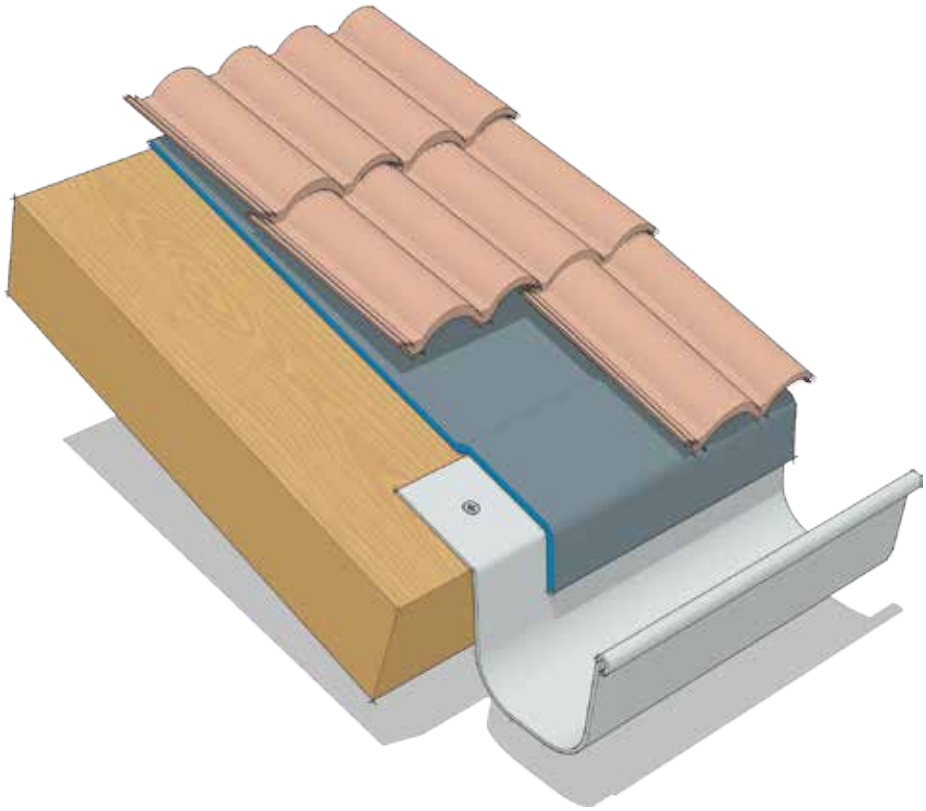
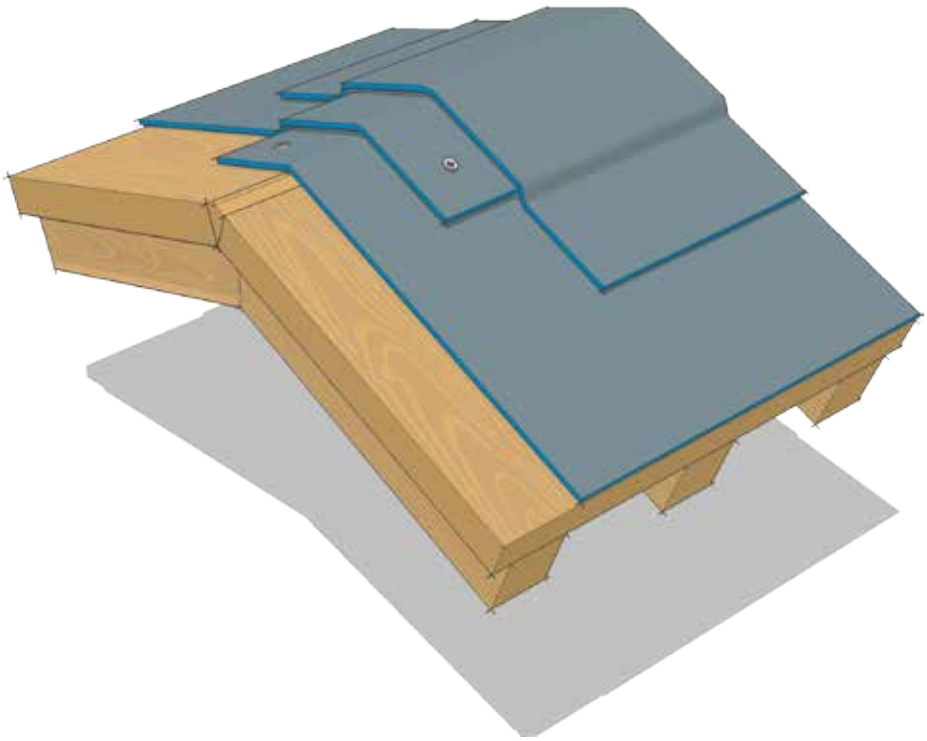
INSTALLATION DETAILS

Details	Individual
1	**Under tile bitumen membrane connection with gutter channel**
2	**Under tile bitumen membrane connection roof ridge**
3	**Double aerator**
4	**Roof joint**
5	**Double roof joint**
6	**Horizontal drain**
7	**U.T.A. support**
8	**Single layer skylight**
9	**Double layer skylight**
10	**Life line rod**
11	**Photovoltaic system fitting**
12	**Recessed tube**

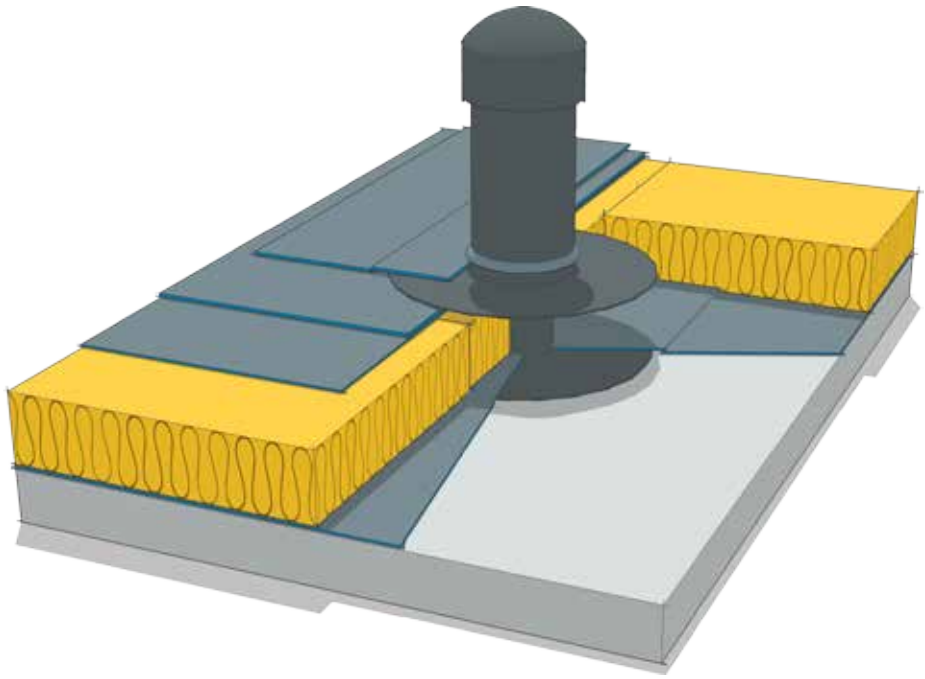
1 Under tile bitumen membrane connection with gutter channel



