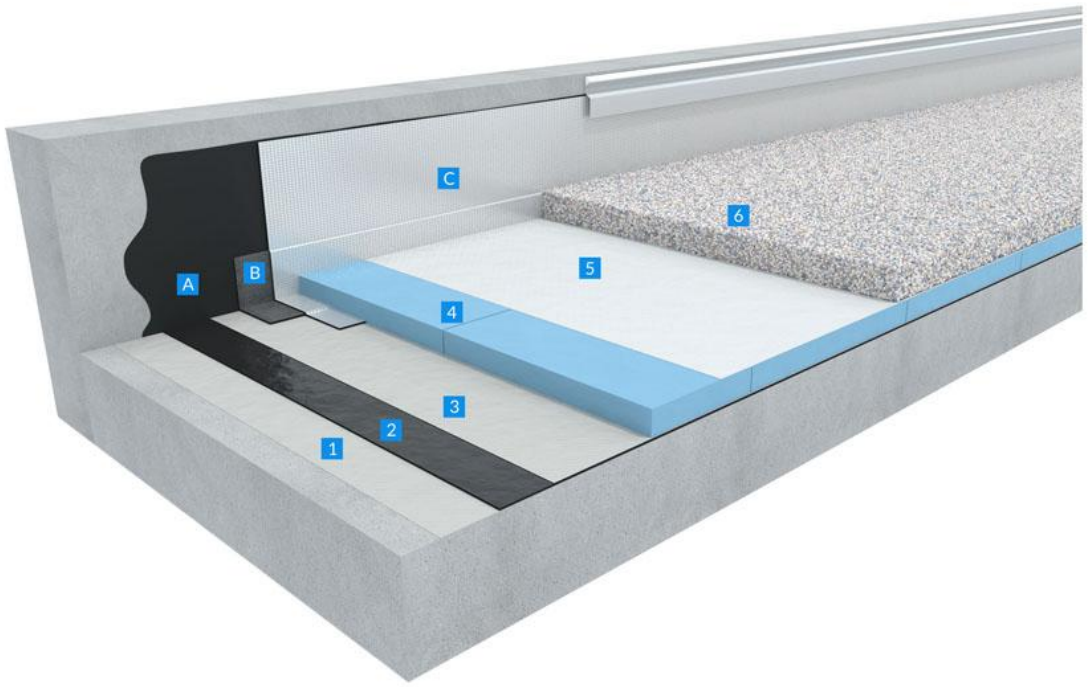
Non-accessible with gravel ballast (maintenance access only) - Inverted roof
Single layer bitumen waterproofing system:
TERANAP JS

Substrate & Use of roof	Finishing	Standard warm roof/ inverted roof
Concrete Technical roofs with M & E equipment	Gravel ballast	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:**
  Exposed roofs: Minimum slope requirement, 2 % on concrete deck (depending on type of terrace, please contact BMI Technical Department).
  - Water pounding areas shall be identified clearly.
- **Levels**:
  Tolerances for planarity shall be:
  - 10 mm with a 2 meters straight edge.
  - 3 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 or masonry:
  Masonry bearing elements and substrates in compliance with local technical standards
  Are not accepted: slope screeds of lightweight concrete.

- **Upstands**
  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).
  Parequerre: Nonwoven polyester-reinforced modified SBS elastomeric bitumen angle strip. Cut in 0.25 m or 0.33 m wide strip for use as reinforcement angle on upstands. Torched at the junction of the parapet with the main area.
  Paradial S: 3.7 mm thick glass fibre-reinforced modified SBS elastomeric bitumen cap sheet protected by embossed thermo-stable aluminium foil. It is used as a cap-sheet layer for vertical upstands waterproofing works and in a double-layer system for non-accessible roofs. Thermofusible film on the underside surface, nominal width 70 mm on the longitudinal selvedge. Fully torched.

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

- **Waterproofing**
  Teranap JS: 4 mm thick, polyester-reinforced modified SBS elastomeric bitumen membrane with double joints used as a single layer, loosely laid. Along the selvedge, self-adhesive

overlap is protected by siliconized release paper. Waterproofing is secured by a covering strip (20 cm width “Bande Couvre Joint”) torched onto overlaps. Upper and under surfaces: film/film.
Verecran 100: 100 g/m² glass fiber mat as a separation layer, loosely laid.

- **Thermal Insulation**
  Extruded polystyrene boards (XPS) Class C minimum.

  Heavy pedestrian traffic and technical zones circulation for industrial roofs: the compressibility class of thermal insulation panels should be taken into consideration according to the use/destination of the roof and building. It must support high compressive loads without deflection or movement. Consult the supplier’s technical documentation and local regulations.

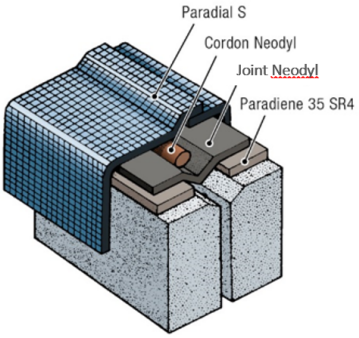
- **Protection / finishing layer:**
  Canopia Filtre: 200 g/m² non-woven polyester fleece as a protection layer, loose-laid on top of XPS boards before gravel ballast layer.

  Minimum 5 cm river washed gravel layer* on top of Canopia Filtre.
  **In case of strong wind loads (height greater than 28 m, or greater than 20 m in zone 2 exposed site, or zone 3 normal site, or whatever its height, in zones 3 exposed site or 4 all sites): stabilized gravel layer with 2 m wide of Nidaroof plates (same for the protection of technical circulation areas) around the perimeter of the roof and to the right of emergencies.*
  Please consult the BMI Technical Department for wind-up load calculation when necessary.River washed gravel layer, minimum 5 cm.

