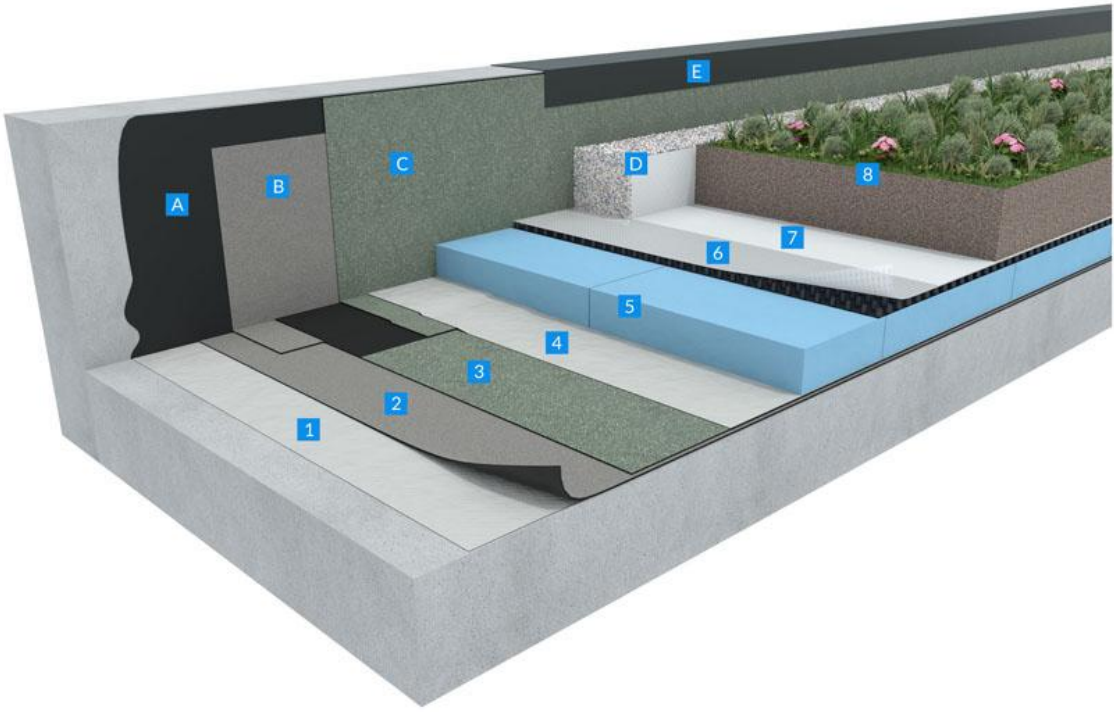
Intensive Green Roof - Accessible for multi-use
Double layer bitumen waterproofing system:
PREFLEX + GRAVIFLEX

Substrate & Use of roof	Finishing	Standard warm roof / inverted roof
Concrete Intensive green roof for podium decks, multi-use terraces	Traditional vegetation	Inverted roof



- **Substrate**
  The load bearing structure (trapezoidal metal sheet, concrete or wooden) must comply with all associated national standards and regulations, ensuring that the load bearing capacity is sufficient for any additional loads imposed upon the construction. It is important to consider the possibility of future deflection of the construction when designing roof drainage.

  - **Preparation:** The bearing elements and substrates must comply with local technical standards. After proper cleaning of the roof area, a complete control shall be carried out by the Contractor. Slope and planarity shall be carried out with the following tolerances:

- **Slope:**
  2-5 % on concrete decks (depending on the type of terrace, please contact the BMI Technical Department).
  - Water pounding areas shall be identified clearly.
- **Levels**:
  Tolerances for planarity shall be:
  - 7 mm with a 2 m straight edge.
  - 2 mm with a 200 mm straight edge.
- **Surface:**
  Prepare substrate surfaces thoroughly prior to application of new roofing materials. This is particularly important for refurbishment applications. Providing a smooth, even, sound, free of dust, grease and oil, foreign chemicals, curing compound, clean and dry substrate minimises the likelihood that underlying deficiencies will cause premature deterioration or even failure of the new roofing system.

  Concrete:
  Masonry bearing elements and substrates in compliance with local technical standards.
  Are not accepted: slope screeds of lightweight concrete.

- **Upstands/Parapets:**
  Siplast Primer: cold-applied, quick drying, universal elastomeric bitumen primer. Approx. coverage 0.15 litre/m² on steel and approx. coverage 0.30 litre/m² on concrete (depending on concrete porosity, please consult the supplier's technical documentation).
  Preflex: Polyester-reinforced, 3 mm thick modified SBS elastomeric bitumen underlayer membrane for upstands on roof gardens, green roofs and accessible flat roofs for pedestrians or light vehicles. Thermofusible film on both sides. Fully torched on primer.
  Graviflex: Polyester-reinforced, modified SBS elastomeric bitumen cap sheet membrane with anti-root additive for roof garden waterproofing. Upper surface is protected with slate flakes, thermofusible film on the underside. Nominal thickness on the longitudinal selvedge: 3.2 mm. Fully torched on top of the Preflex.

