

MANUAL SECTION
Waterproofing

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Bituthene 3000 Elastomeric Sheet Tanking and Waterproofing Membrane

Description Bituthene 3000 is a DPM (damp proof membrane) consisting of a modified bitumen sheet comprising of modified bitumen on a cross laminated polyethylene backing which is a continuous reinforcement.

Application areas:

- DPM or below grade tanking (walls buried below ground). Bituthene 3000 prevents water from entering the wall or building structure from the ground.
- Under floor slabs
- On masonry, precast or poured in-situ concrete

Features

- Compliant product with E2/AS1 July 2005; section 12.0, 12.2.2.b
- Used in New Zealand for over 35 years
- Compliant with BRANZ bulletin #397, Waterproofing basements; section 5.2.2
- 50 Year durability compliant; "Life of the building"(refer BBA approval).
- BBA approval (British Board of Agreement) #97/3325; March 2000
- All joints sealed by permanent self adhesive.
- Protected by sheet materials before backfilling
- 1.5mm thick
- Water vapour resistance 891 MNs/g BS3177
- Permeance: less than 2 ng/m².s.Pa. ASTM E96[12]

Materials

Bituthene 3000 roll 1 x 20m.
Membrane wall primer 20Lt pail applied at 5m² / Lt.
Bituthene B2 primer for priming on wet walls.
Bituthene mastic for detail work.
Bituthene liquid membrane (part polyurethane for sealing around penetrations.

Producer Statement

Bituthene 3000 complies with the requirements of the NZ building code and any relating acts. Bituthene 3000 complies with E2/AS1 and durability under B2. The conditions under B2 (50years durability for elements that are inaccessible) are accepted and complied with providing all preparation and installation is carried out by Nuplex licenced contractors and all product installation details are followed.

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Fax 0-7-847 3766	Fax 0-6-353 3632	Fax 0-4-477 7039	Fax 0-3-379 0279

BITUTHENE 3000 - SELF ADHESIVE SHEET BELOW GRADE TANKING

- Prime dry surfaces with minimum 1 coat of Nuplex Membrane Primer. Prime wet surfaces using Bituthene B2 primer. Maximum spread rate of the primer 6m²/litre.
- Install 300mm wide Bitustrip 3000 fillets where required.
- Install Bituthene mastic fillets to all internal corners.
- Install Bituthene 3000 membrane to all areas required to achieve a waterproof finish in accordance with the Grace technical data "Bituthene 3000 Foundation Protection".
- Bituthene is to be continuous with minimum 50mm side and end laps. Overlaps must be firmly rolled to ensure complete adhesion.
- Seal top edge and all end laps using Bituthene Mastic or LM 3000.
- Seal all penetrations using Bituthene membrane and LM 3000.
- Install suitable protection board or Hydroduct, Tenax 600 or other approved protection/drainage sheet prior to backfilling.
- Back fill as required.
- Protect exposed Bituthene 3000 from UV using Bituthene Solarshield, Soprema Soprasolin or other suitable protection.

Note the following:

Must be installed by Licensed Nuplex Contractors who are members of The Nuplex Contractors Federation Inc.

Install minimum 100 mm dia drain with openings to collect water at the base of the wall.

Drain is to be placed 200mm below the interior basement floor level.

Drain must have minimum 1:200 fall to the outlet.

Outlet must have access for cleaning the drain.

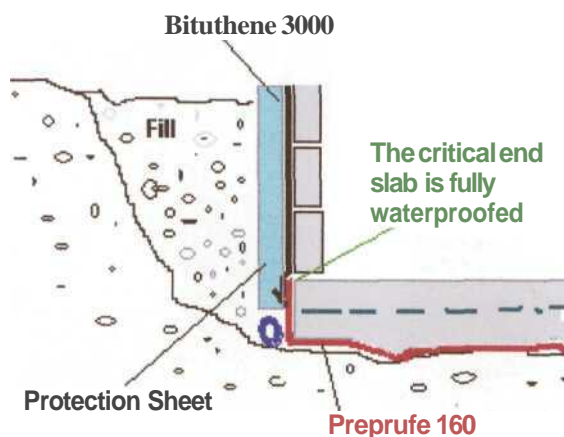
Top of the Bituthene is to extend a minimum 150mm above ground level and finish into a sawn chase.

Base of Bituthene must extend a minimum of 200mm below interior basement floor level and seal with floor DPM.