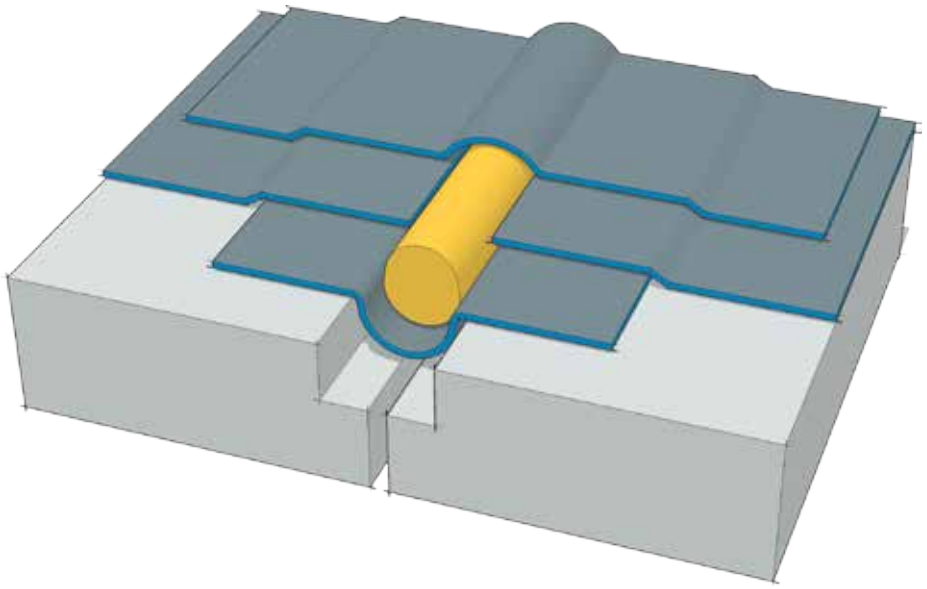
2 Under tile bitumen membrane connection roof ridge



