thermal insulation from climate extremes, UV exposure and mechanical damage

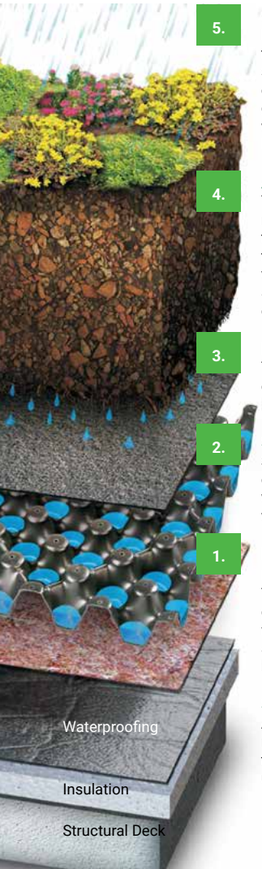
- Reduction in reflective sound and improvement in both sound and thermal insulation properties

- Improves the building's energy performance

- Increase in stormwater retention and runoff-delay properties
- Economical advantages - Environmentally conscious construction with sustainability in mind

- Creation of wildlife habitat in urban areas by hosting the appropriate vegetation types
- Providing a tool that enables buildings to blend in with their surrounding landscapes

The ArchiGreen® build-up for green roofs



5. Carefully selected vegtation
In the case of an extensive green roof, drought-tolerant herbaceous perennial plants and sedum species are selected to suit the local conditions; whereas in the case of an intensive green roof, depending on the depth of the buid-up, a wide variety of plants can be selected ranging from lawn, shrubs to small deciduous trees and conifers.

4. ArchiGreen® SDS / TDS substrate
These are specially engineered lightweight green roof media with minimum compressibility to create the ideal setting for each type of green roof. Among the properties of these media are: proper pH values, outstanding and consistent drainage and aeration, sufficient water retention capacity and excellent long-term performance and permeability.

3. FL 150 / FL 200 black-coloured filter layer
The pore size of these CE certified filter layers are chosen in such way that fine particles are retained but water and air circulation is unrestricted.

2. SedumDrain® 25 drainage and reservoir layer
Specially developed for green roofs, this CE certified drainage board drains away excess water to the outlets while retianing sufficient water for the plants during dry periods.

1. PL 300 / PL 500 multi-coloured protection layer
The GRK3/GRK4 robustness class protection mats guard the root barrier or the root-resistant waterproofing from mechanical damage.Moreover, these mats also absorb a portion of the excess water that they release back to the plants through diffusion during dry periods.

Support
A root-resistant waterproofing separates the living roof system from the insulated building below. (If the waterproofing is not root-resistant then the use of the ArchiGreen® RB root barrier is advised.)

1. Protection and separation of the waterproofing

PL 300 protection layer
In accordance with the FLL guidelines, the protection mat, in the case of an extensive green roof build-up, must weigh at least 300 g/m² to properly guard the waterproofing. The PL 300 protection mat is thermally treated on both sides with a robustness class of GRK3 to protect the root barrier or the root-resistant waterproofing from mechanical damage. Moreover, these mats also absorb a portion of the excess water that they release afterwards to the plants in a process known as diffusion during dry periods. (For further information on the technical data of these mats please see page 34)

PL 500 protection layer
In the case of an intensive green roof build-up, the protection mat has to have a higher puncture resistance. Therefore, the use of PL 500 with a surface weight of 500 g/m² and a robustness class of GRK 4 is advised in this case.

SL-I 125 separation layer for inverted roofs
In the case of an inverted roof build-up, a separation sheet – with a surface weight of 125g/m² and high permeability properties – is rolled out over the closed cell thermal insulation seperating it from the rest of the green roof build-up while contributing to the proper aeration of the whole system.

The general ArchiGreen® green roof build-up section on the left side of the page is shown for illustrative purposes only.