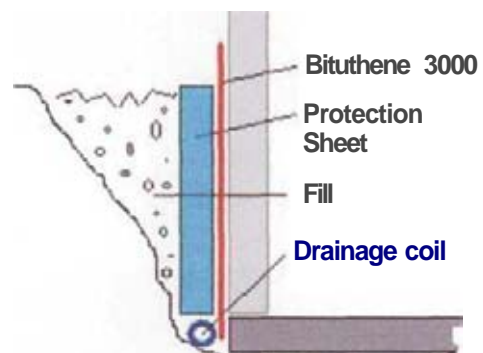
Check Bituthene Membrane for faults or damage prior to installation of protection board or drainage sheet.

Ensure finished ground surface falls away from the membrane a minimum 1:30 to divert ground water.

Connecting Slab & Wall Waterproofing



Bituthene3000 Waterproofing an external wall

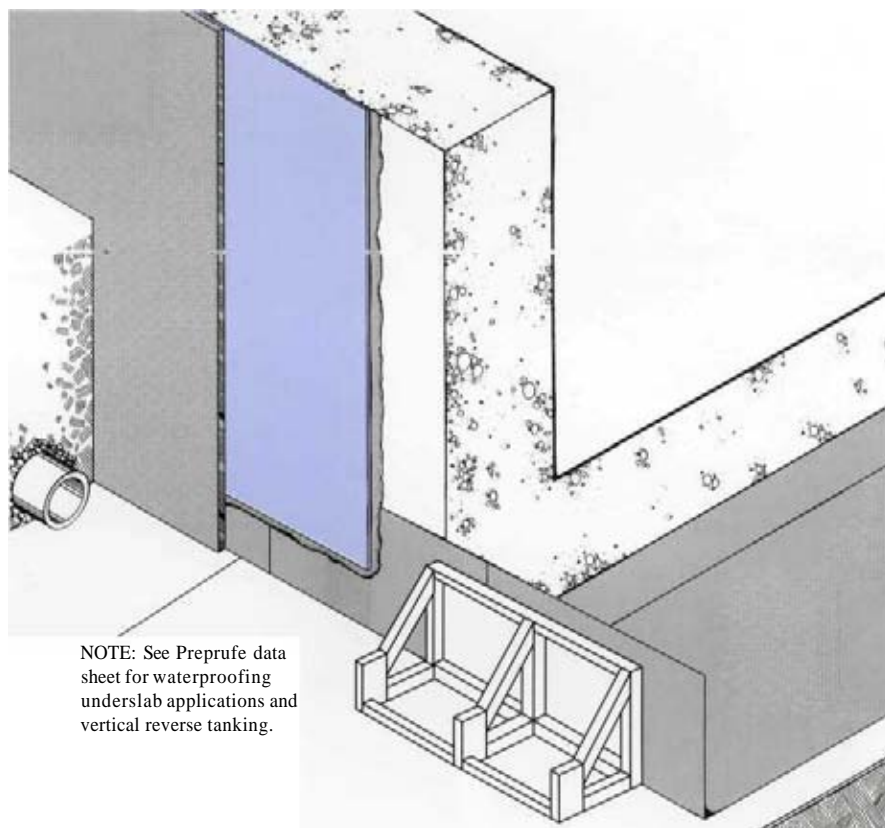


Bituthene® 3000

High performance, preformed self-adhesive rubber/bitumen polyethylene waterproof laminate tanking membrane system for basements and sub-structures.

Features

- Waterproof - capable of resisting a hydrostatic head when fully supported.
- Cross laminated - provides dimensional stability, high tear strength, puncture and impact resistance.
- Single layer - simple, reliable, low labour cost with benefit of site programmed installation.
- Cold applied - no heating, self-adhesive overlaps ensure continuity.
- Chemically resistant - provides effective external protection against aggressive soils and ground water.
- Flexible - accommodates minor settlement and shrinkage movement.
- Controlled thickness - factory-made sheet ensures constant, non-variable site application.
- Tanking security - combined flexible membrane and waterstop system for security.



Applications

Bituthene 3000 is an advanced, cold applied, flexible preformed waterproof membrane combining a special high performance cross laminated, HDPE carrier film with a self-adhesive rubber bitumen compound. The advanced carrier film is manufactured by cross laminating and chemically bonding the layers together, to produce a film with greatly improved physical characteristics compared with traditional low density polyethylene films. Tear strength, puncture resistance and impact resistance are all increased to give a better factor of safety against accidental damage. When used in conjunction with Bituthene Preprufe membranes in reverse tanking applications and Serviced waterstops, cast into the concrete shell, it will provide a

continuous waterproofing/tanking system for basements and sub-structures.

It is supplied to sites in rolls 1.5mm thick, 1m wide and 20m long (20sq metres) and is unrolled sticky side down on to concrete blinding, concrete slabs or bonded on to primed vertical concrete faces. Continuity is achieved by overlapping 65mm and firmly rolling the joint. A guideline is printed on the membrane.