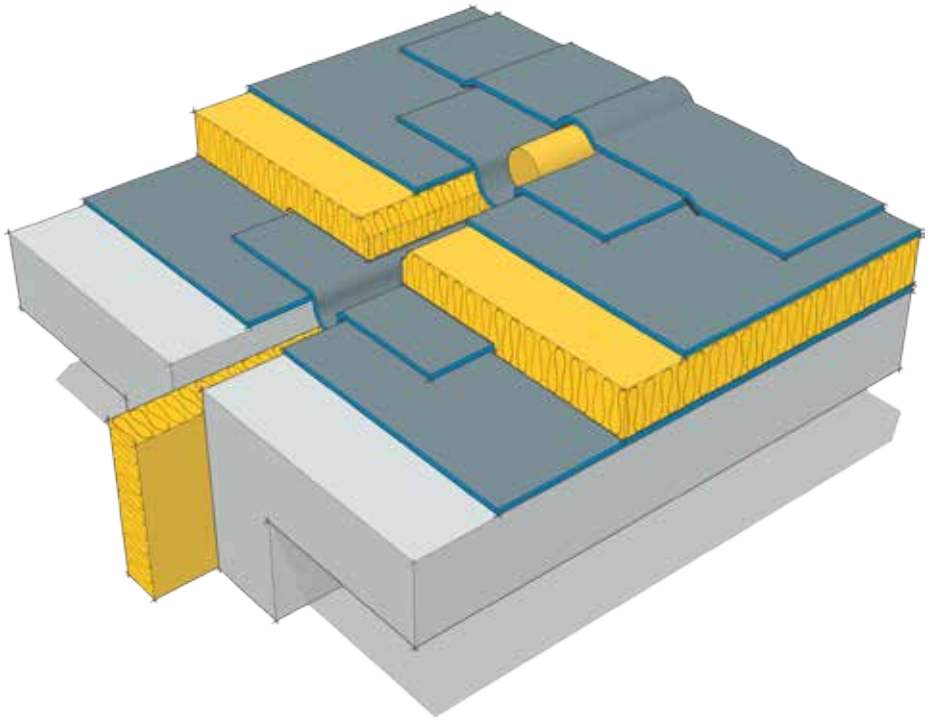
3 Double aerator



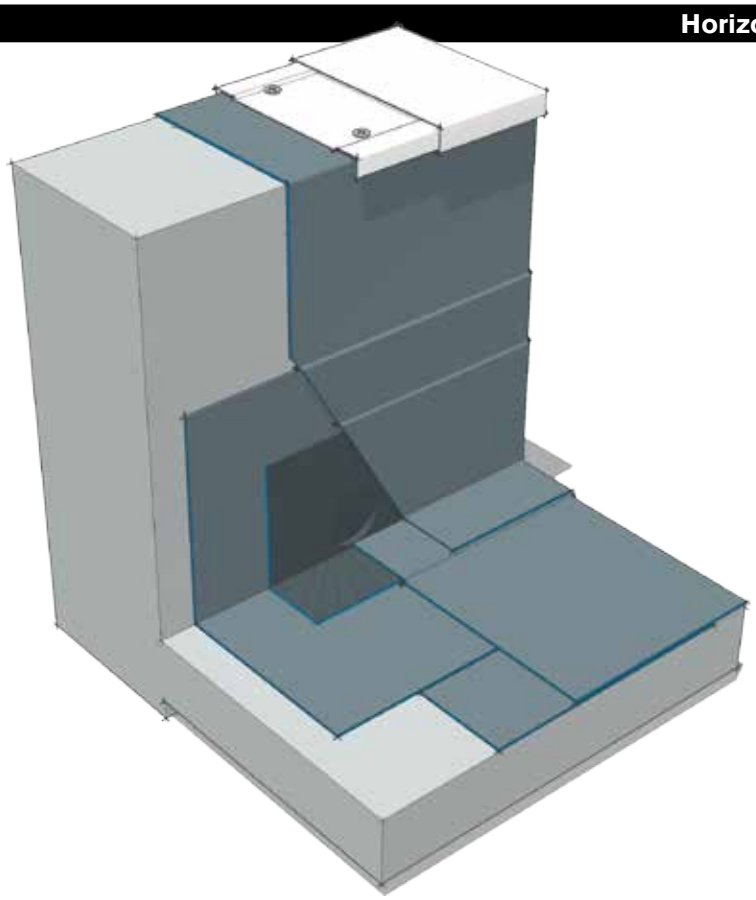
4 Roof joint



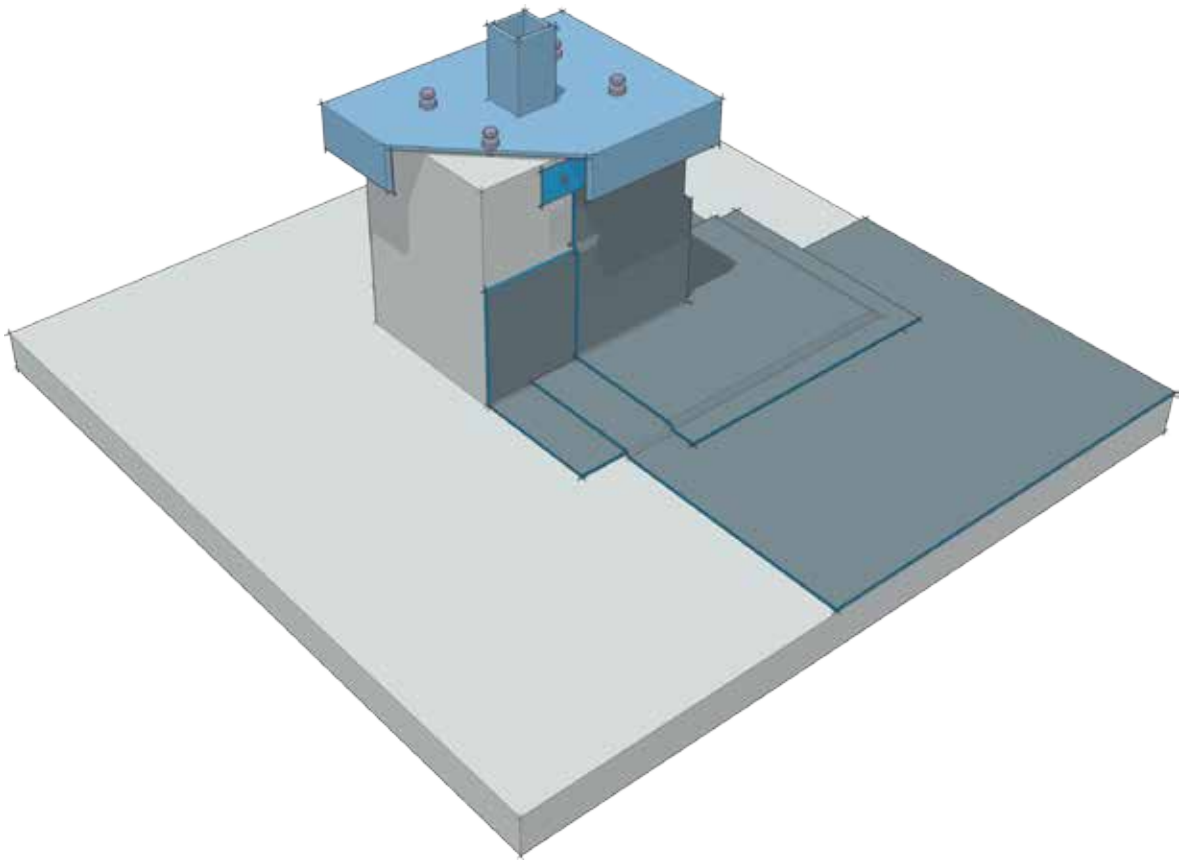
5 Double roof joint



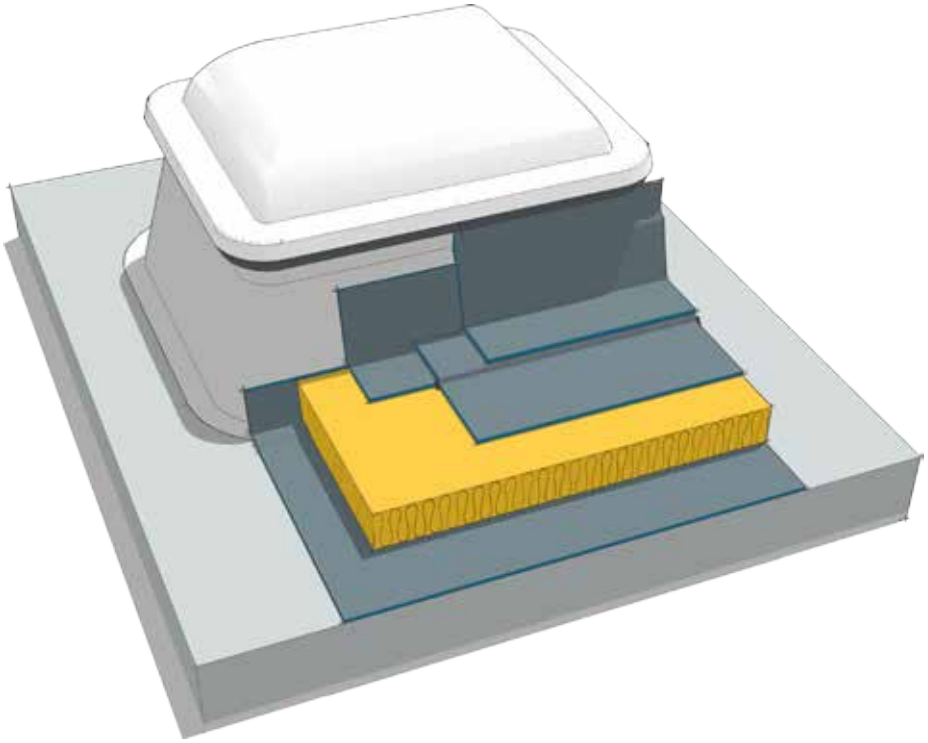
6 Horizontal drain



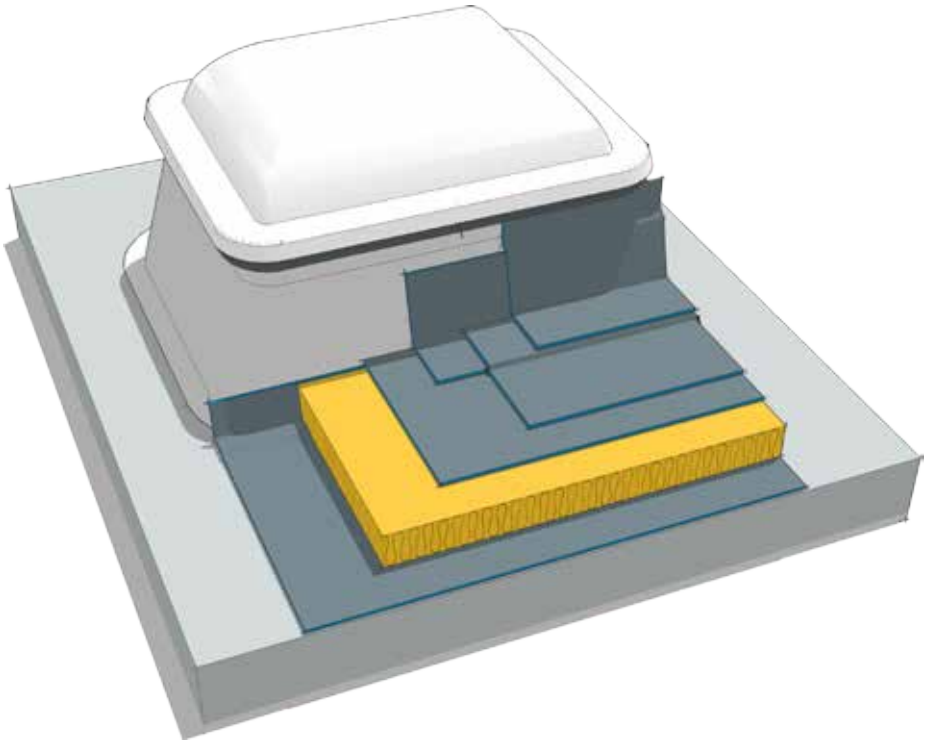
7 U.T.A. support



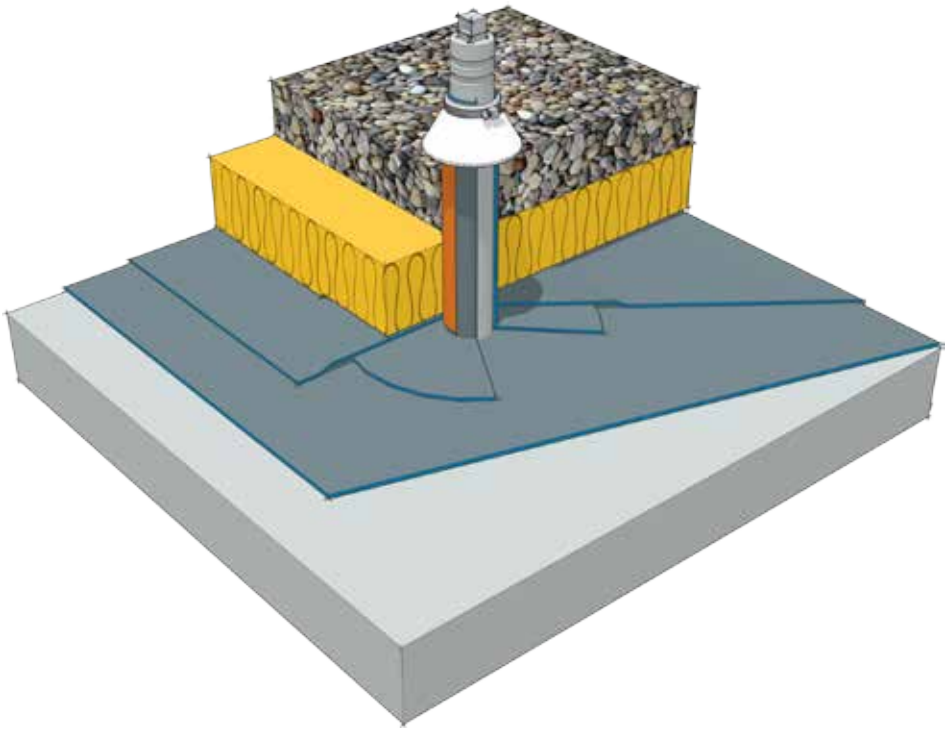
8 Single layer skylight



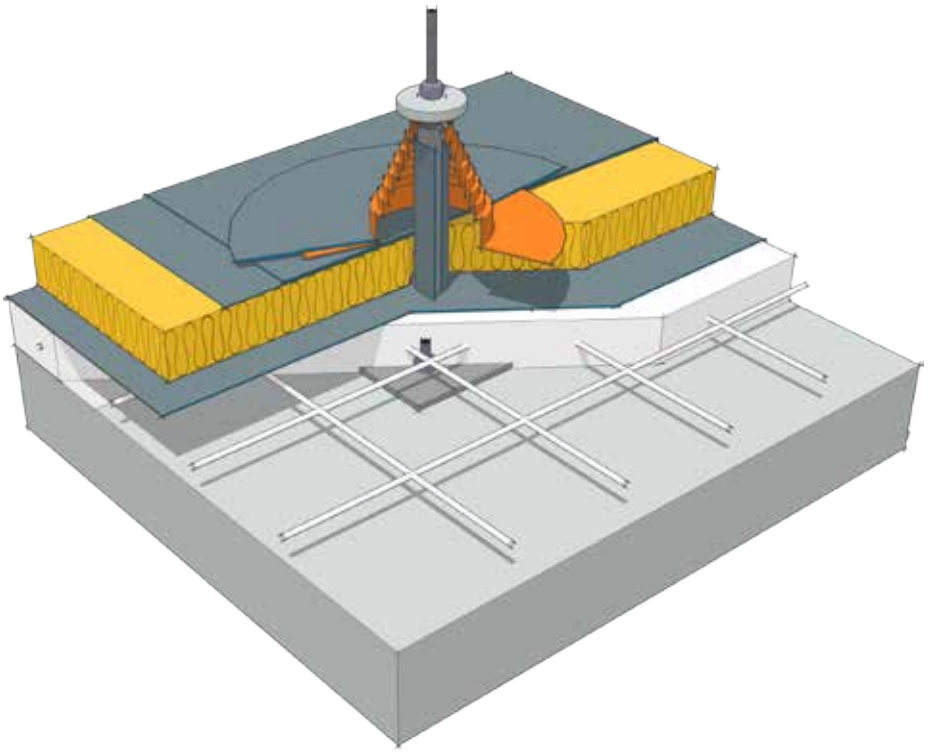
9 Double layer skylight



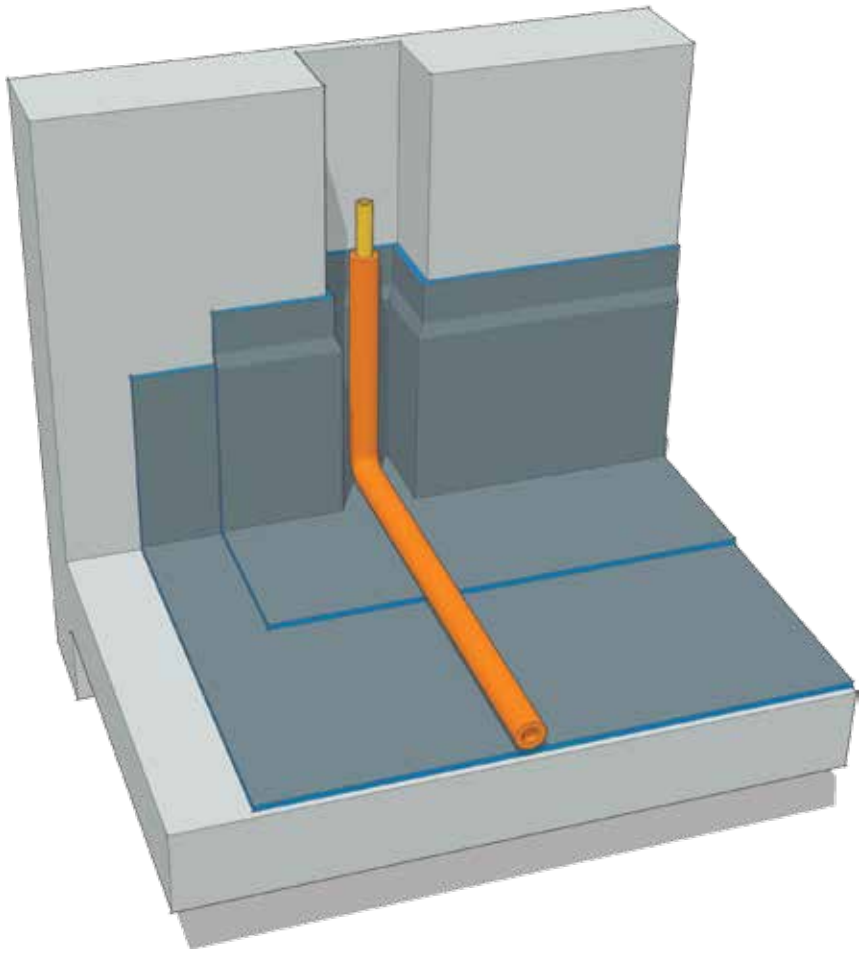
10 Life line rod



11 Photovoltaic system fitting



