Concrete access decks

For pedestrian & vehicle traffic

Main area and upstand descriptions

Siplast

Waterproofing systems for pedestrian and vehicle access decks on concrete substrates

Concrete access decks
For pedestrian & vehicle traffic

Contents

Attention : the information herein is a general guideline, but does not take into account restrictions or special instructions related to the bearing element, to certain insulations, to the geographical location, to the structural configuration, etc.

This information does not relieve the professionals from obtaining full knowledge of the reference documents (prevailing Local Technical Standards, Technical Assessments, Installation Specifications, etc.) This entails consulting them in their integral textual form.

Again this document is only a guide; Siplast-Icopal reserves the right to modify the composition and the installation instructions of its products, depending upon the evolution of knowledge and technology.

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Concrete access decks
For pedestrian

Siplast

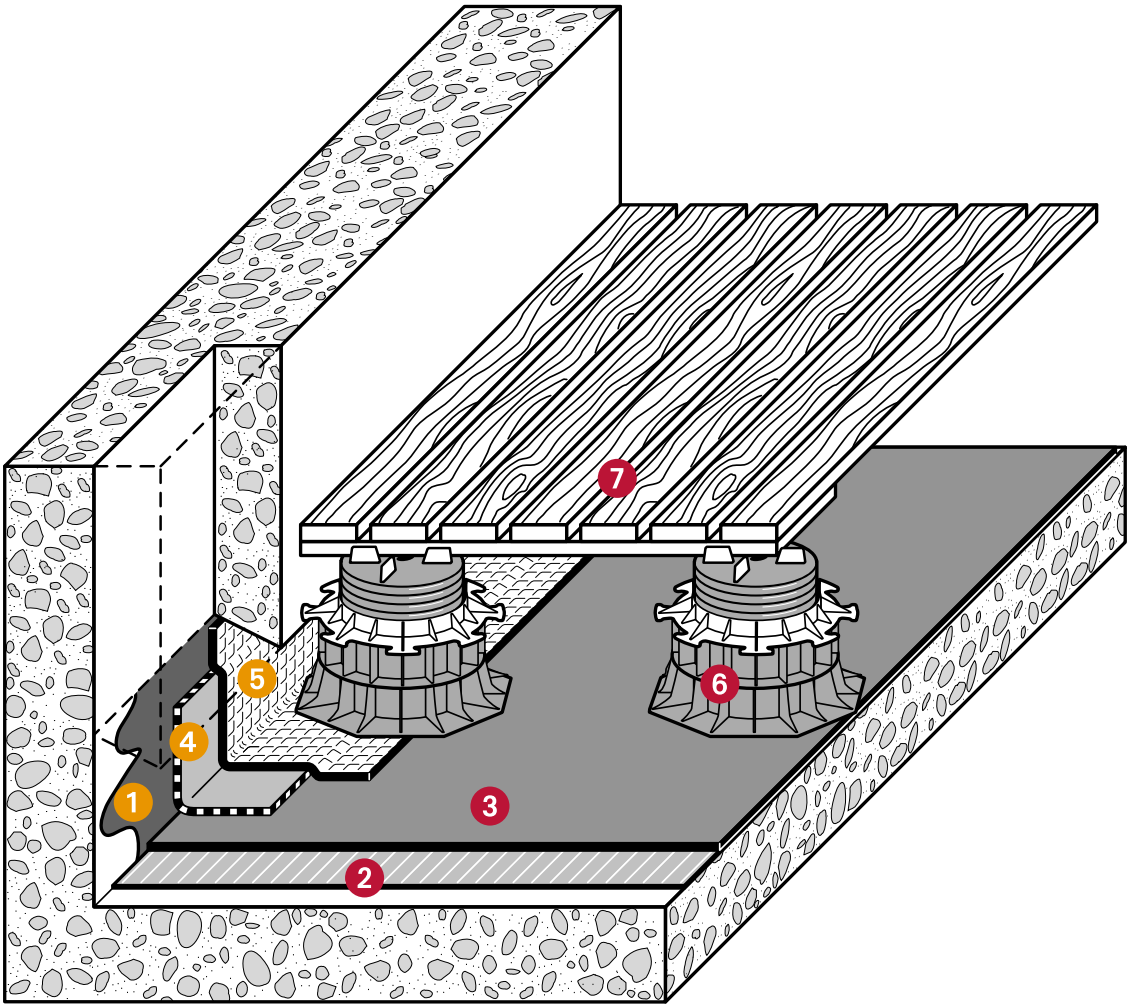
3.1 **Concrete**

Pedestrian roof terraces with paving support | On substrate (without insulation)

Loose-laid SBS elastomeric bitumen single-layer waterproofing system with double joint

Teranap JS + Plot Zoom

Slope
0 to 5%



1. Upstands: Siplast Primer SBS bitumen primer.
2. Loose-laid Verecran 100 separating underlay.
3. Loose-laid Teranap JS single-layer + torched covering strip.
4. Upstands: torched Parequerre reinforcement angle.
5. Upstands: torched aluminium-faced Paradial S top-layer.
6. Plots Zoom adjustable paving supports.
7. Paving tiles: Dalle Boise timber decking tile (or concrete tiles).

Concrete access decks
For pedestrian

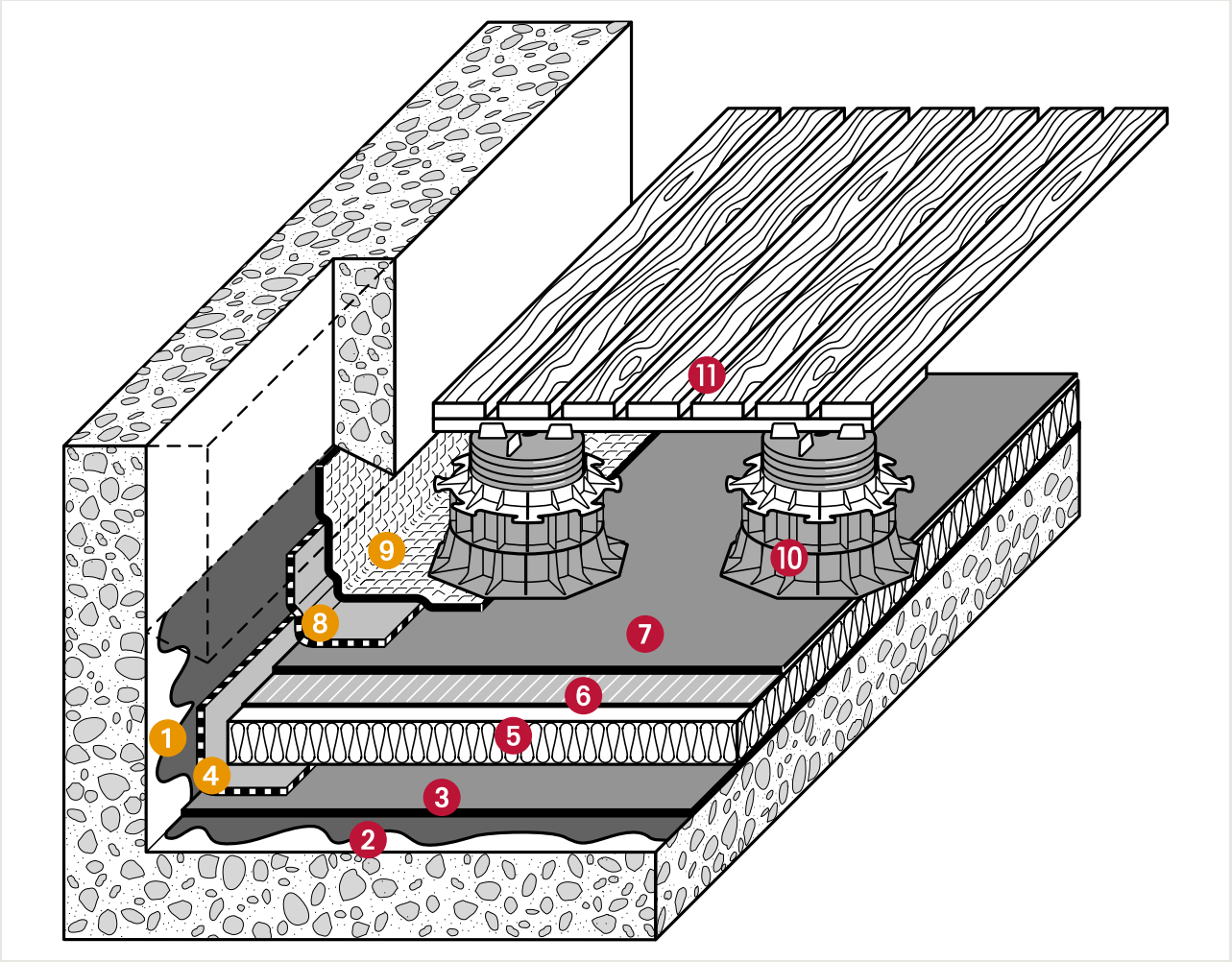
3.2 **Concrete**

Pedestrian roof terraces with paving support system | On flame sensitive insulation board

Loose-laid SBS elastomeric bitumen single-layer waterproofing system with double joint

Teranap JS + Plot Zoom

Slope 0 to 5%



1. Upstands: Siplast Primer SBS bitumen primer.
2. Siplast Primer SBS bitumen primer onto concrete substrate.
3. Irex Profil vapour control layer (VCL)*.
4. Upstands if VCL: torched Parequerre reinforcement angle or VCL upstand.
5. Insulation board: expanded polystyrene boards, polyurethane or polyisocyanurate boards with fibre reinforced facing, expanded perlite + fiber board, composite perlite + resol board, foamglass board with bitumen surfacing.**
6. Loose- laid Verecran 100 separating underlay.
7. Loose-laid Teranap JS single-layer + torched covering strip.
8. Upstands: torched Parequerre reinforcement angle.
9. Upstands : torched aluminium-faced Paradial S top-layer.
10. Plots Zoom adjustable paving supports.
11. Paving tiles: Dalle Boise timber decking tile (or concrete tiles).