Applied vertically to walls and underground roof slabs, Bituthene 3000 will provide a continuous moisture/waterproof barrier.

Being factory made, thickness of membrane is constant throughout and is not subjected to variations by site

labour such as occur with brush applied materials. Bituthene 3000 is extremely flexible and well capable of bridging shrinkage cracks in the concrete and will accommodate minor differential movement throughout the service life of the structure.

Installation

Underground roof slabs shall be surface dry, free from standing water, and laid to falls free from sharp protrusions and hollows.

Horizontal, sloping or vertical faces shall be smooth, regular, dry and free from nails and primed with one coat of Bituthene Primer applied by brush or roller, at a rate of 6-8 sq metre per litre depending on the porosity of the surface, and allowed to dry completely before the application of the Bituthene.

Brickwork shall be flush pointed or rendered to provide a smooth surface before priming.

Where Bituthene is to be left temporarily exposed on vertical surfaces, batten fixing may be necessary to prevent slippage. Prior to backfilling remove battening and cover fully with a subsequent layer of Bituthene.

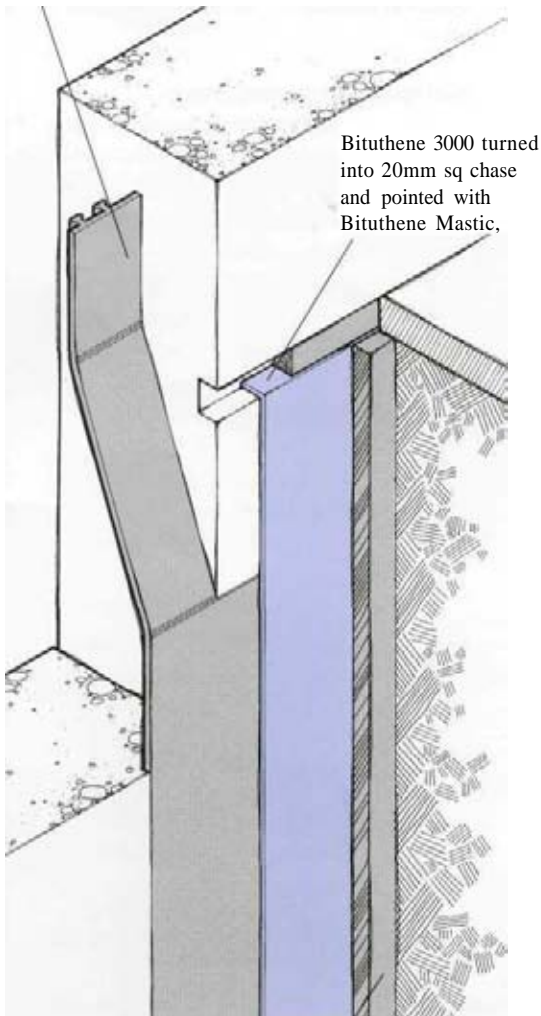
Bituthene 3000 shall be laid by peeling back the protective release paper and applying the adhesive face onto the prepared surface. The material should be brushed onto the surface to ensure good initial bond and exclude air.

Adjacent rolls are aligned and overlapped 65mm minimum at side and ends and well rolled with a firm pressure using a Bituthene Lap Roller to ensure complete adhesion and continuity between the layers. Damaged areas to be repaired by patching with an oversize patch applied to a clean dry surface and firmly rolled.

Following the application, care should be taken to prevent damage by following trades by using Servipak boards spot bonded with Pak Adhesive or a 25mm screed as horizontal protection. Vertical faces to be protected against damage from backfilling and reinforcement by using Servipak or Korkpak spot bonded with Pak adhesive.