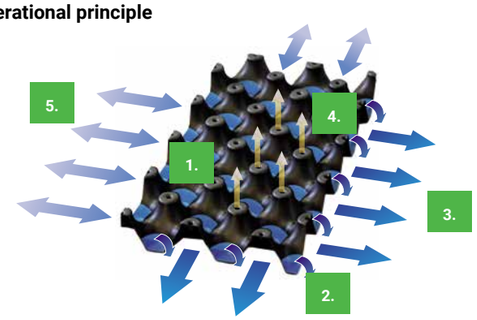
2. Water retention and drainage layer

SedumDrain® 25 water reservoir and drainage board
A great advantage of green roofs is their huge water retention capacity. Owing to the specially engineered green roof substrate (in accordance with the FLL guidelines at least 35%) and the high water retention capacity of SedumDrain® 25 drainage board (more than 10 l/m²) ArchiGreen® green roofs are capable of storing more than 30 litres per square metre with a build-up of only 120 mm depth. Thus ArchiGreen® green roofs capitalise dearly on stormwater reducing water run-off by up to 90 % in some cases and delaying the water that flows off from the roof – contributing to the reduction of the negative consequences caused by urban flash floods – while using up the retained precipitation in improving the microclimate on rooftops in urban cities. Drainage boards specially developed for green roofs differ from regular drainage boards on the market in that they are thermoformed on both sides and also in that they possess good drainage properties besides their high water retention capacity.

The double-sided SedumDrain® 25 board, owing to its two-plane channeling feature, ensures the flow of the water, that is not retained by the substrate, over its upper plane from one board to the other. In the case of larger amounts of rainfall, excess water percolates between the joint gaps of adjacent boards to the protection and waterproofing layers in which case the lower plane of the board channels away the excess water to the outlet contributing to the prevention of waterlogging in the build-up. In the case of an extensive green roof the emphasis is more on the retention properties of the drainage board in order to ensure sufficient water uptake by the plants in dry periods; as opposed to the case of a regularly irrigated intensive green roof where the empahsis is on the drainage properties rather than the retention properties of the drainage board.

Technical data	
Material: Recycled high imapact polystyrene (HIPS)	
Height	25 mm
Board size / area	1.915 x 0.96 m / 1.838 m²
Mass (empty)	1.36 kg /m²
Diffusion perforation	2 mm
Water retention capacity	10.1 l/m²
Filling volume (filled with substrate)	12.2 l/m²
Maximum compressive strength EN ISO802:1995	
Empty	434 kN /m²
Infilled (grain size 4-8mm)	> 500 kN /m²
Horizontal water discharge capacity ENISO12958 at 20 kPa	
i = 0.001 (1% fall)	0.80 l / (m • s)
i = 0.002 (2% fall)	1.40 l / (m • s)
i = 0.003 (3% fall)	1.85 l / (m • s)
i = 1	15.38 l / (m • s)
Rate of drainage through perforations	
Under 5 mm permanent water pressure	0.092 l / (m² • s)

Operational principle



1. A good green roof substrate will act as a buffer in the case of urban flash flooding and will absorb water to the point it gets saturated thereby, mitigating stormwater runoff. This is referred to as vertical detention.
2. When a precipitation retention cell is filled, excess water flows over the brim of the cell to the adjacent cells and this process continues until the waterflow reaches the edges of the drainage and reservoir board. The waterflow then crosses the edges of the board flowing over to the adjoining boards all the way to the outlets. This is known as horizontal detention.
3. During times of torrential rains or prolonged rainfalls, water may leak between the overlapping gaps formed by the overlapping corrugations at the edges of the board to the PL protection layer beneath the drainage board.
4. As the drainage layer dries out through vegetation usage and evaporation, the damp PL protection mat releases its moisture gradually through the diffusion openings helping to keep the substrate moist.
5. Jointly with the diffusion openings, the bottom channel system of the drainage and reservoir layer ensure the aeration of the root space preventing it from getting stuffy.

3. Separation of the substrate

FL 150 filter sheet
This filter sheet inhibits the leaching of fine particles from the substrate into the drainage layer thereby preventing any reduction in the drainage properties of the double-sided SedumDrain® 25. It is made of rot-proof polypropylene fibres. Among the properties of this filter sheet are: high permeability, proper pore size, rot resistance, durability and long-term performance.

FL 200 filter sheet
The thicker 200g/m² filter sheet is incorporated in the build-ups of intensive green roofs.

