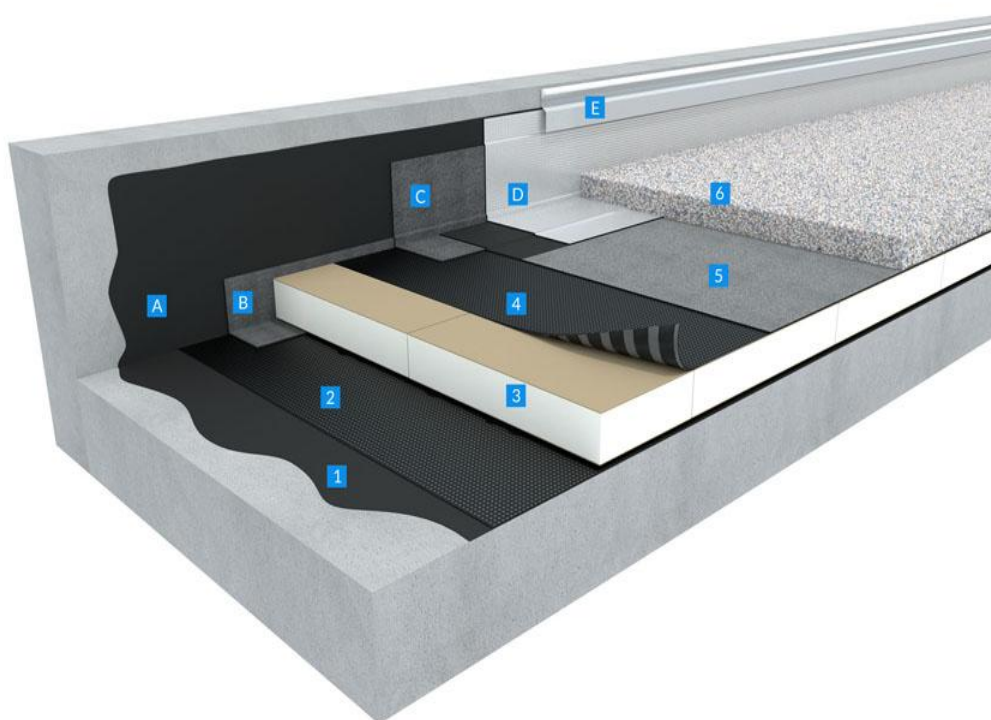


Non-accessible roof with gravel ballast - maintenance access only
Double layer bitumen waterproofing system:
PARADIENE JS R4 + PARADIENE BD S

Substrate & Use of roof	Finishing	Standard warm roof /Inverted roof
Concrete Technical roofs with M & E equipment	Gravel ballast	Insulation under waterproofing



- **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:

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- **Slope:**

Exposed roofs: Minimum slope requirement, 2 % on concrete deck (depending on type of terrace, please contact BMI Technical Department).

 - Water ponding areas shall be identified clearly.
- **Levels:**

Tolerances for planarity shall be:

 - 10 mm with a 2 m 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/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).

Parquerre: Nonwoven polyester-reinforced modified SBS elastomeric bitumen angle strip. Cut in 0.25-m or 0.33-m wide strips 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.

OR alternatively, **Supradial GS:** 3.5 mm thick on the longitudinal selvedge (without mineral finish), modified SBS elastomeric bitumen cap sheet with composite reinforcement, protected by embossed aluminium foil with coloured mineral finished upper surface, thermofusible film on the underside. Fully torched.
- **Vapor Control layer**

Siplast Primer: cold-applied, quick drying, universal elastomeric bitumen primer. Approx. coverage 0.30 litre/m² on concrete (depending on concrete porosity, please consult the supplier's technical documentation).

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Irex Profil: Glass fibre-reinforced modified SBS elastomeric bitumen vapour control layer, fully torched

- **Insulation**

Thermal insulation **Class C** minimum: Polyisocyanurate boards (PIR) and polyurethane boards (PUR) with fibre reinforced coated facing, perlite fibre boards, mineral wool, expanded polystyrene boards (EPS) are glued with **PUR Glue**, bitumen-faced cellular glass insulation boards laid in hot-bitumen (without vapor control layer).

In case of use of EPS boards, apply **ADEALU** which is modified self-adhesive bitumen tape surfaced with a composite aluminium-polyester (Grey or coloured) foil, at the junction of first layer of waterproofing and the parapet before torching the reinforcement angle (Parequerre). ADEALU is used as a flame barrier for EPS insulation.

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.

- **Waterproofing**

Paradiene JS R4*: 2.6 mm thick, modified SBS elastomeric bitumen underlayer membrane of the double layer system under heavy protection with polyester reinforcement and self-adhesive overlaps that protects the insulation from the torch flame. Thermofusible film on the underside, sanded on the upper surface. Loosely laid on top of insulation boards, self-adhesive overlaps.

For cellular glass insulation boards, Paradiene JS R4 underlayer membrane is replaced by **Paradiene S R4 to be torched on top of bitumen-surfaced.*

Paradiene BD S: 2.6 mm thick, glass fibre-reinforced, torch-applied modified SBS elastomeric bitumen membrane for use as a base layer or cap sheet with additional protection. Thermofusible film on the underside, sanded on the upper surface. Fully torched on top of the base layer.