* VCL is not necessary in tropical or equatorial regions when buildings are not heated

** Consult the supplier's technical documentation and local regulations for compliance with all building and security requirements. The insulation boards are held by 1 or 2 mechanical fixations, see supplier's installation manual.

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Concrete access decks
For pedestrian

Siplast

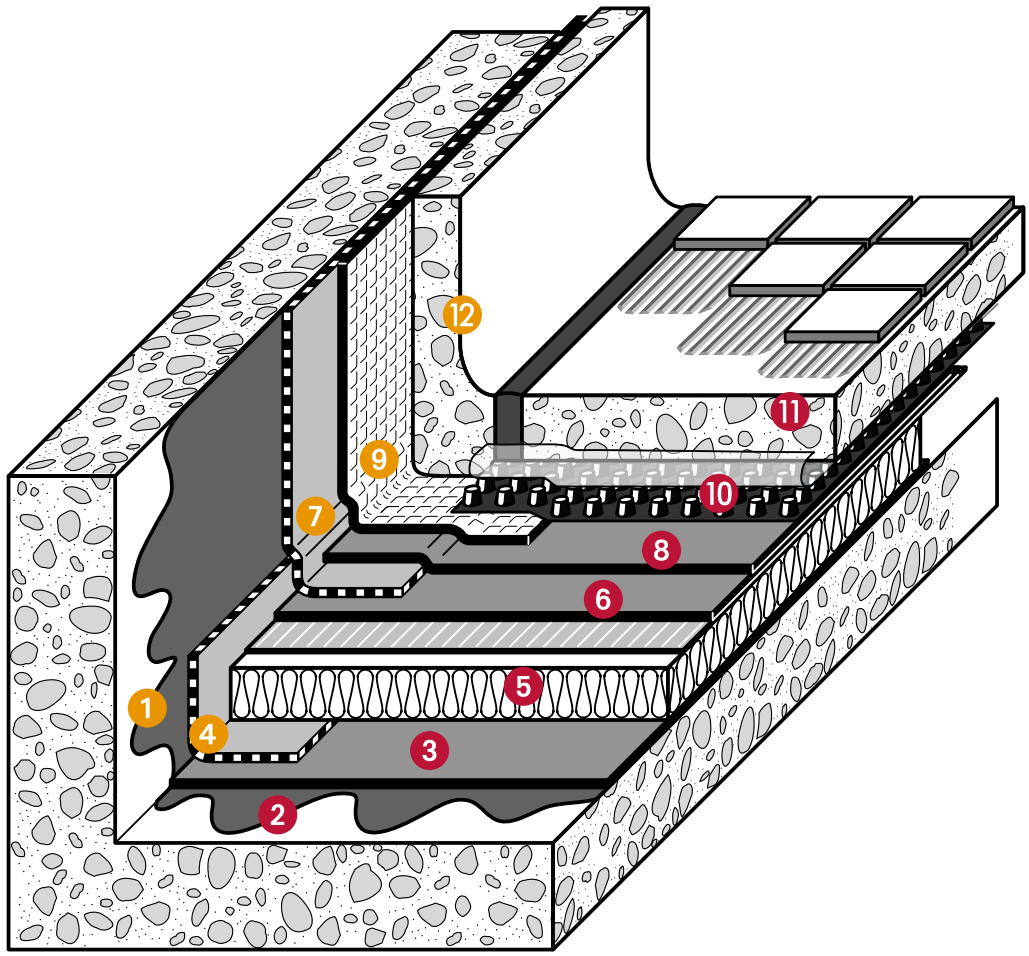
3.3 Concrete

Pedestrian roof terraces with paving tiles on cement screed | On flame sensitive insulation board

Torch-applied SBS elastomeric bitumen double-layer waterproofing system

Paradiene JS R4 + Paradiene S VV + Draina G10

Slope 1.5% to 5%



1. Upstands: Siplast Primer SBS bitumen primer.
2. Siplast Primer SBS bitumen primer onto concrete substrate.
3. Irex Profil vapour control layer (VCL).*
4. Upstands if VCL: torched Parequerre reinforcement angle or VCL upstand.
5. Insulation board: expanded polystyrene boards, polyurethane or polyisocyanurate boards with fibre reinforced facing, expanded perlite + fiber board, composite perlite + resol board, foamglass board with bitumen surfacing.**
6. Loose-laid Paradiene J SR4 underlayer + torched overlaps.
7. Upstands: torched Parequerre reinforcement angle.
8. Torched Paradiene S VV top-layer.
9. Upstands : torched aluminium-faced Paradial S top-layer.
10. Draina G10 drainage embossed underlay (loose laid).
11. Heavy cement screed.
12. Upstand with wire mesh cement mortar.

* VCL is not necessary in tropical or equatorial regions when buildings are not heated

** Consult the supplier's technical documentation and local regulations for compliance with all building and security requirements. The insulation boards are held by 1 or 2 mechanical fixations, see supplier's installation manual.

Concrete access decks

For vehicle traffic

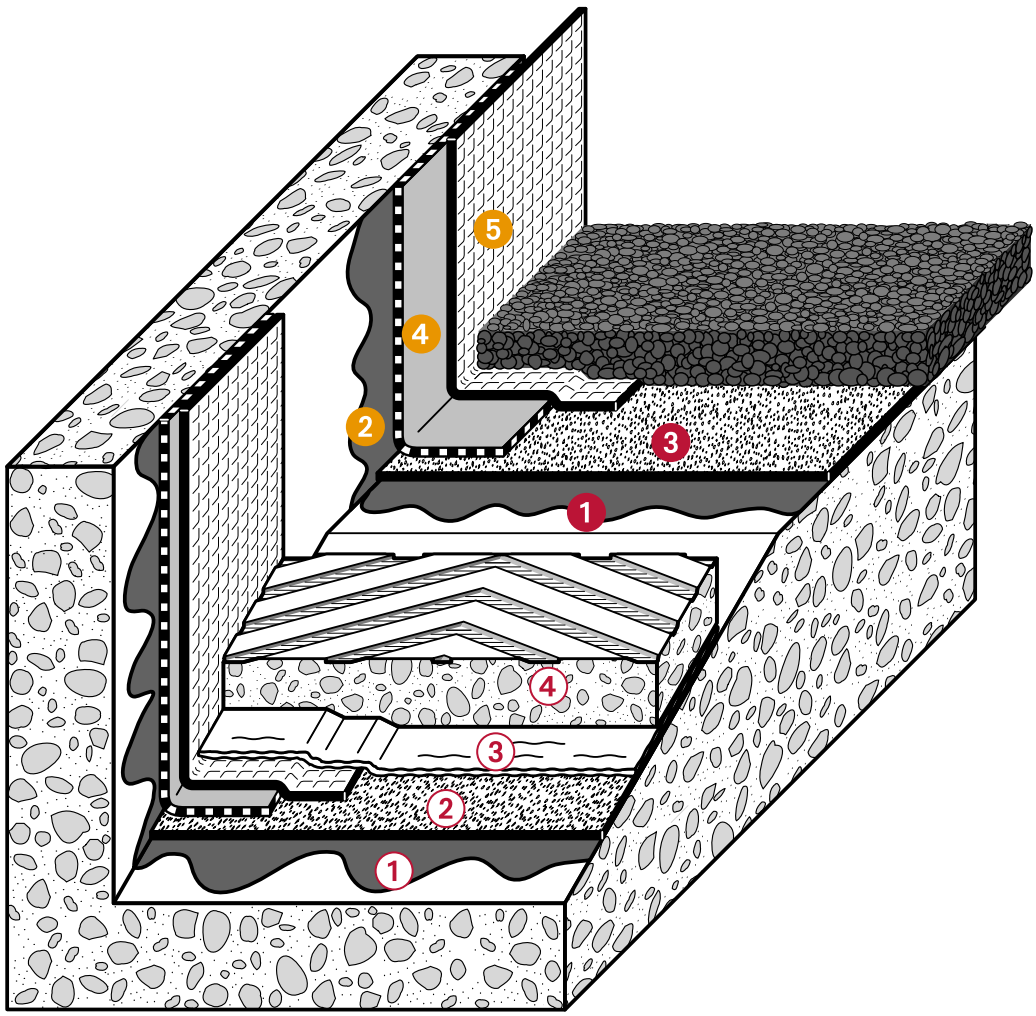
3.4 **Concrete**

Car park terraces – macadam bitumen/rolled asphalt paving | On substrate (without insulation)

Heat-activated adhesive bitumen single-layer waterproofing system

Thermosolo GS

Slope 2% to 5%



1. Siplast Primer SBS bitumen primer onto concrete substrate.
2. Upstands: Siplast Primer SBS bitumen primer.
3. Thermosolo GS single layer with heat-activated strips for partial bonding + torched overlaps.
4. Upstands: torched Paradiene 35S R4 reinforcement angle.
5. Upstands: torched Verinox S or Parafor Solo GS top-layer.