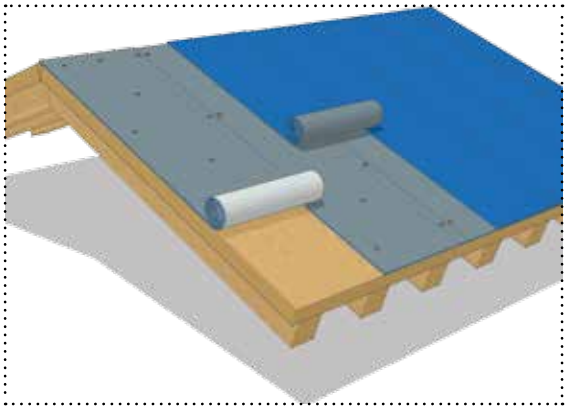
12 Recessed tube



PART APPENDIX
Special torch or hot air applications

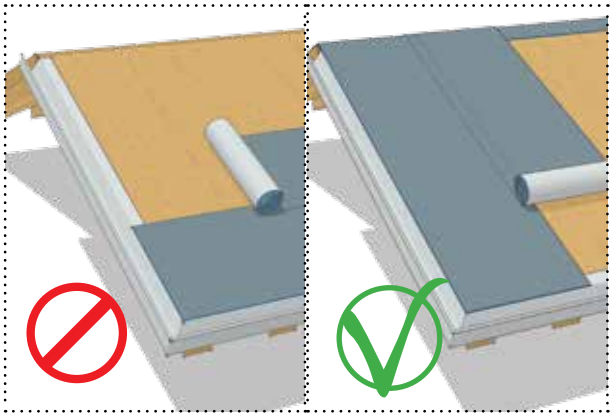
DISTILLED-POLYMER BITUMEN MEMBRANE APPLICATION ON HEAT SENSITIVE & WOOD SUBSTRATES

- For applications on wooden roofs, it is best to place a layer of mono-bitumen between the substrate and the bitumen membrane to act as a fire protection layer; the mono-bitumen layer should be applied loose laid and secured with nails. Continue by fully bonding the bitumen membrane by torch to finish, as indicated in the previous paragraph.
- As an alternative, use an heat activated thermal adhesive membrane that does not require torch application.



DISTILLED POLYMER-BITUMEN MEMBRANE APPLICATION ON SLANTED ROOFS WITH UNDER TILE FUNCTIONS

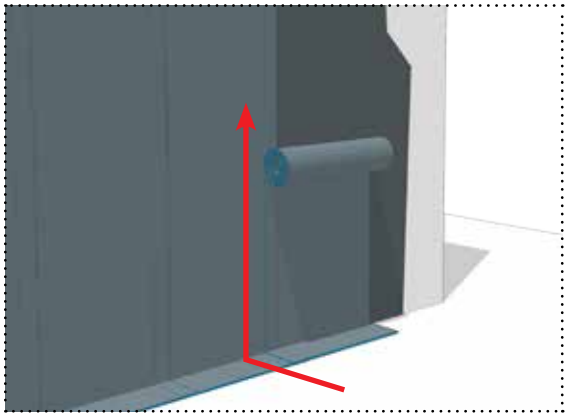
- On ridge, rain and fall lines, waterproofing must be reinforced with distilled polymer-bitumen membrane strips sized 33 cm.
- Place the under tile membrane, unrolling it along the maximum slope line and exceeding the ridge by at least 20 cm.