	PL 300 Protection layer	PL 500 Protection layer	SL-I 125 Separation layer	FL 150 Filter layer	FL 200 Filter layer
Material	100% synthetic fibres		Virgin polypropylene		
Weight per unit area (g/m^2) EN ISO 9864	300	500	125	150	200
Thermal treatment	Treated on both sides	Treated on both sides	Treated on both sides	Non-treated	Non-treated
Robustness class (GRK)	3	4	2	3	3
Tensile strength warp (MD) (kN/m^2) EN ISO 10319	6	10	10	10.3	15
Tensile strength weft (CMD) (kN/m^2) EN ISO 10319	7	15	10	10.3	15
Elongation at break warp (MD) (%) EN ISO 10319	45	45	40	45	60
Elongation at break weft (CMD) (%) EN ISO 10319	40	40	45	55	60
Static puncture – CBR test (kN) EN ISO 12236	1.5	3	1.6	1.7	2.9
Pore size O_{90} EN ISO 12956	0.078	0.079	0.09	0.11	0.1
Water permeability (l/m^2*s) VIH_{50} EN ISO 11058	80	80	100	100	80
Roll dimensions Width / Length / Area	2/50/100	2/50/100	2/100/200	2/100/200	2/100/200
Gross weight (complete roll) (kg)	32	52	32	31	41

4. Engineered substrate

SDS substrate for extensive green roofs / TDS substrate for intensive green roofs
The growing environment on a roof differs from the plant's natural environment on the ground owing to the lack of subsoil on the roof and a lack in natural soil looseners (insects, worms etc). Growing medium on green roofs (often referred to as substrate) is discussed in the FLL* guidelines' section under "vegetation support course". This section includes helpful information on granulometric distribution (grain size), pH value, compaction resistance, water permeability and other properties that a green roof substrate must possess in order to provide an ideal basis for a healthy and permanent plant growth. It is worth noting that green roof substrate is not equivalent to topsoil which is the reason that extensive green roofs require minimal maintenance due to the low organic content of the SDS substrate (approx. 50 g/l). In other words, owing to this low organic mineral based aggregate know as substrate the spread of weed and the rise of waterlogged areas are kept at bay on an ArchiGreen® extensive green roof.

Properties	SDS substrate for extensive green roofs	TDS substrate for intensive green roofs
Saturated mass	ca. 1250 kg/m^3	ca. 1500 kg/m^3
Grain size	max. 12 mm	max. 16 mm
Water permeability	min. 0.001 cm/s, ill. 0.6 mm/min	min. 0.0005 cm/s, ill. 0.3 mm/min
Water retention / max. water capacity	min. 35 vol. % max. 65 vol. %	min. 45 vol.% max. 65 vol. %
Mud portion (d>0.063 mm)	max. 15 m %	max. 20 m %
Air content / max. water capacity	min. 25 vol. % / min. 10%	min. 20 vol. % / min. 10%
pH value	7 - 8	7-8.5
Organic content	max. 50 g/l	max. 300 g/l

On the other hand, the substrate of an intensive green roof will contain a great deal more organic matter (approx. 300 g/l) than its extensive counterpart discussed above to support a wide variety of plants and even trees. Substrate depth can range from 150 – 1500 mm on an intensive green roof versus a shallow substrate depth of 50 – 150 mm in an extensive green roof build-up.

Waterflow and inspection of the outlets

Inspection chambers within the planted area (IC-S) / near the parapet (IC-P)
According to the FLL guidelines, regardless of the size of the roof surface, roofs with drainage facilities located within the vegetation area must have at least one outlet and at least one emergency overflow. The emergency overflow may penetrate the parapet wall / facade. The emergency overflow which is a gutter running through the facade serves as a visual detector in pointing out any possible failure of the drainage system. "As a rule, roof outlets should be located away from vegetation areas and free from gravel. Where roof outlets are located within vegetation areas an inspection shaft will need to be installed, to allow inspections to be carried out, to prevent contamination and to stop plants from growing over the outlet." – FLL guidelines. Upon installing the IC inspection chambers, it is advised to form around them a 300 to 500 mm wide gravel strips in which case the depth of a gravel strip matches that of its surrounding substrate.

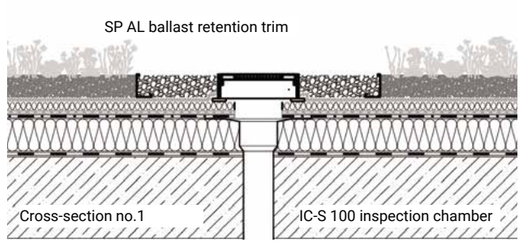
IC-S 100 inspection chamber (Cross-section no. 1)

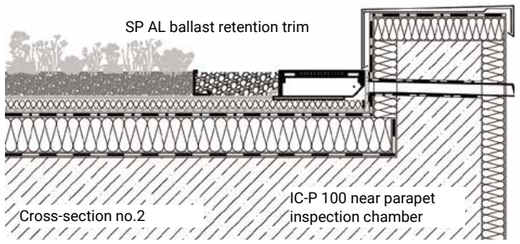
IC-P 100 near parapet inspection chamber (Cross-section no. 2)

IC-EX 50 / IC-EX 100 extension elements
Inspection chambers can be produced up to any height below 1,200 mm at the customer's request. However, with the aid of the 50 and 100 mm prefabricated IC-EX extension elements the height of the already installed inspection chambers can also be adjusted to fit flush into their surroundigs.