Car access ramp

1. Siplast Primer SBS bitumen primer onto concrete substrate.
2. Fully torched Parafor Solo GS single layer.
3. Separating layer.
4. Reinforced concrete slab.

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Concrete access decks
For vehicle traffic

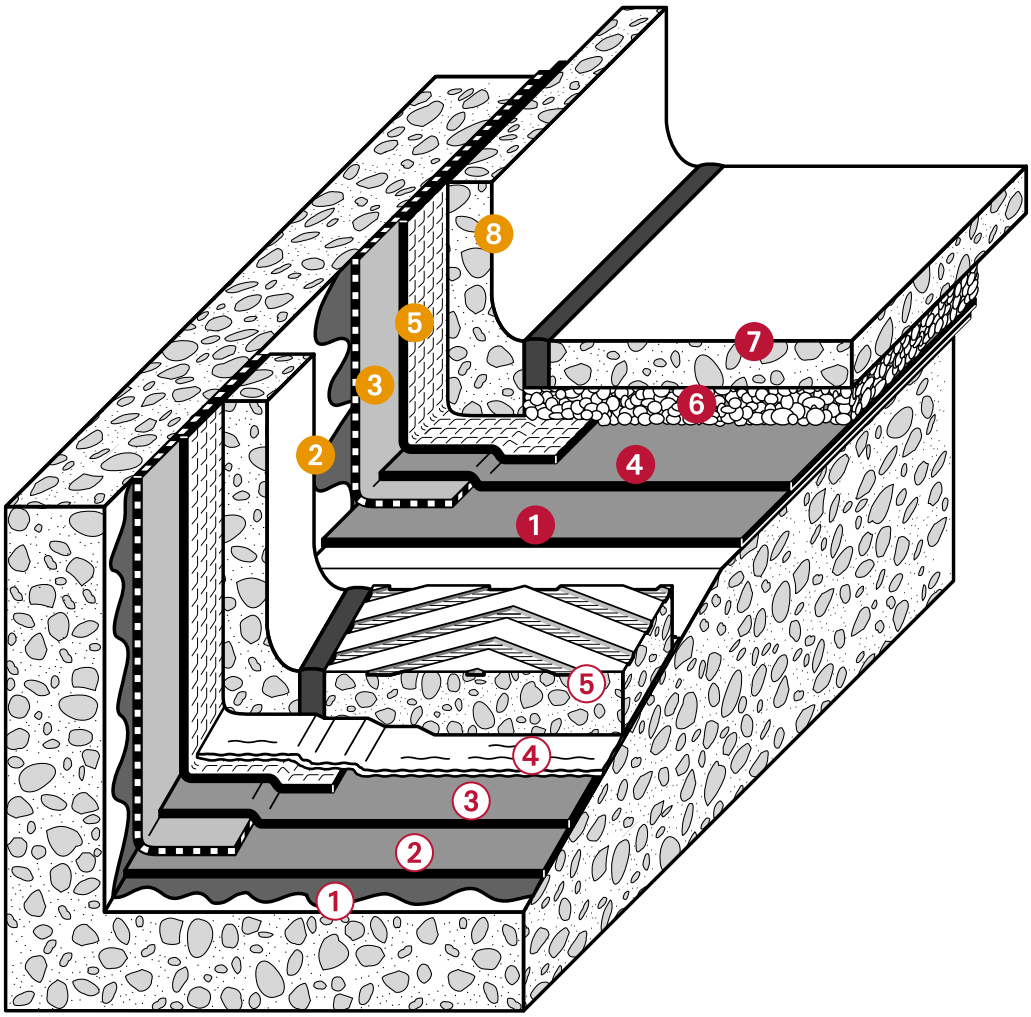
3.5 **Concrete**

Car park terraces – reinforced concrete slab | On substrate (without insulation)

Torch-applied SBS elastomeric bitumen double-layer waterproofing system

Paradiene JS R4 + Paradiene S VV

Slope 2% to 5%



1. Free-laid Paradiene J SR4 underlayer + torched overlaps.
2. Upstands: Siplast Primer SBS bitumen primer.
3. Upstands: torched Paradiene 35S R4 reinforcement angle.
4. Torched Paradiene S VV top-layer.
5. Upstands: torched aluminium-faced Paradial S top-layer.
6. Drainage layer: Gravifiltre geotextile + 30 mm gravel 5/15 + Gravifiltre geotextile.
7. Reinforced concrete slab.
8. Upstand with wire mesh cement mortar.

Car access ramp

1. Siplast Primer SBS bitumen primer onto concrete substrate.
2. Torched Paradiene 35S R4 underlayer.
3. Torched Paradiene S R4 top-layer.
4. Separating layer: geotextile.
5. Reinforced concrete slab.

Concrete access decks

For pedestrian with planted areas

3.6 **Concrete**

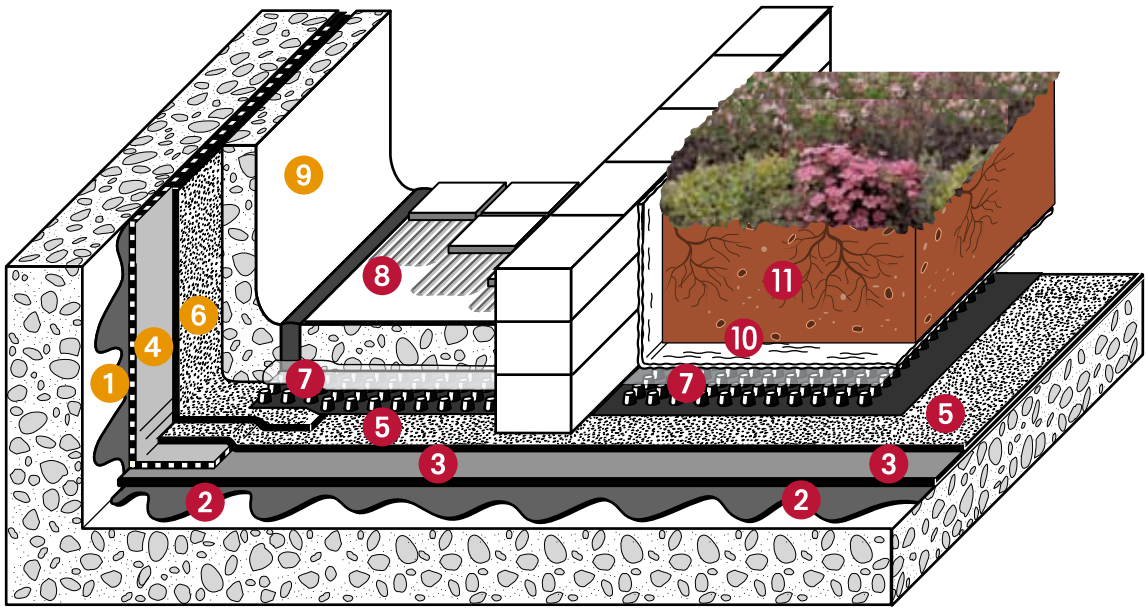
Multi-purpose terrace with pedestrian access and planted areas

On substrate (without insulation)

Torch-applied SBS elastomeric bitumen double-layer waterproofing system

Preflex + Graviflex

Slope 1% to 5%



Pedestrian access

1. Upstands: Siplast Primer SBS bitumen primer.
2. Siplast Primer SBS bitumen primer onto concrete substrate.
3. Torched Preflex underlayer + torched overlaps.
4. Upstands: torched Preflex reinforcement angle.
5. Torched Graviflex top-layer.
6. Upstands: torched Graviflex S top-layer.
7. Draina G10 drainage embossed underlay (loose laid).
8. Heavy cement screed.
9. Upstand with wire mesh cement mortar.

Planted area

2. Siplast Primer SBS bitumen primer onto concrete substrate.
3. Torched Preflex underlayer + torched overlaps.
5. Torched Graviflex top-layer.
7. Draina G10 drainage embossed underlay (loose laid).
10. Loose-laid Gravifiltre filter geotextile.
11. Soil and Landscaping.

