



The Parc - a significant green roof above an inner city carpark, Auckland

GREEN ROOF SYSTEM Technical Brochure

Key features and benefits

A Green Roof system looks great while being good for the environment.

If you want to create a building that sits comfortably within the landscape, or you want to bring nature into areas where normally concrete and asphalt prevail, a Green Roof system provides the solution.

Green roof systems are equally applicable on office towers, discrete rural properties, hospitals or for podium areas above carparks.

Hard construction materials discharge water very quickly, reducing effective evaporation and loading the drainage systems. Green roofs retain a very high percentage of rainwater and provide slow, controlled water run-off.

Green roofs can improve the acoustics and thermal properties of the building while also providing additional natural environment space for recreational and leisure purposes. Green roofs can significantly increase the life of the waterproofing membrane, protecting it from UV degradation, physical damage and the extremes of climatic conditions.





Sod Roof

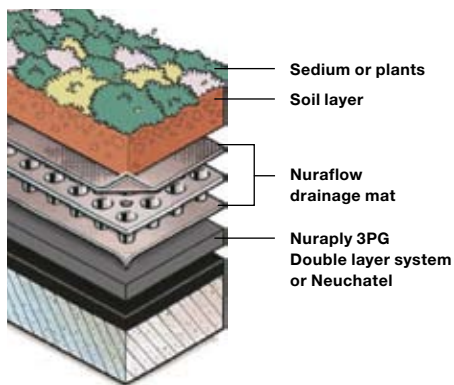


Beach Retreat, Northland

Intensive Roof Garden

What are the green roof options?

EXTENSIVE ROOF AND BIODIVERSITY SYSTEMS



Extensive roof gardens

These are constructed using low maintenance planting, without the need for specific irrigation. Sedums (succulents) and indigenous herbs and grasses provide excellent cover and protection to the waterproofing system.

They do not provide usable space or a surface that can be trafficked, but add instantly to the aesthetics, and help to control rainwater run-off into surface water drainage systems.

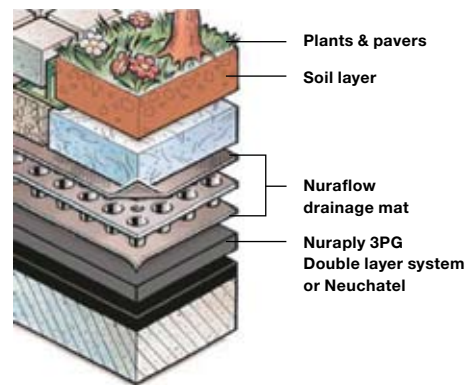
In addition, a correctly designed system upgrades the acoustic and thermal performance of roof finishes.

Biodiversity roof gardens

Sometimes described as “Brown roofs” these are another form of extensive roof gardens that make use of recycled materials e.g. crushed brick, crushed concrete etc. in the growing medium. This type of green roof is intended to create a natural wasteland and can be seeded initially with selected species to create some growth. However the basic design is to attract fauna and flora of all kinds. As the growing medium is not of high nutritional value, larger plants are not likely to survive and will die off creating further suitable habitat for invertebrates which in turn will attract other fauna.

The underlying waterproofing and drainage requirements are the same as an extensive roof system.

INTENSIVE ROOF AND SOD ROOF SYSTEMS



Intensive roof gardens

The landscape variations are practically limitless, and it is feasible to create an environment at roof level similar to that of any designed garden. An increased quantity of growing medium, improved drainage layers and irrigation systems are generally required to support the greater diversity of planting. Shrubs and trees can easily be accommodated, and there is little to restrict scope for design other than the overall weight of the system and the cost of its supporting construction.

Sod roofs

These are topped with regular grass to blend the building into the surrounding environment. They are particularly popular in rural environments where the building is required to be unobtrusive. In addition, a correctly designed system upgrades the acoustic and thermal performance of roof finishes.

The underlying waterproofing and drainage requirements are the same as an extensive roof system.



Melting bitumen adhesive pad



3PG heat welded to basesheet



Drainage mat laid on membrane

Waterproofing – at the heart of every roof garden

Every successful roof garden system is built upon a sound waterproofing foundation. It is therefore essential to select a waterproofing manufacturer and a roofing system that can be trusted to give long term, guaranteed performance.

Nuralite and Neuchatel are the obvious choice because we offer a complete system featuring a full range of purpose designed waterproofing, drainage and filter layer options.

All green roof projects are fully supported by an unrivalled technical service and design team, available from consultation stage, throughout the contract and beyond. By working closely together, Nuralite and Neuchatel advisors have the ability to recommend the best waterproofing system for your project – bituminous membrane or mastic asphalt – something no other company can match.

For peace of mind part of the roof garden package includes a full quality assurance check of the waterproofing system prior to the roof garden layers being installed and the waterproofing system is also backed with a comprehensive range of waterproofing performance warranties.