- **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 (metallic surfaced Paradial S torched or Supradial GS; or protective slabs). 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.



Application:

- ➔ Apply **Siplast Primer** on each joint side
- ➔ 3.5 mm thick, polyester reinforced **PARADIENE 35 S R4** modified SBS elastomeric bitumen membrane, torched on top of the Siplast Primer
- ➔ Unreinforced lyre-shaped strip **Joint NEODYL** fully torched on Paradiene 35 S R4 membranes to the edge of the chamfer
- ➔ Place **Cordon NEODYL** (⌀ 30 mm) in the lyre of Joint Neodyl strip
- ➔ Protection: with a top layer of **PARADIAL S**, 3.7 mm thick modified SBS elastomeric bitumen membrane with glass fibre reinforcement, self-protected by a thermo-compensated aluminum foil, fully torched. Alternatively, the Supradial GS granule-surfaced membrane can be torched. Protection can also be done by paving tiles, depending on expansion joints and project requirements.

- **Details**

  All details shall be finalized before roofing works to start:

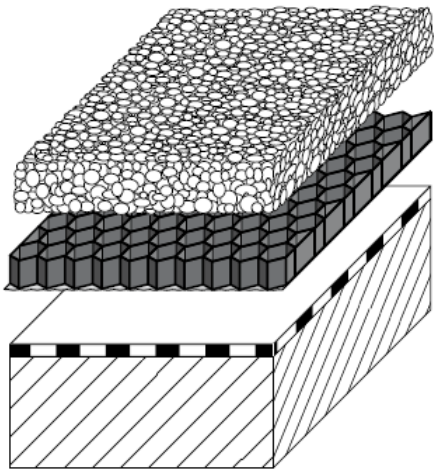
  Rainwater drains shall be well located, in sufficient number and ready to receive waterproofing membranes.

  Expansion joints shall be located at 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 at 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).

- **Walkways / technical circulation areas:**
  The protection is carried out as indicated below:

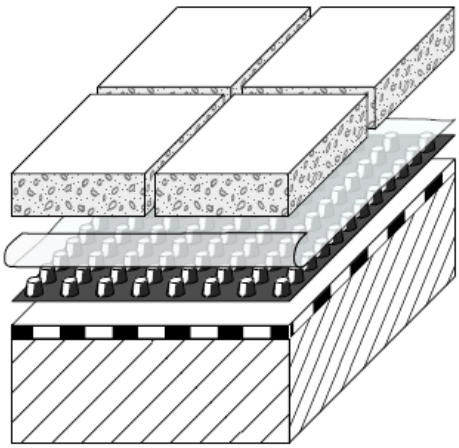


Fin gravels/chippings:
4 or 6 cm thick layer of fin gravels/chippings to stabilise the circulation areas with Nidaroof plates.

Nidaroof plate: Alveolar structured rigid plastic plate covered by a polyester nonwoven on the underside, used for gravel stabilization
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 the layer of gravel.

CANOPIA Filtre: nonwoven separation and filter layer, loosely laid on top of XPS insulation boards.

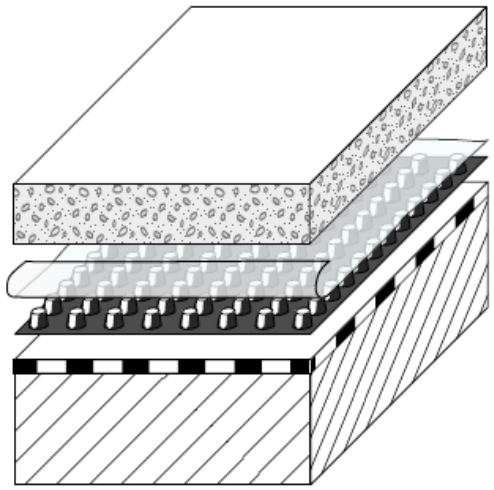
OR with prefabricated concrete slabs:



Precast concrete slabs: laid dry, joints dry
Dimensions 0.40 to 0.60 m for walkways

Drainage and separation layer: **DRAINA G10,** loosely laid on XPS boards

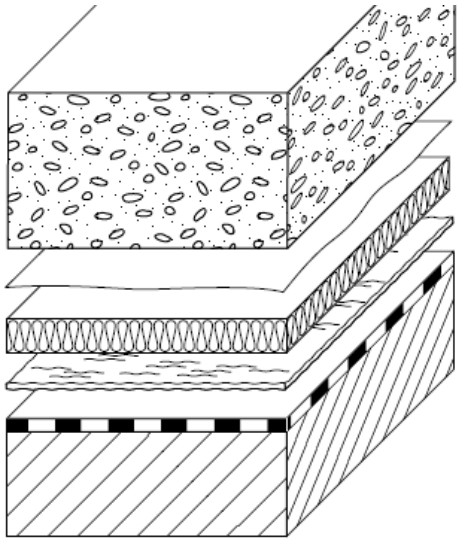
OR mortar or concrete screed poured in situ:



Mortar or concrete screed: Minimum thickness 0.04 m. Mixed with a water-reducing plasticizer.

Drainage and separation layer: **DRAINA G10,** loosely laid on XPS boards.

- **Protection of roof perimeter walkways for facade access & maintenance devices:**



Reinforced concrete paving:
Mixed with a water-reducing plasticizer

Separation layer:
- Synthetic film 100 µ.
- Non-woven separation layer: **Canopia Filtre**.

Splitting the paving:
Minimum 20 mm joints at every 5 m maximum in line with reliefs and emergencies.
Joint filler with rot-proof and suitable against deformation alternate.
Note: These protection works are out of the waterproofing company's scope.