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Concrete access decks
For vehicle traffic with planted areas

3.7 **Concrete**

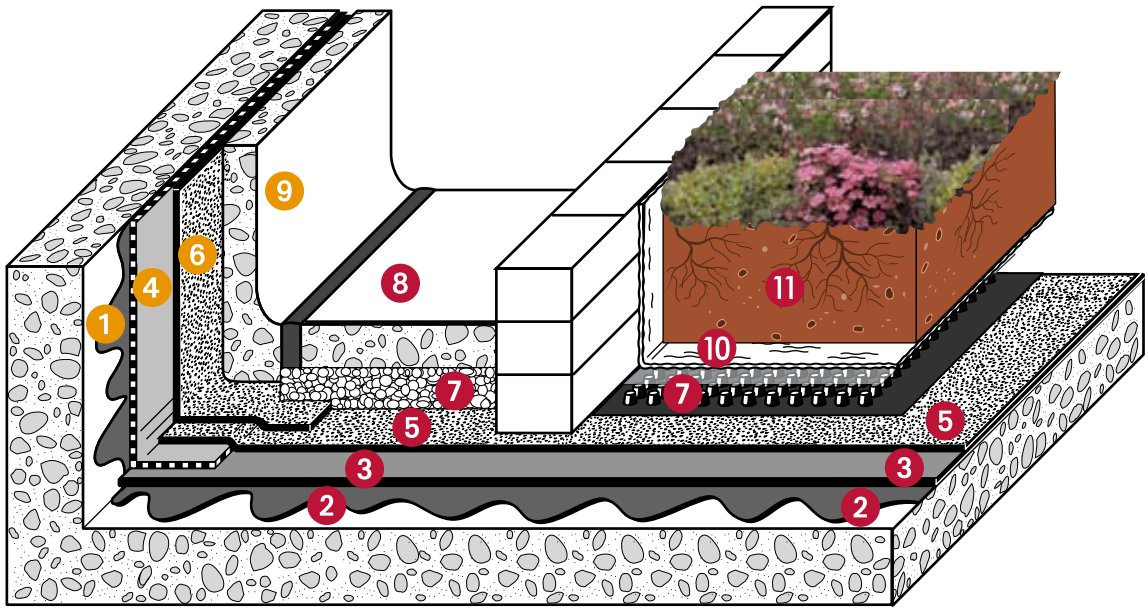
Multi-purpose terrace with vehicle traffic and planted areas

On substrate (without insulation)

Torch-applied SBS elastomeric bitumen double-layer waterproofing system

Preflex +Graviflex

Slope 2% to 5%



Vehicle traffic

1. Upstands: Siplast Primer SBS bitumen primer.
2. Siplast Primer SBS bitumen primer onto concrete substrate.
3. Torched Preflex underlayer + torched overlaps.
4. Upstands: torched Preflex reinforcement angle.
5. Torched Graviflex top-layer.
6. Upstands: torched aluminium faced Paradial S top-layer.
7. Drainage layer: Gravifiltre geotextile + 300 mm gravel 5/15 + Gravifiltre geotextile.
8. Reinforced concrete slab.
9. Upstand with wire mesh cement mortar.

Planted area

2. Siplast Primer SBS bitumen primer onto concrete substrate.
3. Torched Preflex underlayer + torched overlaps.
5. Torched Graviflex top-layer.
7. Draina G10 drainage embossed underlay (loose laid).
10. Loose-laid Gravifiltre filter geotextile.
11. Soil and Landscaping.

Concrete access decks
For pedestrian

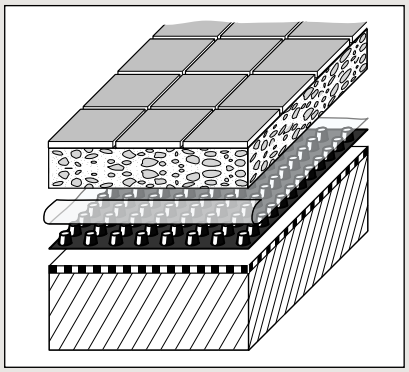
Different types of paving for pedestrians

Information for calculation of permanent loads

Sand bed:	0.60kN/m² for a 0.03m thickness
Ballast 3/15:	0.60kN/m² for a 0.03m thickness
Mortar or concrete screed:	1.00kN/m² for a 0.04m thickness
Concrete slab:	1.25kN/m² for a 0.05m thickness
Timber decking tiles Dalle Boise HR 56:	0.22kN/m²
Pavers, interlocking or not:	1.50kN/m² for 0.06m thick

Note: 1kN ≈ 100kg

Mortar or concrete screed, poured on-site + bedded or bonded floor covering



Bedded or bonded floor covering: in principle, not laid by the waterproofing contracting firm .

Mortar or concrete screed: thickness minimum 0.04m, proportioned and mixed with plasticiser – water reducing agent.

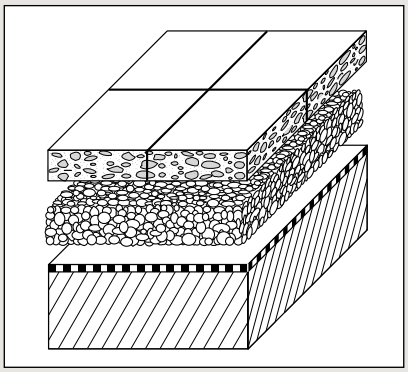
Separating layer: 0.03 m of aggregate 3/15 + non-woven Gravifiltre or Draina G 10, unrolled with overlap on 3 pedestals, if S ⩽ 30 m²: non-woven Gravifiltre + synthetic film 100µ.

Subdivision of hard ballast:

- Joints 20mm minimum next to reliefs and convex features.
- Joints 10-20mm every 4m maximum (for maximal surfaces of 10 m²).
- Joints packed with rot resistant system and capable of alternating deformations.
- Any reinforcement of the concrete to be interrupted next to each joint.

The floor covering can be replaced by tiles on pedestals (Plot Zoom) such as timber decking tiles Dalle Boise HR 56 or concrete tiles (0.40m mini).

Prefabricated slabs of cement concrete or of hard stone, laid mortarless with tight joints or wide joints



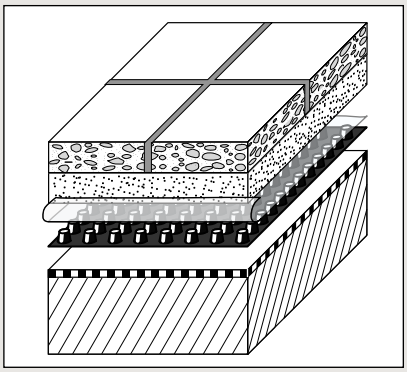
Slabs: precast concrete or hard stone (thickness ⩾ 0.04m; length/ width from 0.25 to 0.50m) wide joints, 0.02m approximately, filled with mortars, or tight joints.

Isolating layer: 0.03 m of aggregates 3/15 (or of sand in case of laying with wide joints), if S ⩽ 30 m²: non-woven Gravifiltre + synthetic film 100µ.

Subdividing hard ballast:

- Joints 20mm minimum every 6m maximum, and at reliefs and convex features.
- Packing of joints with rot resistant system and capable of alternating deformations.

Precast slabs of cement concrete or of hard stone, laid on mortar, with wide packed joints



Slabs: precast concrete or hard stone (thickness ⩾ 0.04m; length/width from 0.5 to 0.50m), joint between slabs 20mm approximately, filled with mortar.

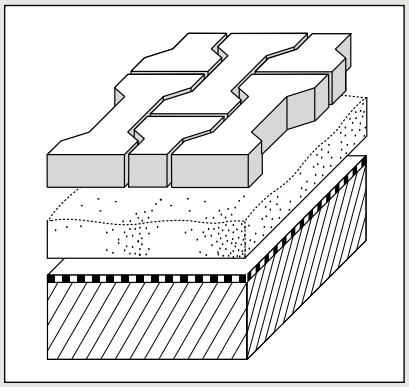
Cement mortar: thickness 0.03m, proportioned and mixed with plasticiser – water reducing agent.

Isolating layer: 0.03m of aggregate 3/15 + non-woven Gravifiltre or Draina G 10, unrolled with overlap on 3 pedestals, if S ⩽ 30m²: non-woven Gravifiltre + synthetic film 100µ.

Subdividing the hard ballast:

- Joints 20mm minimum, every 6m maximum, and at reliefs and convex features.
- Joints to be packed with rot resistant system, capable of alternating deformations.

Concrete pavers, interlocking or not

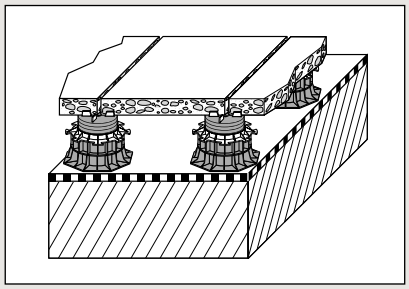


Pavers: minimal thickness 0.06m.

Isolating layer: sand bed, 0.06m minimum.

Subdivision: joints 20mm minimum at reliefs and convex features, packed with rot resistant system and capable of alternating deformations.

Protection by tiles on adjustable supports, laid directly on roof waterproofing membrane



Timber decking tiles:
Dalle Boise HR 56, Dalle Duo ceramic tiles or concrete tiles (0.40m minimum) spaced from 0.02 to 0.06m.

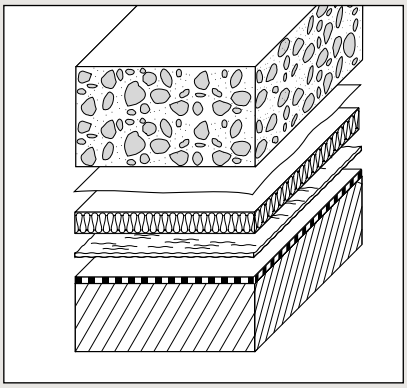
Plots Zoom:

Joints from 6 to 10mm at reliefs and convex features.