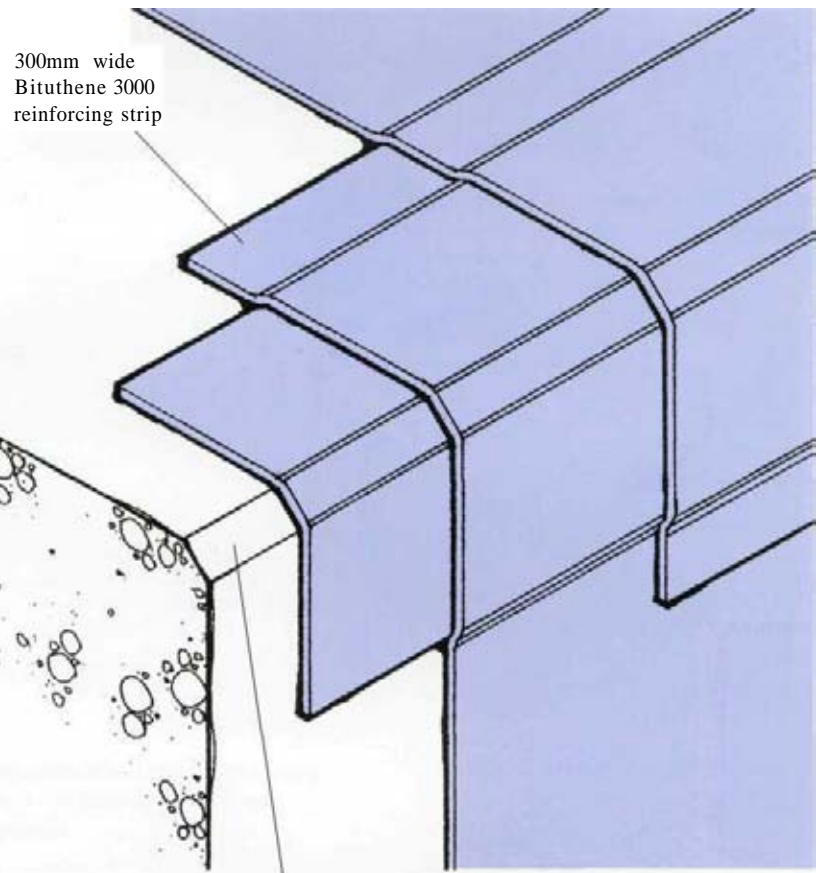
Backfill material should be compacted in layers to prevent settlement and dragging forces being transferred to the waterproofing systems.

Serviseal waterstops turned into wall and terminated 150mm above finish ground level



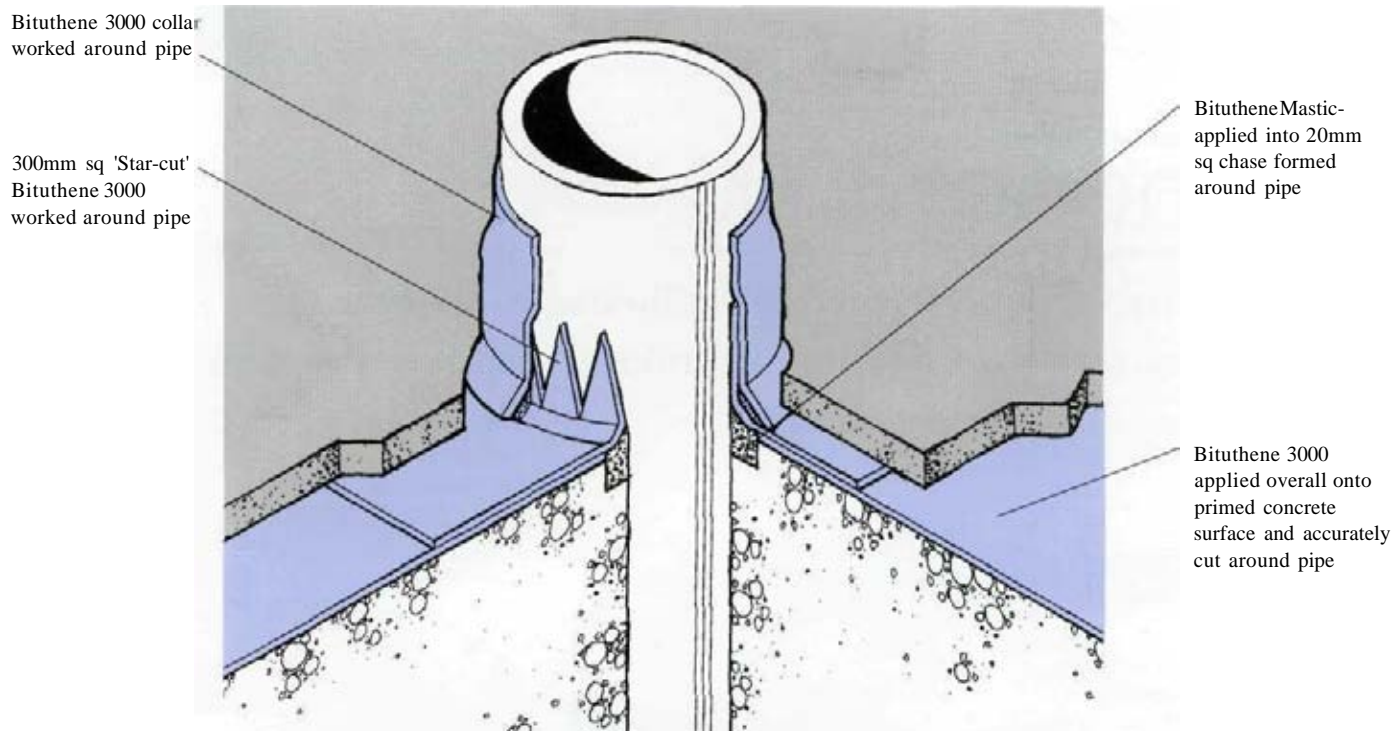
Servipak protection as required, spot bonded into position using Pak Adhesive.