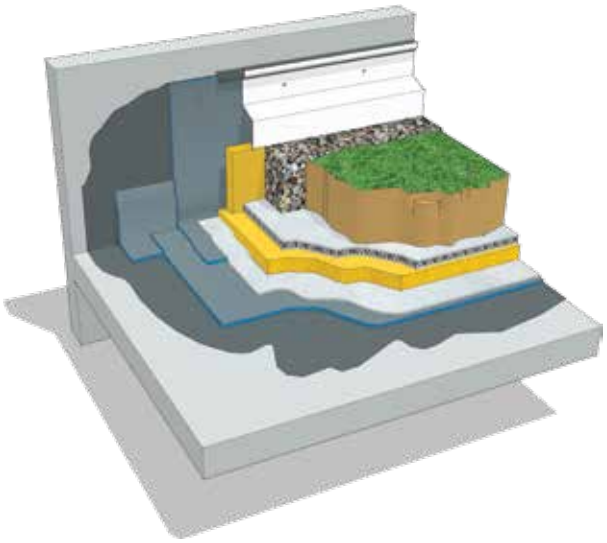
- Apply as indicated in the previous paragraph.
- Install the roof covering (tile, shingles, bitumen tiles, etc.).

DISTILLED POLYMER-BITUMEN MEMBRANE APPLICATION ON CONCRETE VERTICAL WALLS (RETAINING WALLS)

- Apply bituminous primer with a roller or airless, approx. 200/400 gr/m^2.
- Place the rolls to size (the fields should not exceed 3 m) on the installation surface, being careful to mechanically secure the tip of the membrane with a rod and nails.
- Overlap sheet sides by 10 cm and 15 cm on head laps where mechanically secured.
- Fully bond the membrane by heat tempering with a blowtorch or hot air.
- Support the membrane until the compound cools to achieve self-support.
- Apply the embossed polyethylene membrane, with mechanical protection, with embossed side facing out (ground), leaving an excess of about 40 cm at the bottom, mechanically securing the tip of the embossed membrane with a rod and nails.
- Place a drain tube over the excess embossed membrane at the bottom of the excavation.
- Fill after placing a draining material bed over the tube.



DISTILLED POLYMER-BITUMEN MEMBRANE APPLICATION IN ROOF GARDENS

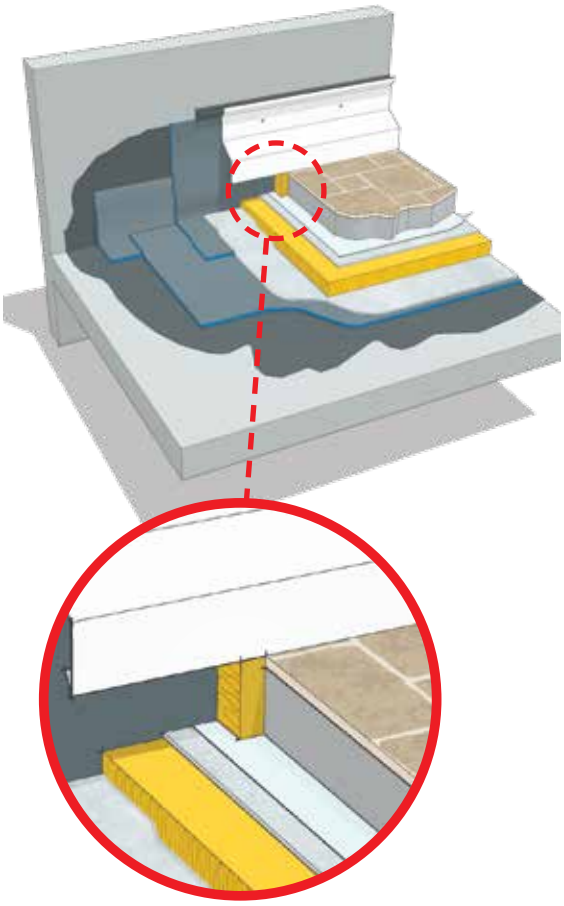


- Use an ANTI-ROOT polymer-bitumen membrane, with special chemical additives (PREVENTOL B2 BAYER) to grant the membrane high resistance to root penetration and aggressive chemical agents such as fertilisers, weed killers, etc.
- The product provides an “anti-root” effect without jeopardising plant life and health in any way.
- Anti-root additives are not washed away by water so the product permanently provides this function.
- Plants such as bamboo, reeds and aggressive hays or high trunk plants or trees are prohibited or discouraged in flower beds or roof gardens.

Other plant species are not suited for roof gardens and the list of plants PROHIBITED by French regulation NF P 84-204-1-1 ANNEX B is provided below.

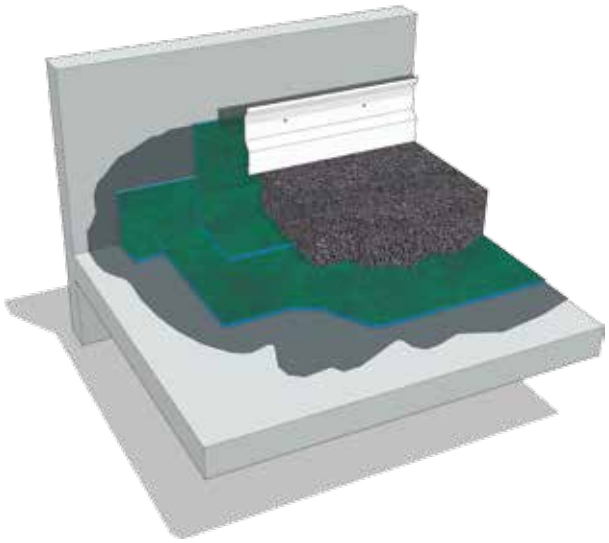
- Bamboo: all varieties.
- Miscanthus and Silver grass.
- Giant aggressive hay; Giant cane, Cord grass.
- Shrubs: Frangula, Black elderberry, Knotweed, Summer lilac, Sandthorn.
- Trees: Willow, Pussy willow, Weeping willow, White poplar, Black poplar, Silver poplar, Canadian poplar, Tree of Heaven, Bald cypress, Pond cypress.
- Evergreens: Acacia, Chestnut, Ash.

DISTILLED POLYMER-BITUMEN MEMBRANE APPLICATION WITH FIXED WALKABLE FLOORS



- In this situation, the waterproofing element cannot be maintenanced, but it is favourably protected from direct sunlight.
- The separation between the waterproofing element and floor, to avoid tangent transmission by friction (due to heat deformations or tangent effects), which could tear the waterproofing element, is guaranteed by the separation release layer (LDPE or equivalent film) and anti-puncture layer (w.n.w. polyester or equivalent).
- The reinforcement in the floor layer must be installed being careful not to hit the waterproofing element.
- Joints filled with collapsible elements must be installed at the perimeter and in protruding bodies to avoid damaging the waterproofing element’s vertical laps.