- **Protection layer/finishing layer:** Minimum 5 cm river washed gravel layer*.

**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 Nidarroof plates (same for the protection of technical circulation areas) around the perimeter of the roof and to the right of emergencies.*

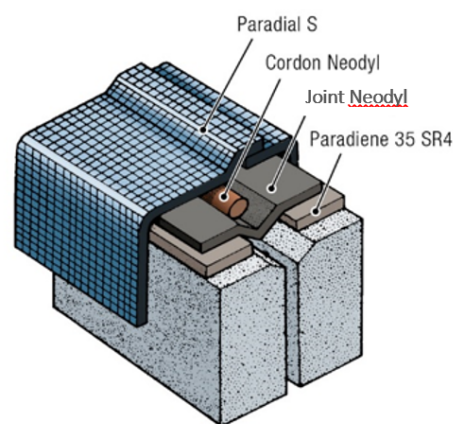
Please consult the BMI Technical Department for wind-up load calculation when necessary.

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

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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 Paradiel 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** (\varnothing 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 aluminium 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 start:

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

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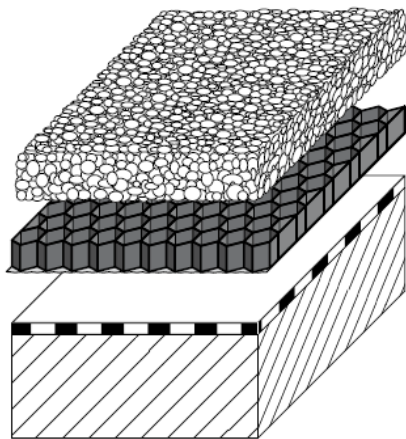
Expansion joints shall be located at the highest roof points, on reinforced concrete curbs chamfered as shown on drawings.

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).

- **Walkways / technical circulation areas:**

The protection is carried out as indicated below:



Fin gravels/chippings:

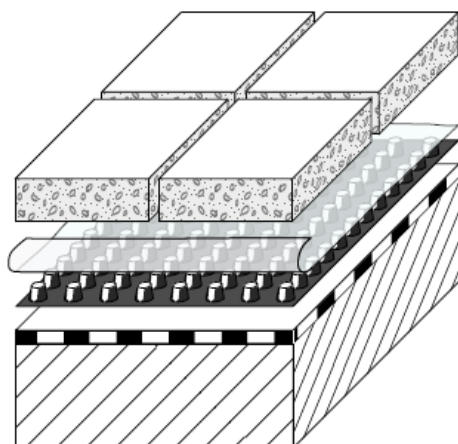
4 or 6 cm thick layer of fin gravels/chippings to stabilise the circulation areas with NidarooF plates.

NidarooF plate: Alveolar structured rigid plastic plate covered by a polyester nonwoven on the underside, used for gravel 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 the gravels.

CANOPIA Filtre: nonwoven separation and filter layer, loosely laid on top of waterproofing membrane

OR with prefabricated concrete slabs:

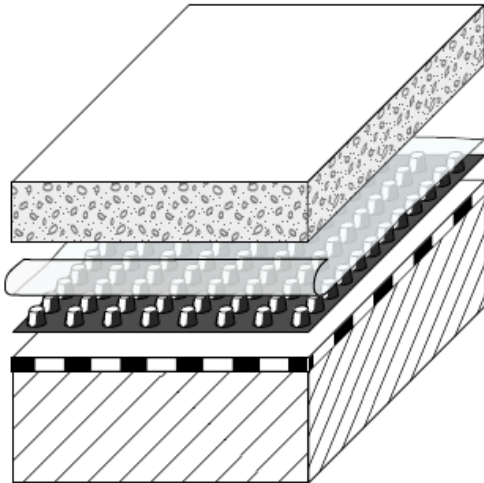


Precast concrete slabs: laid dry, joints dry
Dimensions 0.40 to 0.60 m for walkways

Drainage and separation layer: **DRAINIA G10**, loosely laid

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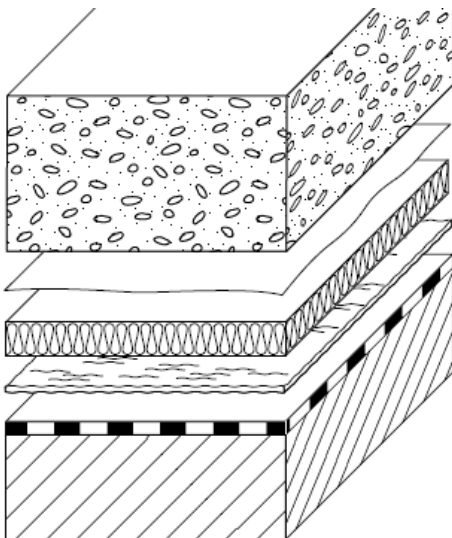
OR mortar or concrete screed poured in situ:



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

Drainage and separation layer: **DRAIN A G10**, loosely laid

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 .
- 0.02 m thick, Class F expanded polystyrene panels (EPS)
- 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 root-proof and suitable against deformation alternate.

Note: These protection works are out of the waterproofing company's scope.

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