Termination of membrane at top of wall



External corners to have 25mm chamfer formed concrete to assist in dressing of Bituthene 3000

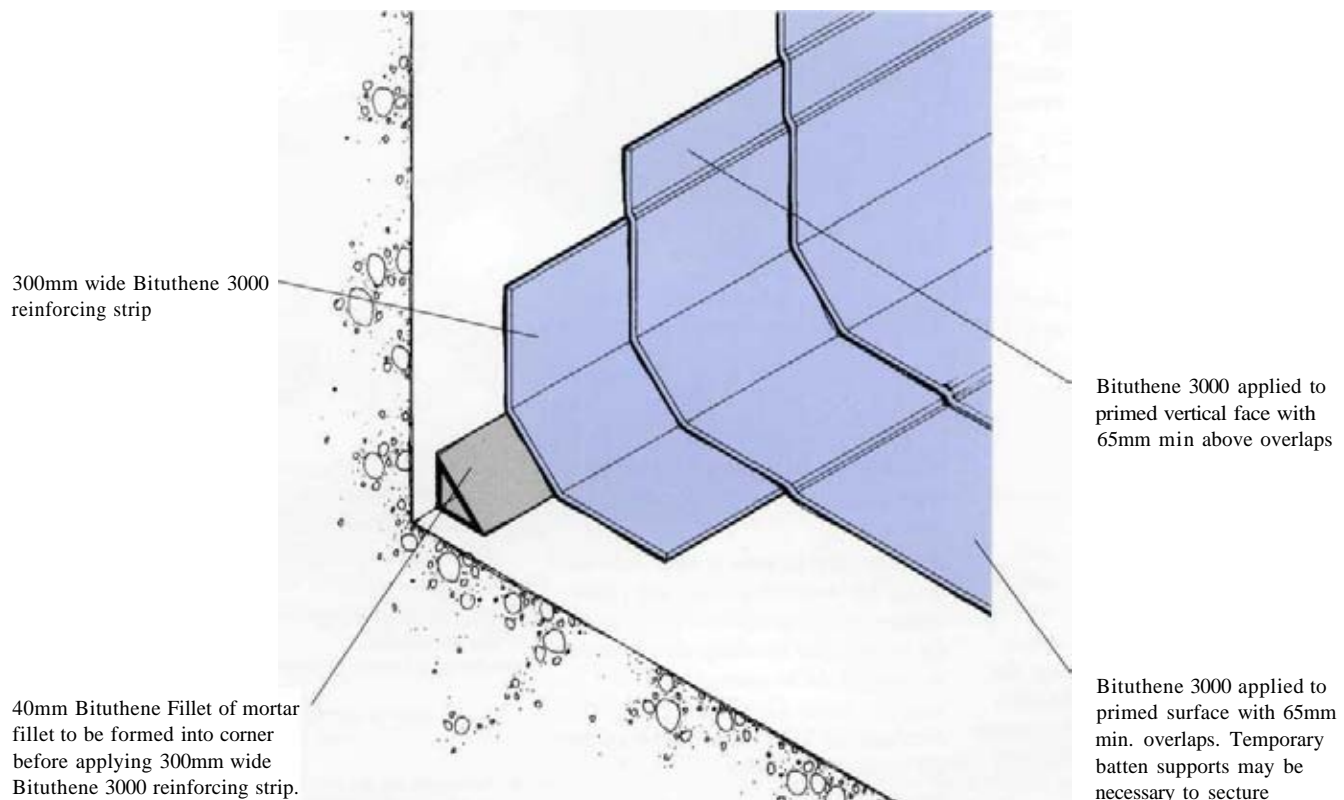
Junction between wall and underground roof slabs



Pipe through Slabs

A similar detail to this can also be used for pipes through walls

For alternative Bituthene Liquid Membrane (LM) detail, see separate LM data sheet.



Internal Corner

Reverse tanking detail adopted when access from the outside is not possible or permanent block or concrete formwork used. Concrete or blockwork wall to be smooth and flat before priming with Bituthene Primer.