IC-EX 50 extension element for inspection chamber

IC-S extensive and intensive inspection chambers



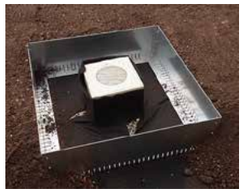


* FLL (Forschungsgesellschaft Landschaftsentwicklung Landschaftsbau e.V) is the German based Landscaping and Landscape Development Research Society located in Bonn, which is currently the recognised European voice for green roof standards. www.fll.de

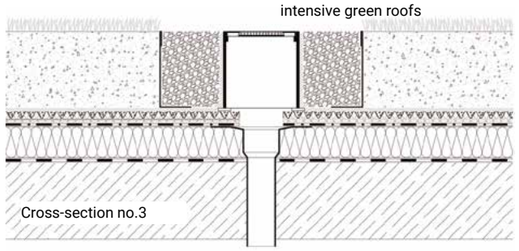
Edge-pieces

SP AL aluminium and SP GS steel retention trims
In a green roof setting, the 300 to 500 mm wide gravel strips composed of washed river pebble (16 to 32 mm diameter) installed along the edge of the roof and round the roof penetrations provide fast drainage of surface water into the drainage layer. Other important functions of gravel strips include: aeration of the drainage system at the edges, keeping rainwater and vegetation away from the building's structure, providing protection against wind suction, fulfilling fire prevention regulations and functioning as traffic routes during maintenance works.
For vertical separation between gravel strips and their surroundings, the use of SP AL trims are recommended on extensive green roofs whereas on intensive green roofs we recommed the use of lawn edging elements or the use of SP GS steel trims produced to heights specified to fit the requirements of the project. These metal balast trims serve as an aesthetic separation and demarcation tool between the gravel strip and the substrate while preventing the two from mixing together and simultaneously preventing strong plant growth in the gravel strip area.

SP AL ballast retention trim



SP GS ballast retention trim for intensive green roofs



TG-F fixed height terrace drain grille

TG-A height adjustable terrace drain grille

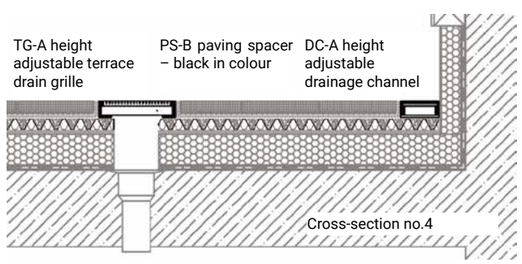
DC-F fixed height drainage channels with UV-resistant polypropylene casings

DC-F fixed height and DC-A height adjustable drainage channels with perforated steel casings

Drainage channels, terrace grilles and paving spacers

On ground level, surface drainage can be created by grading an area so that water collects and flows to a lower elevation away from the site. However, on a rooftop, owing to the fact that the depth of the insulation and thresholds are fixed, drainage channels and terrace grilles differ from their conventional counterparts installed in regular gardens. Moreover, it is also essential to maximise the drainage of the surface water on the flooring of the terrace that is to be installed.
As there is no need for water retention beneath the flooring layer of the terrace but rather for proper drainage, SedumDrain® 25 is installed with the diffusion holes lying down on the protection mat in case of a conventional roof build-up or in the case of an inverted roof build-up the diffusion holes are lying down on the separation sheet. SedumDrain® 25 is infilled with graded gravel (recommended non-carbonate aggregate) that can help to level the slope on the roof. In the case that paving slabs are chosen as flooring option, PS-B / PS-T spacers are used to keep the joints permanently open between the slabs for effective water drainage. (Cross-section no.4)
Rainwater running down the facades can often amout to that accumulating from the horizontal roof surface. It is therefore crucial that at the junction of these planes water is prevented from building up using multi-directional darainage channels and terrace grilles with open or perforated undersides that enhance the channeling of the surface water to the drianage board beneath the flooring layer. Fixed (TG-F) and adjustable (TG-A) height terrace grilles inserted in UV-resistant polypropylene casings with open undesides or inserted in perforated steel casings are all available in our product range. We also produce them in stainless steel.