On the border of the parapets and convex features, the subdivided slabs or tiles are supported by Placadal elements overfitted on the tops of the Plot Zoom adjustable supports.

The use limits for the various types of slabs or tiles, related to the service loads, according to the standards in force, shall be verified in the professional technical documents.

Protection of rollways for façade servicing equipment



Reinforced concrete slabbing:
- Proportioned and mixed with plasticiser-water reducing agent.
- Thickness specified by the Professional Rules (minimum 120mm).

Isolating layer:
- Synthetic film 100µ.
- Expanded polystyrene panels, Class F, 0.02m thick.
- Non-woven Gravifiltre.

Subdividing the slabbing:
- Joints minimum 20mm, every 5m maximum, and at reliefs and convex features.
- Joints to be packed with rot resistance system and capable of alternating deformations.

Note: in general, these protection structures are not built by the waterproofing contracting firm.

Upstands

The instructions below apply only in plains climates.

Supports

The parapets, made of masonry, shall enable the upstand flashings to extend upward to a height h ⩾ 0.10m above the main area's heavy ballast or the surfacing, as indicated in Figures 1, 2 and 3 (opposite).

Case of planted areas

Height h above the ballast (sterile zone or loam) is a minimum of 15cm.

Preparation of the supports

- **Upstand not thermally insulated**

Sealing compound Siplast Primer.

- **Thermally insulated upstand (general case)**

Vapour barrier (in certain cases):
Paradiene 35 SR4 torched to the Siplast Primer (sealing compound).

Allowable thermal insulation boards (contingent upon their Technical Assessments):
- Torchable mineral wool or bitumen surfaced fibrous perlite, mechanically fixed.
- Bitumen surfaced cellular glass, bonded with hot bitumen.

Concrete access decks
For pedestrian

Upstands

Main area with hard ballast

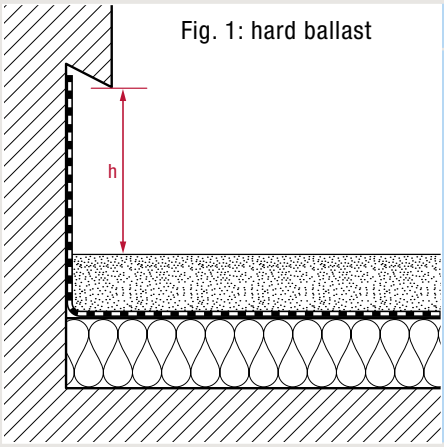


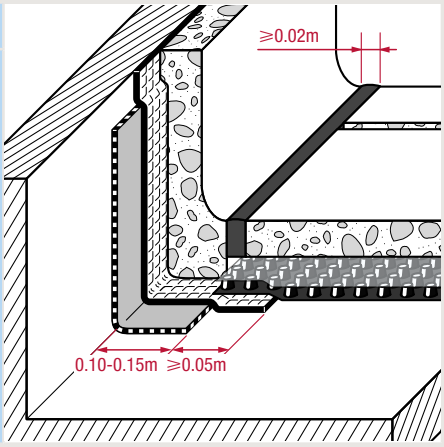
Fig. 1: hard ballast

Waterproofing

Hard ballast
(details further on)

Upstand top layer
Torched Paradial S

Upstand underlayer
Torched Paradiene 35 S R4



Main area with tiles on adjustable supports (Plot Zoom)

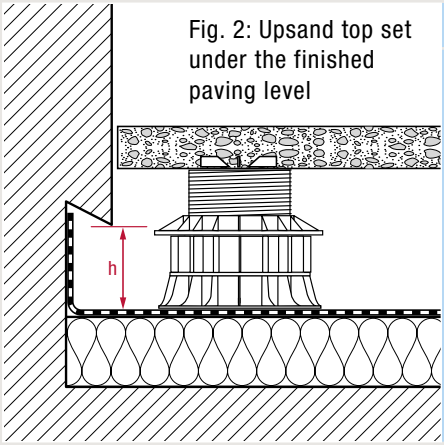
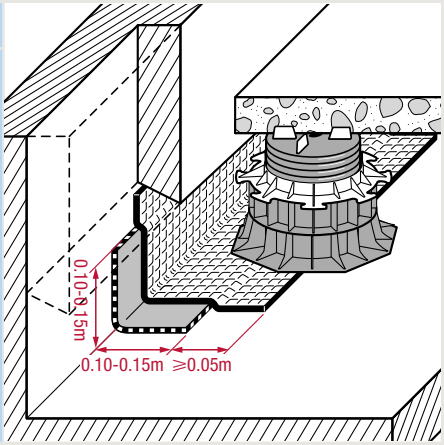


Fig. 2: Upsand top set under the finished paving level

Waterproofing

Finish layer
Paradial S, welded

Reinforcement angle torched
Parequerre, welded



Main area with tiles on adjustable supports (Plot Zoom)

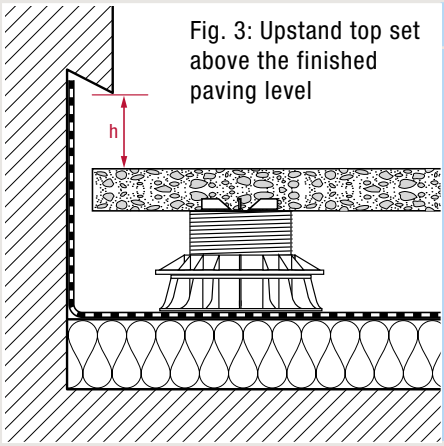


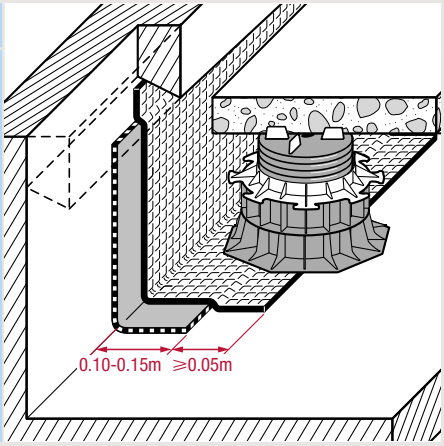
Fig. 3: Upstand top set above the finished paving level

Waterproofing

2nd layer of upstand
Verinox S, welded

Underlayer of upstand
Paradiene 35 S R4, welded

Note: as a variant, the bare Verinox S finish can be replaced by Paradial S protected by a wire netting reinforced cement screed, as described below.



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Upstands in hard ballast

When the mechanical strains risk harming the waterproofing upstand, this is necessary. However, it can be avoided whenever the membrane, continuous and dismantled within the height, prevents access to the upstand (while still enabling its maintenance).

■ **The hard ballast** consists of a wire netting reinforced cement screed, proportioned and mixed with plasticiser, water reducing agent, 0.03m thick.

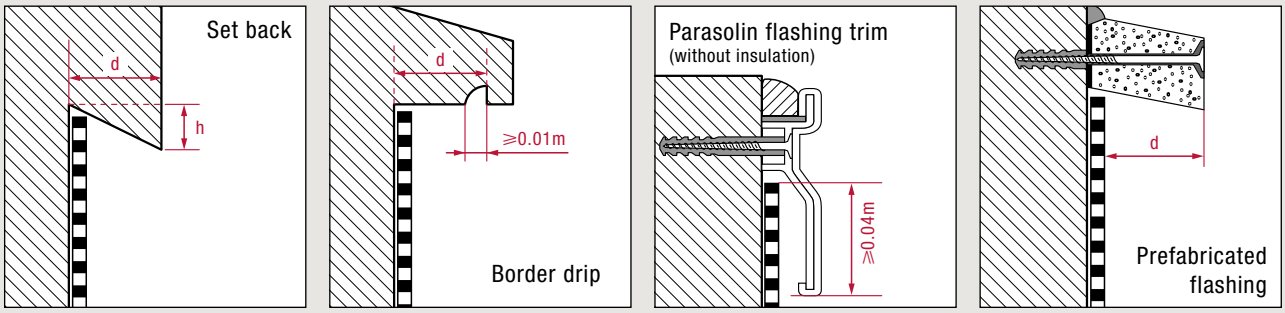
It is subdivided every 2m, with mortarless joint, and separated from the ballast in the main part by a joint 0.02m minimum, packed with a rot resistant system, capable of alternating deformations.

■ **The screed can be fixed at the top,** above the waterproofing upstand; this fixing is optional for relatively low screeds (⩽ 0.20m), containing a lower framing toe or a batter.

■ **Height ⩾ 0.40m:** the screed thickness is 0.05m and the reinforcement is of expanded metal or of welded wire mesh. Chicken wire mesh reinforcement is not to be used.

Structures at the upstand top

At their upper part, the upstands shall contain a watertight structure, preventing run-off water from penetrating in back of the waterproofing upstand. The diagrams below show several possibilities, represented without thermal insulation board and without ballast. The structure's protrusion dimensions take into account the thickness of the insulation board and of any ballast, according to the table below.



	d (mm)	h (mm)
Upstand with granule protection	40 + i	20
Upstand ⩽ 0.40m with hard protection	70 + i	30
Upstand > 0.40m with hard protection	90 + i	30

Note : i = eventual thickness of insulation board

Standard description

■ The parapets and herbs, height... are coated with Siplast Primer.