Performance

Bituthene 3000 - typical performance properties

Property	Typical Values	Test Method
Colour	Dark Grey/Black	N/A
Tensile Strength (film only)	40,000 kN/nr	ASTM D882
Tape Strength	5.10 N/mm	ASTM D412 (B5300 - D882)
Elongation of membrane (to ultimate failure of rubberised asphalt)	300%	ASTM D412
Lap adhesion @ 23°C	683 N/mm	ASTM D1876
Cycling over crack @ -32°C	no effect 100 cycles	ASTM C836-89a
Puncture resistance	250 N	ASTM E154-88
Resistance to Hydrostatic head	60 m	ASTM D5385
Impact resistance	12 kg - cm	ASTM G14
Tear resistance	32 N/mm	ASTM D624
Permeance	2 ng/m ² .s.Pa	ASTM E96 [12]

Supply

Bituthene 3000	1m x 20m roll (20 sq m) weight 32 kg gross	Complementary Materials
Storage	Store upright in dry conditions below 30°C	Servipak protection boards Pak Adhesive Serviseal, PVC Edgetie, and Servitite waterstops
Ancillary Products		See separate data sheet for details
Bituthene Primer	18.2 litre pails	See separate data sheets for details
Coverage	6-8 sq metre per litre depending on method of application, surface texture, porosity and ambient temperature	40mm Bituthene Fillet Bituthene Preprufe 160 and 300
Bituthene	15.1 litre pails and	Equipment by Others
Liquid Membrane	5.7 litre pails	Soft broom, Stanley knife, brush or roller for priming.
Bituthene B2 Primer (Damp Surface)	25 litre pails 8-10 m ² /litre coverage	
Bituthene Mastic	850cc cartridges, 3 litre pails	
Bituthene Lap Roller	Unit	

Health and Safety

Refer to relevant Material Health and Safety data sheets.

Quality Assurance

W. R. Grace (Singapore) Pte Ltd is certified to ISO 9002 Quality Systems by SISIR (Singapore Institute of Standard & Industrial Research) for the manufacture of Bituthene Waterproofing Membranes under the registered certification number ISO 93-2-0269.

Specification

Bituthene 3000 preformed membrane shall be laid onto smooth primed concrete slabs and vertical concrete walls by applying the preformed membrane, sticky side downwards to give well rolled 65mm overlaps, laid strictly in accordance with manufacturer's instructions and supplied by Grace Construction Products. For further information, contact your local Grace representative.

Guarantee

Bituthene products are warranted to be free of defects in manufacture for a period of ten years.

Flat Deck Waterproofing

Bituthene 3000 is suitable for use as a primary waterproofing membrane on podiums, roof gardens and protected roof structure. Refer to Flat Deck Protection section.



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Bituthene® 3000

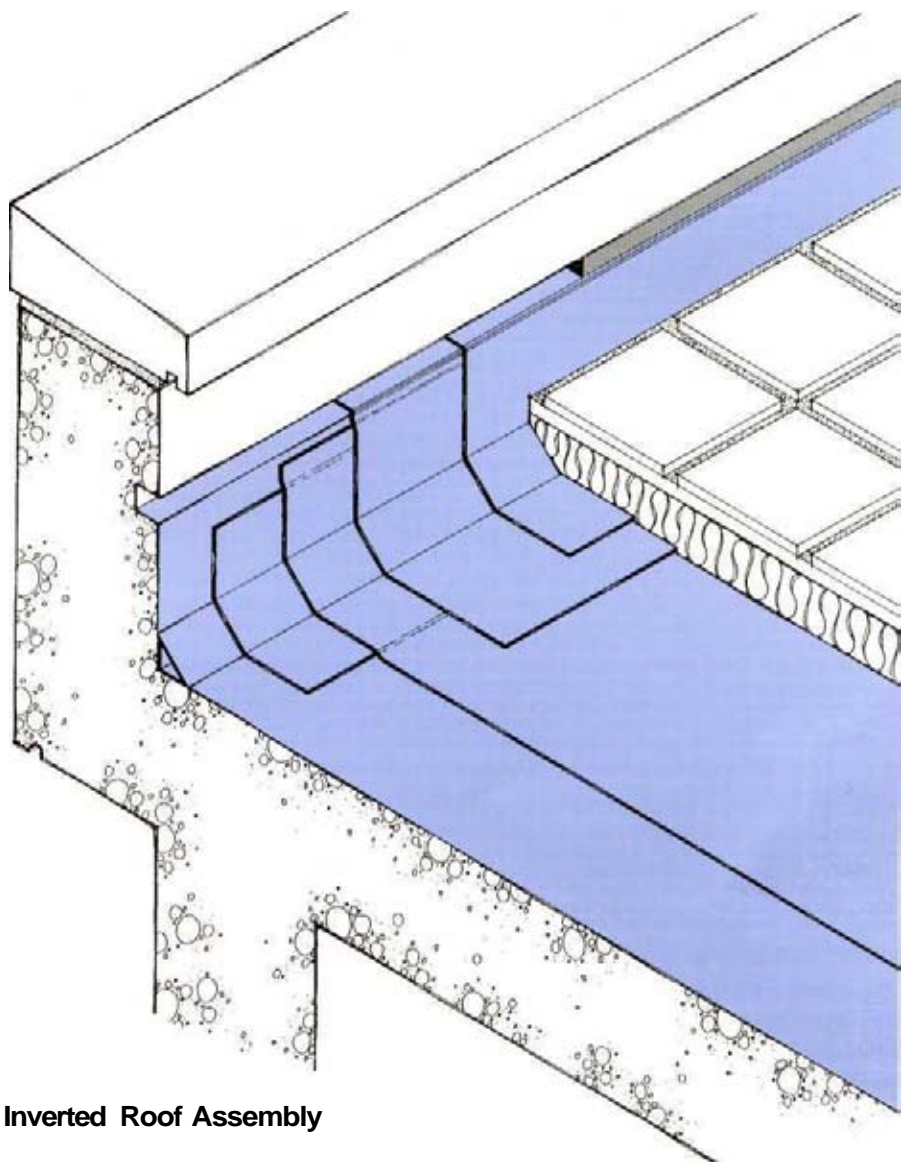
High performance, preformed self-adhesive rubber/bitumen polyethylene laminate flat deck waterproofing membrane.