DISTILLED POLYMER-BITUMEN MEMBRANE APPLICATION ON ROAD DECKS



Use a distilled polymer-bitumen membrane for viaducts to obtain adequate waterproofing, that should have the following requirements:

- also be applicable on uneven surfaces;
- be resistant to temperature changes;
- be elastic;
- be resistant to static puncture meaning load compression;
- have good adhesion to the support before and after ageing;
- be compatible with the asphalt that will be placed on the viaduct extrados. On this topic, remember that the asphalt application temperature is around 130-150 °C, thus waterproofing must support the weight and mechanical effects of both lorries and the finishing machine;
- be easy to repair in the event of damages due to extraordinary viaduct repairs; have a working life equal to the asphalt.

One of the essential waterproofing assumptions for decks is to have the membrane perfectly adhere to the substrate (fully bonded) and scrupulously ensure that there are not areas were adhesion failed.
This could later create problems for the road asphalt, which would tend to detach in time. Furthermore, on descents or curves, membrane detachment would cause the asphalt to buckle due to underlying waterproof element slippage, dragged by heavy vehicle braking.

SAFETY NOTES (PROPANE/BUTANE GAS TORCH APPLICATION):

- Do not use flames near gas ducts, electrical systems, skylights and flammable surfaces like wooden boards, heat sensitive insulation, etc.
- Before turning off the torch, close the gas valve, then, when all gas has left the pipe, close the torch valve.
- NEVER heat the tank; in winter, use appropriate heating bands.
- Pay special attention near air vents and bored holes, to make sure the flame does not enter the building through these.
- Always keep a suitable number of extinguishers at the work site.
- Rubber hoses are only and exclusively used for gas passage. Using the tube as a cord will break the internal reinforcement, causing it to explode.
- Do not rest the hot bell on the rubber hose.
- Always turn off the torch, even for short breaks.
- Keep the tank vertical; secure it so it cannot move on overhangs.

CEMENT AND METALLIC SUPPORT PREPARATION

Bitumen primers modify the physical-chemical surface properties of the underlying layer. In other words, they block cement dust, close pores promoting correct distilled polymer-bitumen membrane adhesion to the support, making them "mandatory" in exposed bitumen polymer membrane applications or in all applications (retaining walls - vertical and raised) where adhesion is a determinant factor in waterproofing success. They can also be used to prepare metallic substrates as a primer or bond layer.

Substrate preparation

- For best results, the surface to be treated must be clean, without oils, grease, detached parts and must be perfectly dry.

Application

- To create an ideal and even application, we recommend a 200-500 gr/m^2 dose (according to the type of substrate). On set cement with straight edge finish, average consumption is 300 gr/m^2.
- Do not exceed recommended primer quantities to avoid large thicknesses that can cause peeling effects between the treated support and bitumen membrane.
- A roller, brush, broom or spray equipment (airless) recommended for large surfaces can be used to apply the bitumen primer.

Recommendations

- Do not apply primer on wet or very damp surfaces.
- Wait until the primer is completely dry before applying the bitumen membrane.
- Drying time varies according to the temperature: at 20 °C, drying time is 120 minutes for solvent primers on average. For water-based primers, drying time in direct sunlight is 180 minutes at 20 °C or 180 minutes in other conditions.
- For solvent primers, ensure forced ventilation when applying indoors.
- Do not apply at temperatures under 5 °C, in fog or high humidity or before rain.
- Clean tools with aromatic solvents.

PAINT AND VARNISH WITH LIGHT PROTECTION FUNCTIONS FOR WATERPROOFING WITH EXPOSED DISTILLED POLYMER-BITUMEN MEMBRANE

Their purpose

To protect the bitumen membrane from deterioration due to the weather, UV rays and temperature changes.

Support preparation

- Wait until the light bitumen and polymer parts migrate to the surface due to sunlight which then transform into water soluble products and act as a detachment substance. This may vary between 2 and 6/8 months. This phenomenon is more frequent on flat roofs since puddles and stagnated water forms without correct self-cleaning like on slanted roofs.
- Other factors not to be overlooked are the sand or powder used as non-stick finishes on membranes, smog deposits, etc.
- Waiting for the entire indicated period may not be sufficient. At time the roof may require cleaning with water and detergents (10% sodium phosphate solutions); with caution, low pressure washers can be used.
- After cleaning, we recommend waiting at least 2/3 days before painting.
- The above wait times before painting are not required when using membranes with a polypropylene mat finish on the upper face since they do not require any preparations.

Application

- Apply two coats of paint, preferably intersecting, consuming between 200 and 400 gr/m^2 according to the type of support: for a smooth black membrane about 100/150 gr/m^2 will be consumed per coat, for a slate membrane, 200/250 gr/m^2 per coat.
- Do not exceed the recommended paint quantities to avoid peeling effects or, worst case scenario, MUD CRACKING.
- High solvent paint thickness does not allow for even paint drying; the thickest layer will tend to soften the bitumen, scaling (due to the high thickness) also effecting the bitumen compound.
- Use a roller, brush, broom or spray equipment (airless recommended for large surfaces).

Recommendations

- Even if paint is generally ready for use, we recommend you always mechanically mix the product (drill with mixer).
- Do not apply paint on wet or very damp surfaces.
- Wait until the first paint coat is fully dry before applying the second coat (drying time may vary according to temperature: at 20 °C, drying time is 6 hours on average).
- Do not paint at temperatures under 5 °C, in fog or high humidity or before rain.
- Do not paint during the hottest hours of the day, to prevent the excessively hot membrane from accelerating the paint film process, triggering poor adhesion.
- Paint or varnish cannot be walked on except for ordinary roof maintenance.
- Clean tools with hot water for water based paint and with aromatic solvents for solvent based paints.

Paint duration

- Duration is conditioned by many factors (UV, temperature, smog, pollutants, water stagnation on the surface).
- Even the heat insulation element under the roof effects roof working temperature, thus the paint.
- It is extremely difficult to determine the duration of paint on a roof. The only certainty is that paint will last less than the waterproofing surface thus it must be periodically maintained (ordinary maintenance).

White reflective paints for Cool Roofs

- In addition to extending roof life, the special innovative VOLTAIKA white reflective paint finish reduces the exterior and interior building surface temperatures with significant energy consumption savings.
- Furthermore, high emissivity promotes the dissipation of heat accumulated over night.

Advantages

- Emissivity and light reflection: VOLTAIKA reflects and increases diffused and direct light, increasing photovoltaic system yield.
- Excellent VOLTAIKA emissivity promotes the dissipation of heat accumulated over night.