Finally, we have partnered with New Zealand's leading green roof specialist, Greenroofs Ltd, to assist when it comes to soil, plant and irrigation considerations. This ensures that every roof garden project is designed and installed to the highest standards – and will remain healthy and attractive with the minimal amount of watering and effort.

Warranty

Nuralite warrants Nuraply 3PG against materials defects for 20 years from the date of installation. The warranty must be applied for at the completion of the job. The workmanship is covered by a separate workmanship warranty issued by the Nuralite approved applicator.

Neuchatel warrants the Mastic Asphalt system against materials defects for 20 years from the date of installation. The warranty must be applied for at the completion of the job. The workmanship is covered by a separate workmanship warranty issued by the Neuchatel applicator.

Building Code Compliance

Because of their nature, Green Roofs require special documentation when applying for building consent. Our advisors are happy to assist with any planning questions prior to submission to consent authorities.

Green roofs can address concerns of neighbours where resource consent objections are raised.

Things to consider

The substrate provides the foundation for a successful system. Because of the weight of a Green Roof system, specific engineering design is important.

Drainage must be carefully considered to ensure the system does not flood. Our Green Roof system has been designed to ensure that drainage is kept clear and effective. Details need to be carefully designed to ensure the drainage system works effectively.

Ventilation is very important to remove condensation buildup within ceiling spaces. A Nuravent every 20m² of roof surface is recommended but attention must be paid to placement to allow for cross flow air movement.

The growing medium and plants must be carefully chosen to ensure the system flourishes. Consult experts in the field such as Greenroofs NZ (www.greenroofs.co.nz) for advice on this area.

Applicators

All of our authorized applicators have been trained at our premise followed by on-site training. Most applicators have been working with our systems for many years.

We work closely with applicators to ensure quality standards are maintained.

Our applicators install the waterproofing system and drainage layer. The landscape aspects should be performed by skilled professionals.

Technical information

A comprehensive set of design details and specifications are available at www.nuralite.co.nz

Our Technical advisors are all very experienced and willing to help either on the phone, in your office or on site. Call **09 579 2046** or **0800 Nuralite (0800 687254)**.

Waterproofing systems

NURAPLY 3PG DESCRIPTION

For Green Roofs a two layer system is required. The preferred base sheet is Nuraply 3PV because it allows for venting of moisture or condensation. Alternatively Nurabasesheet can be used if appropriate.

The cap sheet is Nuraply 3PG. This membrane is specifically designed for Green Roofs as it is impregnated with a herbicide to discourage roots from attacking the Nuraply 3PG sheet. It also has a smooth surface to ensure waterflow is unimpeded by sediment or aggregate chips.

COMPOSITION NURAPLY 3PG

- ▶ Polyester composite reinforcement 180 g/m²
- ▶ Coating mass: plastomer bitumen, consisting of ±70 % bitumen and ±30% atactic polypropylene (APP) with addition of a root rejecting element.

TECHNICAL SPECIFICATIONS (AVERAGE VALUES)

- ▶ Tensile strength (U.E.A.t.c.) L: 900 N
T: 650 N
- ▶ Elongation at break (U.E.A.t.c.) L: 45%
D: 45%
- ▶ Resistance to heat (U.E.A.t.c.) ≥ 140°C
- ▶ Low temperature flexibility (U.E.A.t.c.) - 8°C
- ▶ Dimensional stability 0.2%
- ▶ Root Resistance according to DIN 4062

DIMENSIONS

- ▶ Thickness: 4 mm
- ▶ Length: 10 m
- ▶ Width: 1 m
- ▶ Average weight: 40 kg

NEUCHATEL DESCRIPTION

A thermo-plastic material, that when heated, can be formed into any shape. Upon cooling it becomes waterproof with seamless joints.

The product comprises suitably graded aggregates bound together with an asphaltic cement (primarily refined bitumens) to produce a dense voidless screed.

Neuchatel asphalt cannot be compacted and is spread and trowelled rather than rolled. For Green Roof Systems, roofing asphalt is normally laid in two coats to a total thickness of 20mm on an underlay of black sheathing felt laid loose with 50mm lapped joints.



Nuraflow Green Roof drainage mat

		4+1	5+1
Geotextile	Material Filter fabric Weight in gr/m ²	Polypropylene non-woven 140	Polypropylene non-woven 140
Core	Material Thickness in mm Compressive strength in kN/m ²	Polystyrene 11.11 712	Polystyrene 25.4 383
Perforations	Flow perforations in l/sec/m ² Water reservoir in l/m ² Perforations per m ² Diameter perforations in mm	2 1.6 1570 6.7	4 3.2 550 17
Pressure dividing backing / separation geotextile	Material Fabric Weight in gr/m ²	Polypropylene Geotextile 135	Polypropylene Geotextile 135
Dimensions (+/- 2%)	Width in cm Length in m Surface per roll in m ²	125 32 40	125 20 25

To the best of our knowledge, the information in this brochure is accurate at the time of printing. Nuralite Waterproofing Ltd reserves the right to alter information, formulation or parameters at any time without notice.