Drainage channels with fixed height (DC-F) / with adjustable height (DC-A)
At upstands the waterproofing must be taken up 150 mm above the finished surface of the roof – 100 mm if the pitch is above 5%. Providing a 150 mm upstand beneath door thresholds is often difficult to achieve. The installation of a fixed (DC-F) or adjustable (DC-A) height drainage channel can solve the problem because the depth of the upstand in this case is calculated from the bottom of the drainage channel's underside. Fixed (DC-F) and adjustable (DC-A) height drainage channels inserted in UV-resistant polypropylene casings with open undesides or inserted in perforated steel casings are available in our product range. We also produce them in stainless steel.



Lawn edging / Edging restraint

The **ArchiGreen® LE 175** lawn edging metal profiles are installed by professional gardeners to provide an aesthetic and permanent solution in establishing neat demarcations between the various media and aggregates present in the garden. Due to its bendable feature, this product is an excellent choice where curves are common in pathways and borders.

	Height	Width	Length	Weight
LE 175	175 mm	20 mm	1495 mm	2.21 kg/m

The metal profiles are available in galvanised and stainless steel. Material thickness of the galvanised steel plate is 1 mm which is bent back on top to blunt the upper edge of the profile to 2 mm. Vehicles are prohibited to cross the lawn edging profiles.

For further technical data visit www.archigreenltd.com

Installation of the ArchiGreen® LE 175

Following the appropriate preparation of the soil, the demarcation line where the edging product needs to be installed is marked with a string; then, using a spade, a narrow rift is dug along the track set by the string to fit the LE 175 metal profiles to their desired depth (130 to 150 mm deep, so that the upper edge of the product is either flush with the lawn or max. 20 mm above the ground). The profiles are abutted via the metal connectors at the ends and installed upright in the rift. With the aid of a snips tool the traingular perforations along the stiffening flange can be easily cliped off to form curves or even right angles from the profiles. A rubber-headed mallet is used for fine positional adjustments of the profiles which are then fixed in place using anchoring nails of size Ø8 x 300 mm. This fixing method needs 2 anchoring nails / profile when forming straight demarcations whereas 3 to 5 nails / profile are required when forming curves.

Benefits of the LE 175 and the PER-P

- Simple border edging.
- Quick easy installation.
- Professional, unobtrusive finish.
- Lightweight
- Easily edges corners and curves
- Easily cut to size.
- Helps secure pavers and prevents them from moving horizontally.
- Can be installed before or after the pavers have been installed.

Garden and green roof products

The **ArchiGreen® PER-P** is a quick and simple paving restraint system. It provides an aesthetically appealing finish to almost any application, including block paviours, garden paths or gravel strips. The 100 mm depth paver edge restraint is also suitable to fulfil the role of ballast edge trims on extensive green roofs.

	Height	Width	Length	Weight
PER-P 45	45 mm	80 mm	1000 mm	0.45 kg
PER-P 100	100 mm	85 mm	1000 mm	0.75 kg

PER-P is made from UV & frost resistant recycled polyethylene. It is resistant to various acids that can be found in the soil. The wall thickness of the restraint profile is 4 mm.

For further information visit www.archigreenltd.com

Installation of the PER-P restraint

The paver edge restraint profiles (PER-P) are abutted via the connectors located at the end of each profile. Following the appropriate preparation of the foundation, these abutted profiles or borders are then fixed in place using anchoring spikes (dia.16x250 mm) made of plastic that can be additionaly ordered. With the aid of a snips tool the stiffening flange can be easily cut to form curves quickly. The palstic borders are suitable to retain the edges of various pavers on terraces and patios. In the case of establishing linear retention schemes (i.e forming straight lines) the number of anchoring spikes required to fix each plastic restraint profile is 3 whereas in the case of forming retention curves the number of anchoring nails increases to 4 - 5 nails per restraint. Once installed, the edge restraints are covered and the demarcation line between turf and other types of ballast is virtually invisible. Vehicles are prohibited to cross the paver edge restraints unless installed at least 2 cm the pavers' level.

ArchiGreen®

Manufacturer:

ARCHIGREEN Zöldtető Ltd.
15. Kossuth Lajos street • Tényő H-9111
Website: www.archigreenltd.com
E-mail: info@archigreenltd.com
Telephone: +36 70 666 3922

Distributor:

Disclaimer:

ArchiGreen® Green Roof Catalogue no.: GB ZK 2018-09-24