Temperature

- Significantly reduces the temperature.
- In the summer, the temperature of a black membrane is about 75-79 °C. The temperature of a membrane coated with VOLTAIKA in the same period is 45 °C. The temperature in the intrados drops by at least 5 °C, with significant air conditioning cost savings.
- A roof with a coat of VOLTAIKA is a “cool roof”, thus able to reflect incident solar radiation and with high intrados emissivity values, allow the roof to return most the absorbed solar radiation to the air through heat radiation.

SURFACE MAINTENANCE AND CARE

[Taken from the "Programmed maintenance manual"]

MAINTENANCE

The purpose of waterproofed roof maintenance is to ensure it maintains its main characteristics in time such as:

- correct rain water removal;
- waterproofness;
- durability.

Scheduled maintenance will allow the roof to reach its maximum waterproofing potential over its working life. Maintenance is thus essential and should also be planned for insurance purposes.

Surface waterproof system maintenance.

- The surface waterproofing system is designed according to building use.
- Should use vary, analyse current system conditions to ensure practicality and make necessary changes to suit the new use.

SURFACE MAINTENANCE GUIDE

Have maintenance personnel inspect the surface at least once a year.

1. Inspection includes removing all waste and deposits, especially around drains (gutters, overflow, grooves, etc.).
   Stagnated water on the roof often negatively affect the working life. This occurs for many reasons: in fact stagnation increases the static overload, promoting the growth of vegetation and inducing potentially hazardous stress in alternating freezing/defrosting cycles.
   Also keep in mind that stagnated water creates environments favourable to mould, bacteria and micro-organism growth which can also become aggressive from the chemical and physical standpoints (mud cracking).
2. If the system is protected with varnish or paint, periodic touch-ups are required.
3. Any cut or tear repairs on the system must be performed and/or coordinated by the contractor who installed the roof.
4. Companies other than roof maintenance companies, who work on the roof for different reasons must take all the necessary measures and caution to avoid damaging the surface (i.e.: falling objects, dragging materials, solvent or lubricant leaks, etc.).
5. If there are pass-through holes on the roof, areas not waterproofed with membrane must be filled with bituminous non-shrink stable mastic while the upper part must be completed and crowned with the use of straps or special protective caps.
6. If the roof is walkable, it is recommended to install floating floors on specific support feet.
   Avoid securing ducts or cables directly on the membrane, anchoring these parts to brick elements or seek advice from specialised personnel.
7. We recommend creating protected pathways to air conditioning units and machinery or elements requiring maintenance in general.
   This can be achieved with an appropriate floating floor, inserting a 200 gr/m^2 polyester or polypropylene non fabric layer.
   We recommend specific elevated platforms for machinery to permit maintenance or inspections of the underlying waterproofing membrane.

MAIN CHECKS

DRAINS

- Drains can be the cause of potential leaks. When inspecting the surface, remove debris from gutters to ensure rain water evenly flows to drain pipes.
- When debris accumulates in gutters, water flow slows causing accumulation and flows over unforeseen paths.
- The best time to inspect the surface, with special focus on drains and rain pipes, is in the autumn, after leaves fall.

WATER STAGNATION

- Check for an improper water draining.

GUTTERS

These are the metal or other rigid material gutters that protect the membrane near verticals like, for example, expansion joints, ridge covers, sun bands.
When inspecting the ends of the roof, check for:

- any missing or loose fasteners;
- any missing or loose joint covers;
- rust on metallic parts;
- bond cracks and/or ageing that could collect and direct water through end joints.

PASS-THROUGH ITEMS

- Pass-through items are pipes, drains, wire raceways, conduits and curbs.
- The improper addition of these items after original waterproofing system installation may cause severe damages to the waterproofing system and thus the entire building. When additional accessories need to be installed after the waterproofing system is completed, only specialised personnel is authorised to cut, remove and bond the pre-existing surface.
- These pass-through items should be secured using gutters to ensure correct bond and waterproofing.
- Non-waterproofed areas around pass-through items should be filled with a sufficient amount of bituminous mastic. Also inspect and ensure that the membrane fully adheres to the rising item flange.

MEMBRANE CHECKS ON MAIN PARTS

The flat roofing surface is then inspecting, checking for damages due to:

- debris whose movement could damage the membrane;
- any metallic machinery panels on the surface, placed on the flat surface, which could puncture or cut the membrane during inspection and repairs.
- Look for the following defects during inspections: cracks, open joints, membrane or surface lining deterioration, potential membrane stains or holes, partially detached areas, excessive folds, bubbles or ridges. Also check membrane fastening element and support integrity and that water is adequately drained.
- When cleaning the membrane on the surface, avoid using high pressure washers on the membrane which could damage joints.

MEMBRANE REPAIRS

- The membrane surface should be clean and dry before installing a membrane patch by heat tempering with blowtorch or hot air.
- If these products are not available, use bituminous mastic sealant until the contractor can perform permanent repairs.

LEAKS NEAR METALLIC GUTTERS

- Loose or missing fasteners should be correctly secured or replaced. Bonding near metallic gutters could deteriorate in time, due to ageing, requiring the application of bituminous mastic sealant.
- Structural movements could cause sudden gutter deformations, generating openings in the surface that could channel water through joints in the building. Accurately inspect exposed membrane sections where this phenomenon could occur.

Data

Cantiere

Note

Ordinare

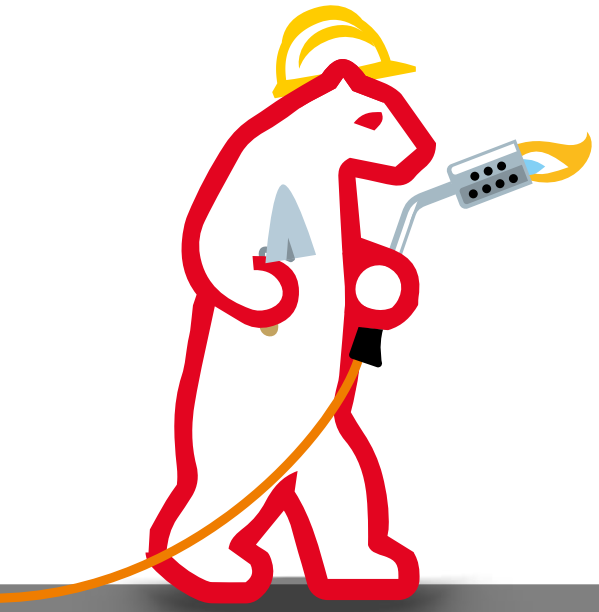
Data

Cantiere

Note

Ordinare

Nord Bitumi
SINCE 1967



INSTALLATION MANUAL

Distilled bitumen-polymer membrane application

GCAL / 1 / 10-2019/ 1000

Nord Bitumi SINCE 1967

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