Case of insulated upstands:

- Irex Profil vapour barrier
- Thermal insulation boards … holding a Technical Assessment, fixed by …, thickness … mm, providing a thermal resistance of … m².°C/W (if necessary, see "Vapour barrier and Thermal insulation board" booklet and the Technical Assessment for the thermal insulation board).

■ The waterproofing system is composed as follows:

- An underlayer of SBS (Styrene Butadiene Styrene) torched layer…
- A 2nd layer of torched … with a framing toe 0.15m minimum.

■ The hard ballast (when present) consists of a cement screed in compliance with the professional rules in force.

■ The protection system at the top of the upstand will be …

Complementary information

■ Product data sheets:
Irex Profil, Paradial S, Paradiene, Parasolin, Parequerre, Siplast Primer, Verinox S.

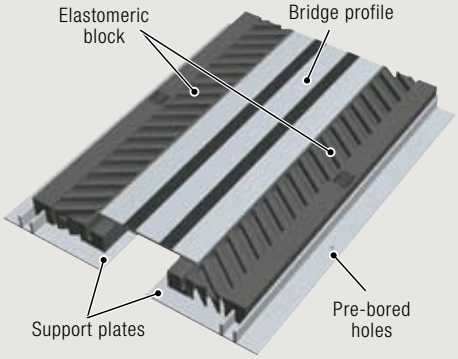
Concrete access decks
For vehicle traffic

Paradyl flat expansion joint

Strong points

- Application easy and mortarless
- Resistant to bad weather and traffic
- Details and connections simple to install

Description



■ Supporting plates of pultruded resin. Dimensions: 1,000 x 215 x 5mm. Weight per unit of length: 2.4kg/linear meter.

■ Vulcanised elastomeric blocks, differentiated deformability, fitted onto the supporting plates. Dimensions: 1,000 x 150 x 45mm. Weight per unit of length: 5.4 kg/linear meter.

■ Reinforced pultruded resin covering bridge, fitted into the elastomeric blocks. Dimension: 1,000 x 200 x 7.5mm. Weight per unit of length: 3.0 kg/linear meter.

Application

Protection on the waterproofing of flat expansion joints for parking areas and for light vehicle suitable flat roofs. Paradyl complements the Neodyl system for waterproofing carcass joints.

Performances

■ **Covering bridge**

Breaking point under transversal bending stress ⩾ 260MPa.

Module of elasticity: 14,000 MPa.

■ **Elastomeric blocks**

Stiffness constants:
horizontally < 10N/mm;
vertically > 300N/mm.

Horizontal deformability, withstanding a puffing, 20mm minimum.

Installation

Installing the Paradyl joint requires a careful preparation of the substrate that is to be flat (flattening down when necessary with resin mortar, planing, etc.). For the installation, refer to the installation manual that comes with each kit of 1m.

Reference document

ATEx: CSTB Experimental Technical Assessment no. 1288.

Safety

The Paradyl system is not classified as dangerous within the framework of the application set down in this document.

Standard description

Flat expansion joint (light vehicle traffic suitable parking areas), built in compliance with the Paradyl ATEx in association with the Neodyl system, comprising:

- Application of a Siplast Primer sealing compound.
- Torching on of an underlayer of saturated felt SBS (Styrene Butadiene Styrene)/BE 35 PY 180 Paradiene 35 SR4, one meter wide on either side of the joint, joints edge to edge at the end of the strip.
- Installation of the seal with expansion loop, a strip of saturated felt SBS/BE 50, non-reinforced, Neodyl, 66cm wide, torched on either side on the waterproofing underlayer.
- In the expansion loop, installation of the Butyle 30mm Neodyl packing cord.

The flat joint seal is protected by supporting plates of pultruded resin, supplemented by vulcanised elastomeric blocks with differentiated deformability, fitted onto the support plates plus installation of the pultruded resin covering bridge, fitted onto the elastomeric blocks.

General descriptions for car park & vehicle traffic

Allowable bearing elements

Masonry and concrete in compliance with the Technical Specifications in force and appropriately prepared (bridging of joints).

Allowable slopes in plains climate

2% ⩽ slope ⩽ 5%: flat roofs, traffic suitable for pedestrians and car park. Slope > 5%: access ramps; some slopes may reach 18%.

Classification according to intended use and traffic

■ **Roof for light vehicle car park (or roof suitable for light vehicle traffic)**

- Circulation and car park zones for limited traffic for light vehicles (load ⩽ 2t per axle), occasionally for fire fighting vehicles and trucks for removals; example: private residence zone.
- Zones for circulation and parking of major traffic for light vehicles; example: megamarkets.

■ **Heavy vehicle car park roofs (or heavy vehicle traffic suitable roofs)**

- Zones of circulation and parking for heavy vehicles (load > 2 t per axle); example: flat roofs accessible to waste collection, to heavy vehicles.

According to the intensity of the heavy vehicle traffic, such traffic can be qualified as minor or major.

Note: for loads greater than 13 t/axle, special studies will be necessary.

The car park roofs are designed for car park or for traffic at relatively low speeds, hence with moderate braking forces. In certain cases it is recommended that "slowing" devices be provided to limit the speed and any sudden braking.

Thermal insulation boards allowed

■ Expanded fibrous perlite with Technical Assessment covering this application. An appropriate design and execution study is necessary in the case of heavy vehicle parking.

■ Cellular glass (in general without vapour barrier) with Technical Assessment covering this application.

The insulation shall always be bonded with hot bitumen, full adhesion. The vapour barrier (under perlite insulation board) is made of Irex Profil (Irex Profile), welded to Siplast Primer

Note: No thermal insulation board is allowable in case of protection by poured asphalt or macadam.

Wearing course for vehicle traffic and car park

The instructions below apply only in plains climates.

Information for calculation of permanent loads

Poured asphalt (d: 2.35):	0.60kN/m² for 0.025m thick
Macadam/bituminous concrete (d: 2.3 approximately):	0.90kN/m² for 0.040m thick 1.35kN/m² for 0.060m thick
Reinforced concrete slabbing:	1.50kN/m² for 0.060m thick
Bed of aggregate 3/15:	0.60kN/m² for 0.030m thick
Bed of sand:	1.00kN/m² for 0.050m thick

Note: 1kN ≈ 100kg

Poured asphalt

The AG and AC type poured asphalts are defined in the Asphalt Office Specification booklet.

The various names correspond to the following grades:

- **AG2:** Fine gravel filled asphalt, waterproofing of vehicle parking.
- **AG4:** Fine gravel filled asphalt for ramps.
- **AC1:** Asphalt for ordinary roadway.

The nature and thickness of the poured asphalts included in the composition of the mixed coverings (2nd layer of waterproofing) and in their complementary protection as the case may be (if the ballast chosen is of asphalt) the asphalts are described in the adjoining table.

Intended use and traffic	2nd waterproofing layer on Basasphalte SI or Paraforix	Complementary traffic suitable asphalt protection	
		Basasphalte SI process	Paraforix process
Light vehicle traffic suitable flat roof: minor traffic	25mm AG2	none or 25mm AG2	25mm AG2
Light vehicle traffic suitable flat roof: major traffic	30mm AC1	none or 30mm AC1	30mm AC1
Heavy vehicle traffic suitable flat roof	25mm AG2	not covered (1)	
Ramps	25mm AG4	not covered (1)	

(1) Only concrete slabbing is considered.

Concrete access decks
For vehicle traffic

Wearing course made of various types of macadam/ bituminous concrete

These paving mixtures are defined in the NF P 98-100 French Professional Standards and, more particularly, in the following standards:

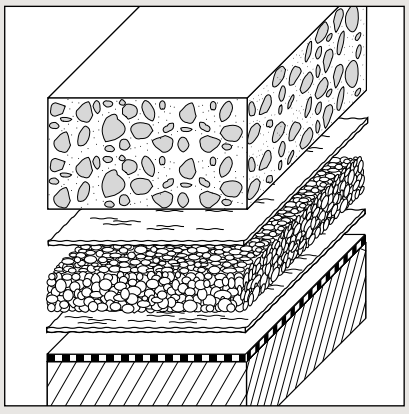
- **NF P 98-130 Hydrocarbon paving mixtures:** wearing courses and base courses: fairly coarse grained bituminous concrete (BBSG);
- **NF P 98-132 Hydrocarbon paving mixtures:** wearing courses and base courses: thin bituminous concrete (BBM);
- **NF P 98-137 Hydrocarbon paving mixtures:** wearing courses and base courses: very thin bituminous concrete (BBTM);
- **NF P 98-141 Hydrocarbon paving mixtures – wearing courses and base courses:** high modulus bituminous concrete (BBME).

The bituminous concretes of the wearing course shall comply with the standards that cover the definition of the classification, of the characteristics, of the manufacture and of the laying. The nominal thickness and nature of the hydrocarbon paving mixture layers (after compacting), laid as ballast on the waterproofing by asphalt saturated felt or as possible complementary ballast of the mixed pavings (if this ballast solution is selected) as set down in the table below.