  Vegetation barrier between parapets and soil is carried out with gravel (or with **Draina G10** and/or **Canopia Drain** boards for surfaces <100 m² with **Canopia Filtre**).

- **Separation layer**
  Verecran 100: 100 g/m² glass fibre mat as a separation layer, loosely laid.

- **Waterproofing**
  Preflex: Polyester-reinforced, 3 mm thick modified SBS elastomeric bitumen underlayer membrane for upstands on roof gardens, green roofs and accessible flat roofs for pedestrians

or light vehicles. Thermofusible film on both sides. Loose-laid on top of the Verecran 100, torched overlaps.
Graviflex: Polyester-reinforced modified SBS elastomeric bitumen root resistant cap sheet for double layer waterproofing systems, used for waterproofing of green roofs/roof gardens or flat roofs with different uses: planted areas, access for pedestrians, access for light vehicles. Upper surface is protected with slate flakes, thermofusible film on the underside. Nominal thickness on the longitudinal selvedge: 3.2 mm. Fully torched on top of the Preflex.
Verecran 100: 100 g/m² glass fibre mat as a separation layer, loosely laid between Graviflex and XPS boards.

The GRAVIFLEX System comprises two waterproofing membranes for multi-use green roofs or podium waterproofing: Preflex and Graviflex bonded together by torching. It is a universal system for different uses on the same flat roof or podium/plaza decks that can be used on a combination of areas: roof gardens for pedestrians, blue roofs, access for light vehicles, inaccessible areas with gravel or self-protected.

- **Insulation:** Extruded polystyrene (XPS) boards.

- **Separation & Protection layers**
  Draina G10: Composite drainage and separation layer with embossed form made from polypropylene and covered with a permeable non woven polyester filter layer. It is used:
  - as a separating layer between the waterproofing and the heavy ballast made of concrete screed, prefabricated slabs of concrete or hard stone.
  - as a drainage and filtering layer in green roof systems with slope < 20% and including no puddling (depression) more than 10 mm deep.

  Draina G10 loose-laid on the insulation boards.
  Canopia Filtre: 200 g/m² non-woven polyester fleece used as a protection layer on green roofs between the drainage layer and substrate (soil) and/or separation layer between peddle strips and substrate. Loose-laid horizontally on top of drainage boards before the substrate/top soil (top soil ≥ 30 cm high according to type of vegetation) and also vertically along the upstands.
  Maintenance of traditional vegetation should be carried out by a paysage company.

- **Walkways / multi-use areas:**
  The protection is carried out with **Nidaroof** plates filled with fin gravels/chippings to stabilise the circulation areas with Nidaroof plates.
  Nidaroof: Alveolar structured rigid plastic plate covered by a nonwoven polyester on the underside, used for gravel stabilisation. **Nidaroof 40-1F** (for chippings thickness of 4 cm) or **60-1F** (for thickness 6 cm) with polyester underside loosely laid on the waterproofing and filled with gravels.

OR with prefabricated concrete slabs: Drainage and separation layer, **DRAINA G10,** loosely laid, precast concrete slabs laid dry, joints dry. Dimensions 0.40 to 0.60 m for walkways.

Finish for multi-use areas: slabs laid dry, with wide joints, directly on the ground, self-supporting slabs placed on free-standing side walls, prefabricated slabs, paving stones, etc. installed on the draining and filtering layers (the drainage layer must be gravel/stone).

Paving or wooden tiles on pedestals (0 to 5% slope) and / or protection with heavy cement screed for tiling (2 to 5% slope) complying with local technical standards are applied on the waterproofing system. In these cases, circulation zones should be limited from the planted areas by placing or constructing low walls on-the-site on the separation and protection layers (Canopia Filtre and Draina G10). For on the site application of low walls, please consult the detailed technical documentation.

- **Expansion Joints:**
  Expansion joints have especially to be planned by the architects and are project specific.

  Recommendation:The expansion joints will be prepared in compliance with the **Neodyl System** technical assessment. The Neodyl System comprises **Cordon Neodyl**, **Joint Neodyl (Bande Neodyl)** lyred-shaped waterproofing strips and a protection system (in case of green roofs, it is GRAVIFLEX to be torched). It will have a kerb, raised flat, flat, with upstands-in certain cases.

  The Neodyl System is used for structural expansion joints on pedestrian accessible roofs, roof gardens and non-accessible exposed roofs. Suitable for all roof substrates.
  For more information please consult the **“Roof Details and Connections”.**

- **Details**
  All details shall be finalised before roofing works start:

  Rainwater drains shall be well located, in sufficient number and ready to receive waterproofing membranes.

  Expansion joints shall be located at the highest roof points, on reinforced concrete curbs chamfered as shown on drawings.

  All pipes, cables and other penetrations shall be in place. Provision for proper waterproofing of roof equipment and machinery shall be made.

  All parapets shall be in place, with provision for groove or counter flashing at an acceptable height (150 mm above finished roof level).

  All other planted area details please consult the detailed green roof catalogues, technical documents, installation manuals or contact directly the BMI Technical Department.