Features

- Cross laminated - provides dimensional stability, high tear strength, puncture and impact resistance.
- Single layer - simple, reliable, low labour cost for flat deck application.
- Cold applied - no heating plant required, eliminates fire hazard.
- Self-adhesive - continuity ensured at overlaps, rubber/bitumen formulation allows healing of small punctures.
- Factory controlled thickness - no variation by site practices.
- Chemically resistant - provides effective external protection against aggressive environments and ozone attack.

Applications

Bituthene 3000 is a high performance cold applied, flexible preformed waterproof membrane for use on flat decks such as inverted roof assemblies, elevated or grade level podiums or plaza decks and roof gardens and terraces. It consists of a high performance cross laminated HDPE carrier film laminated to a self-adhesive rubber bitumen compound.



Inverted Roof Assembly

Supplied by:



Free Phone:

0508 88 22 88

Free Fax:

0508 55 33 44

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Performance

Bituthene 3000 - typical performance properties

Property	Typical Values	Test Method
Colour	Dark Grey/Black	N/A
Tensile Strength (film only)	40,000 kN/m ²	ASTM D882
Tape Strength	5.10 N/mm	ASTM D412
Elongation of membrane (to ultimate failure of rubberised asphalt)	300%	ASTM D412
Lap adhesion @ 23°C	683 N/m	ASTM D1876
Cycling over crack @ -32°C	no effect 100 cycles	ASTM C836-89a
Puncture resistance	250 N	ASTM E154-88
Resistance to Hydrostatic head	60 m	ASTM D5385
Impact resistance	12 kg-cm	ASTM G14
Tear resistance	32 N/mm	ASTM D624
Permeance	2 ng/m ² .s.Pa	ASTM E96 [12]

Typical Test Values may represent average values from samples tested. Test Methods noted may be modified.

Installation

Measures should be taken to ensure that all surfaces are free from ice, frost or condensation. Roof slabs must be surface dry, free from sharp protrusions and any hollows filled with high strength mortar. Installation is recommended at a temperature between +4°C and +55°C.

Horizontal and vertical faces must be smooth, regular, dry and free from nails. Horizontal and vertical surfaces shall be primed with one coat of Primer B1 or Primer B2 applied by brush or roller at a rate of 6-8 (8-10) sq m per litre depending on the porosity of the surface, and allowed to dry completely before the application of the Bituthene 3000.

Bituthene 3000 should be laid by peeling back the protective silicone release paper and applying the self-adhesive face on to the surface to ensure good initial bond. Adjacent rolls are aligned and overlapped 50mm minimum at side and ends, and the overlaps well rolled with a firm pressure using a Bituthene Lap Roller to ensure complete adhesion and continuity between the layers. Following the application and inspection care should be taken to prevent damage by following trades. As soon as practicable after the application, Bituthene 3000 should be protected from exposure to the weather and physical damage using Servipak protection boards, insulation or Hydroduct drainage composites laid dry. Any punctures or damaged areas should be cleaned and patched using Bituthene 3000 with minimum 50mm laps all round.