Intended use and traffic	Ballasting on Parafor Solo/ Thermosolo bituminous waterproofing	Ballasting by hydrocarbon paving mixture, vehicle traffic suitable, complementary to the mixed systems of felt + asphalt: Paraforix system	
		Basasphalte SI process	Paraforix process
Light vehicle traffic suitable flat roof: minor traffic	BBM* 0/10 thick. 5 cm	BBSG 0/10 thick. 5 cm	BBSG 0/10 thick. 5 cm
Light vehicle traffic suitable flat roof: major traffic	BBSG* 0/10 thick. 6 cm	BBSG 0/10 thick. 5 cm	BBSG 0/10 thick. 5 cm
Heavy vehicle traffic suitable flat roof	BBSG* 0/10 ép. 7 cm (* ou BBME)	not covered (1)	
Access ramps (on Parafor Ponts)	BBSG 0/10 thick. 7 cm	not covered (1)	

(1) Only concrete slabbing is considered.
BBM 0/10 = Thin bituminous concrete 0/10
BBSG 0/10 = Semi-coarse bituminous concrete 0/10

Ballasting by reinforced concrete slabbing



Reinforced concrete slabbing, proportioned and mixed with plasticiser, water reducing agent:

- Light vehicle parking: 0.06m thick.
- Heavy vehicle parking: ⩾ 0.12m thick, defined by the “Slabbing” Rules and in compliance with the Professional Rules in force.

These ballasting structures are not built by the waterproofing contracting firm.

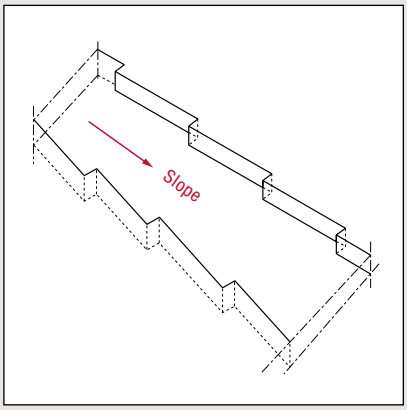
Separating and drainage layer:

- Of non-woven Gravifiltre + 0.03m of aggregate 3/15 + non-woven Gravifiltre.

Subdivision

Joints 20mm mini wide every 4 to 5m in each direction and at reliefs and convex features, joints packed with a system which is rot resistant and capable of alternating deformations.

Access ramps



Reinforced concrete slabbing

The slabbing shall pass the various stresses (vertical, tangential, …) onto the bearing structure, held against it by appropriate stop structures.

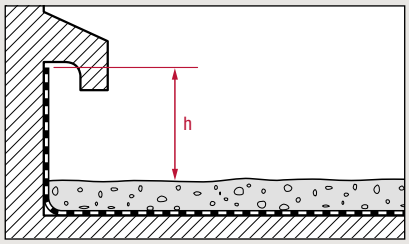
Separating layer: (parking for Light or Heavy Vehicles): non-woven Gravifiltre + synthetic rot resistant film, 100 microns.

Upstands for vehicle traffic

The instructions below are only applicable in plains climates.

Kerbs

The kerbs, built of masonry, shall make it possible for the upstand flashing to extend to a height h ⩾ 0.10m above the ballast of the main part.



Upstand flashing

Upstand with hard ballast

Preparation of the support

Upstand not thermally insulated

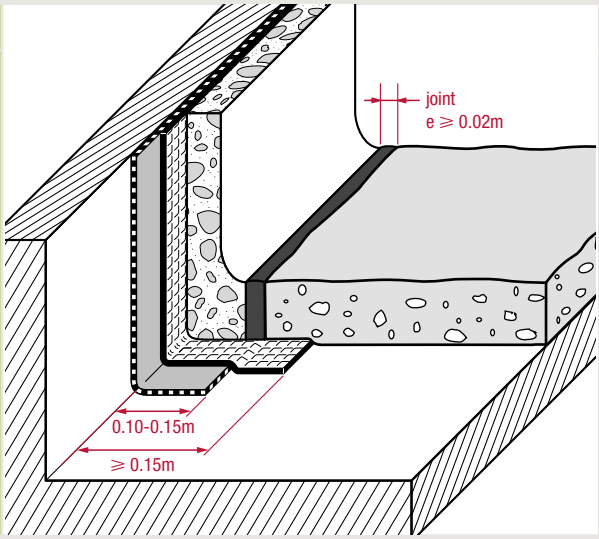
Siplast Primer

Upstand thermally insulated

Vapour control layer (optional): Irex Profil torched to Siplast Primer

Allowable insulations (contingent upon their Technical Assessments):

- Weldable mineral wool or bitumen surfaced fibrous perlite, fixed mechanically
- Cellular glass, bitumen surfaced, bonded with hot bitumen



Waterproofing

Protection with hard ballast, welded:

Paradial S (aluminium surface)

Torched reinforcement angle:

Paradiene 35SR4

Self-protected upstands

Preparation of the support

Upstand not thermally insulated

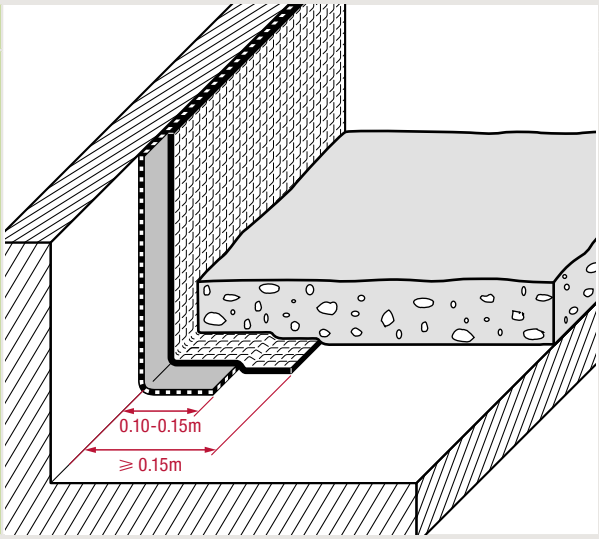
Siplast Primer

Upstand thermally insulated

Vapour control layer (optional): Irex Profil torched to Siplast Primer

Allowable insulations (contingent upon their Technical Assessments):

- Weldable mineral wool or bitumen surfaced fibrous perlite, fixed mechanically
- Cellular glass, bitumen surfaced, bonded with hot bitumen



Waterproofing

Top layer, welded:

Verinox S (stainless steel surfaced)

Torched reinforcement angle:

Paradiene 35SR4

Concrete access decks
For vehicle traffic

Upstands in ballast

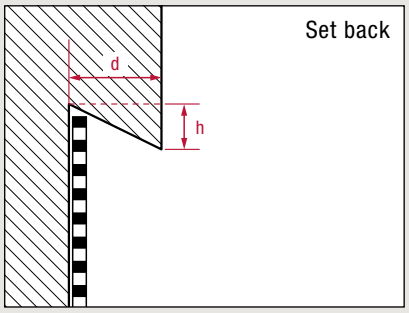
When the mechanical strains are likely damage the upstand flashing, this ballast is necessary. It may however be avoided when a continuous membrane, removable within the height, prevents access to the upstand (but allowing its maintenance).

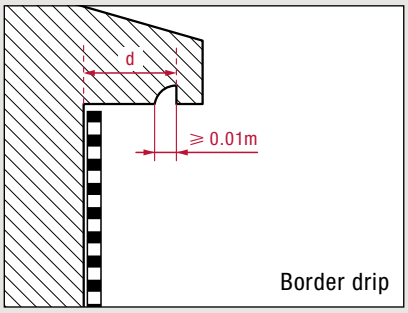
The hard ballast consists of a screed of wire netting reinforced cement, proportioned and mixed with plasticiser, water reducing agent, 0.03m thick. It is subdivided every 2m, with mortarless joint, and separated from the ballast of the main part by a joint 0.02m wide minimum, packed with a rot resistant system, capable of alternating deformations.

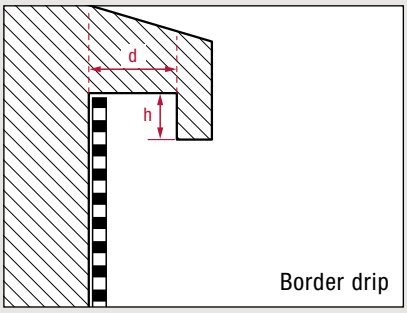
- The screed shall be fixed at the top, above the upstand flashing; this fixing is optional for relatively low screeds (⩽ 0.2m), containing a framing toe or a batter.
- Height ⩾ 0.40m: the screed thickness is 0.05 m and the reinforcement is of expanded metal or of welded wire mesh. Chicken wire type reinforcement is not to be used.

Structures at the top of the upstand

The reliefs shall include, at their upper part, a waterproof structure, preventing run-off water from entering in back of the waterproofing upstand. The diagrams below indicate several possibilities, shown with thermal insulation board and without ballast. The dimensions of the protrusion of the structure take into account the thickness of the insulation board and of any ballast, according to the table below.







	d (mm)	h (mm)
Upstand with granule protection	40 + i	20
Upstand ⩽ 0.40m with hard protection	70 + i	30
Upstand > 0.40m with hard protection	90 + i	30

Note : i = eventual thickness of insulation board

Standard description

- The parapets and kerbs, height … are coated with Siplast Primer.

Case of insulated upstands:

- Irex Profil vapour barrier.
- Thermal insulation boards … holding a Technical Assessment, fixed by …, thickness … mm, providing a thermal resistance of … m².°C/W (if necessary, see “Vapour barrier and Thermal insulation board” booklet and the Technical Assessment for the thermal insulation board).
- The waterproofing is composed as follows:
- An underlayer of SBS (Styrene Butadiene Styrene) Paradiene 35 S R4 impregnated felt, torched.
- A 2nd layer of torched … with a framing toe 015m minimum.
- The hard ballast (when present) consists of a cement screed in compliance with the professional rules in force.
- The protection system at the top of the upstand will be …

Complementary information

- Product data sheets:
Irex Profil, Paradial S, Paradiene, Siplast Primer, Verinox S.

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Concrete access decks
For pedestrian & vehicle traffic

Siplast product descriptions

Asfix 320: hot-applied elastomeric bituminous mastic used for joint sealing

Biecran: composite separating layer with a 100g/m² glass fleece and a 70g/m² kraft paper sheet.

Colle Par: bituminous cold adhesive.

Dalle Boise HR 56 : timber decking tile manufactured from fungicidal treated and renewable maritime pine. They are composed of anti-slip groove surfaced slats which are fixed with stainless steel screws to 3 supports..

Draina G10: drainage and separating layer to apply under heavy ballast made of concrete screed, prefabricated slabs of concrete or hard stone.

Gravidrain: expanded polystyrene drainage panels for roof gardens.

Gravifiltre: polyester filter layer for roof gardens.

Graviflex: polyester-reinforced, SBS-modified, granule-surfaced, elastomeric bitumen cap sheet with root-repellent additive for roof garden waterproofing. Surfaced with slate flakes, thermofusible film on the underside.

Irex Profil: elastomeric bitumen, glass fibre reinforced vapour control layer.

Paradial S: plain aluminium-faced, glass-reinforced elastomeric bitumen cap sheet, fusible film on the underside, nominal 70mm selvedge.

Paradiene JSR4: SBS elastomeric bitumen membrane with self-adhesive side laps as underlayer of a loose-laid two ply system under heavy protection.

Paradiene S R3: glass/polyester composite-reinforced, torch-applied SBS-modified elastomeric bitumen underlayer, film-faced with perforated thermofusible film on the underside.

Paradiene S R4: polyester-reinforced, torch-applied SBS-modified elastomeric bitumen underlayer, film-faced with perforated thermofusible film on the underside.

Paradiene S VV: glass-reinforced, torch-applied SBS-modified elastomeric bitumen underlayer, fusible film on the upper surface, sanded or film-faced on the underside.

Paradiene 35 S R4 : polyester-reinforced, torch-applied SBS-modified elastomeric bitumen top-layer, 3,5 mm thick, fusible film on the upper surface, sanded or film-faced on the underside.

Parafor Ponts : polyester-reinforced, torch-applied SBS-modified elastomeric bitumen top-layer, 4 mm thick, surfaced with granules and fitted with perforated thermofusible film on the underside.

Parafor Solo GS : polyester-reinforced, torch-applied SBS-modified elastomeric bitumen capsheet, 4 mm thick, designed for single-layer systems. Surfaced with coloured granules benefiting of a large colour range. Grooved underside (patented system) surfaced with thermofusible film.

Paraforix: polyester-reinforced, SBS-modified, elastomeric bitumen waterproofing membrane for roof car parks, sanded on the upper surface, thermofusible film on the underside.

Parequerre: Polyester-reinforced SBS-modified elastomeric bitumen underlayer. Cut in 0,25m wide strip for use as reinforcement angle on upstands.

Perfader : partial bonding oxidised bitumen underlay for torch-applied waterproofing systems, secured by a 15% ratio of perforations.

Plot Zoom : screw-adjustable support for paving slabs on pedestrian areas. Fully adjustable by the means of a threaded upper supporting head overcoming the differences of height and falls in the roof deck . Range of 3 varying bases and additional extension collars provide variable paving heights from 40 mm to 225 mm. (note : a cushioning pad positioned on top of the supporting head improves stability and reduces noise).

Preflex: polyester reinforced, elastomeric underlayer for roof garden waterproofing, thermofusible film on both sides.

Siplast Primer: cold-applied, quick drying, universal elastomeric bitumen primer. Approx. coverage from 0.10 litre/m² on steel to 0.40 litre/m² on concrete.

Teranap JS: SBS elastomeric bitumen, 2m wide membrane of 4mm nominal thickness, fitted with a self adhesive overlap protected by siliconised release paper, secured by covering strip (**Bande Couvre Joint**) torched onto the side-lap.

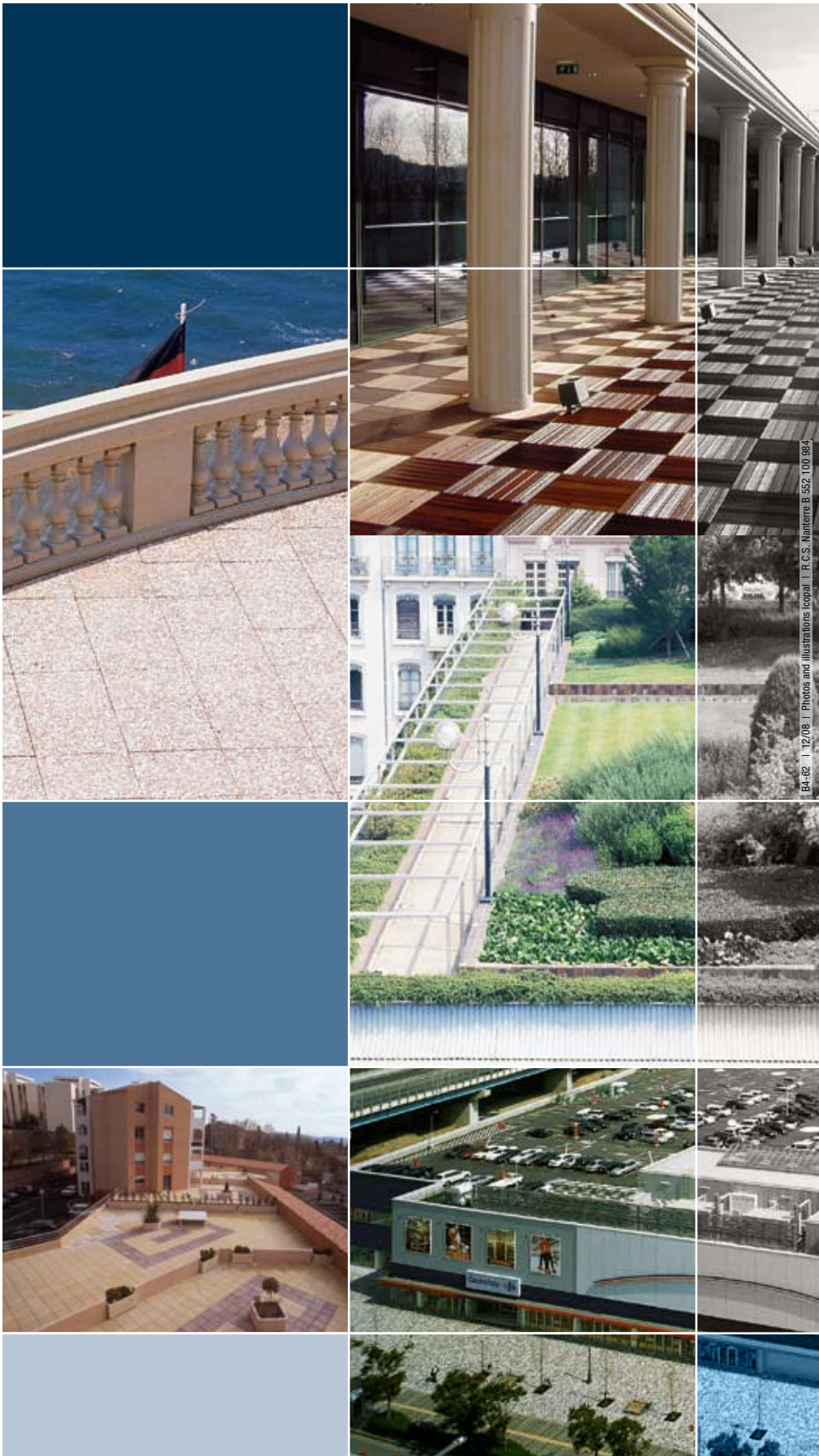
Thermosolo GS: SBS-modified elastomeric bitumen, polyester-reinforced, capsheet, 4 mm thick, with heat-activated adhesive stripes for partial bonding, designed for single-layer systems. Surfaced with coloured granules benefiting of a large colour range. Underside fitted with a distinctive pattern (patented system) of heat-activated adhesive stripes and Syntan coating in-between forming channels through which water vapour is evenly distributing .

Verecran 100: Glass fleece separating layer free-laid.

Verinox S: stainless steel-faced, composite-reinforced elastomeric bitumen cap sheet, fusible film on the underside.

Siplast

System Brochure 3 – Edition 1



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