Exposed vertical flashings should be protected against damage from UV degradation using Solarshield. Both Bituthene 3000 and Solarshield to be terminated into a tuck or chase and sealed with Bituthene Mastic or LM to prevent infiltration of moisture behind the membrane. The junction between the slab and parapet shall have Bituthene Fillet placed firmly into position before using 300mm wide reinforcing corner strips of Bituthene 3000 placed centrally over the axis of the change of direction.

During installation of insulation and before final UV protection is applied, plain insulation boards must be protected from excessive solar heat gain from reflective flashings such as Solarshield or similar at parapets and upstands.

Supply

Bituthene 3000 1m x 20m roll
(20 sq m)
Weight 32 kg gross

Storage Store upright in dry conditions below +30°C

Ancillary Materials

Primer B1 18.2 litre pails
Coverage 6-8 sq metre per litre depending on method of application, surface texture, porosity and ambient temperature

Primer B2 25 litre pail
(damp surface) 8-10m²/l coverage
Bituthene Mastic 850cc cartridges,
3 litre can

Bituthene Lap Roller Unit
40mm Bituthene Fillet Carton 25 -
1m lengths
Bituthene 5.1 litre pails
Liquid Membrane

Solarshield See separate data sheet for details

Servipak, See separate data sheets for details
protection boards

Equipment by Others

Soft broom, Stanley knife, brush or roller for priming.

Health and Safety

Refer to relevant Material Health and Safety data sheets.

Quality Assurance

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Guarantee

Bituthene products are warranted to be free of defects in manufacture for a period of ten years.



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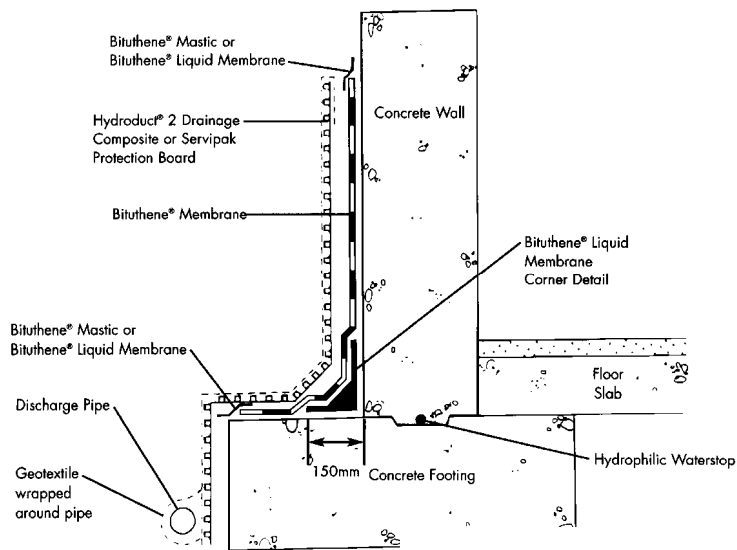
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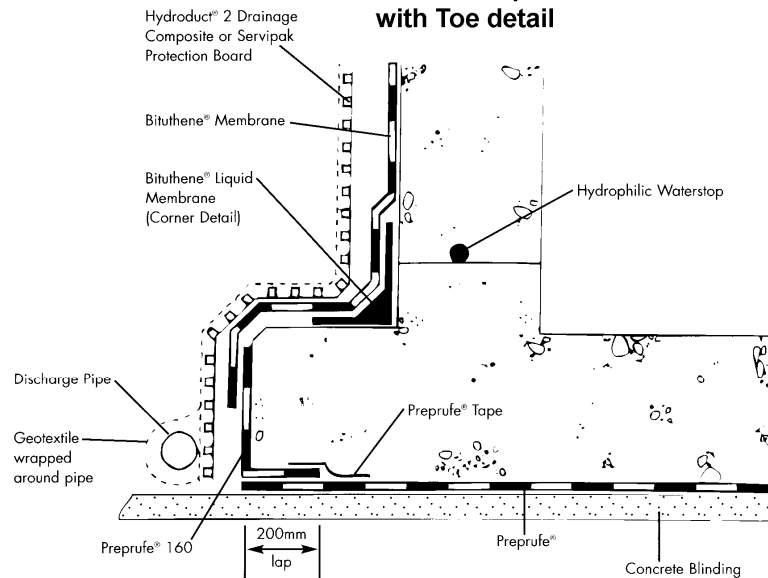
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Bituthene Details

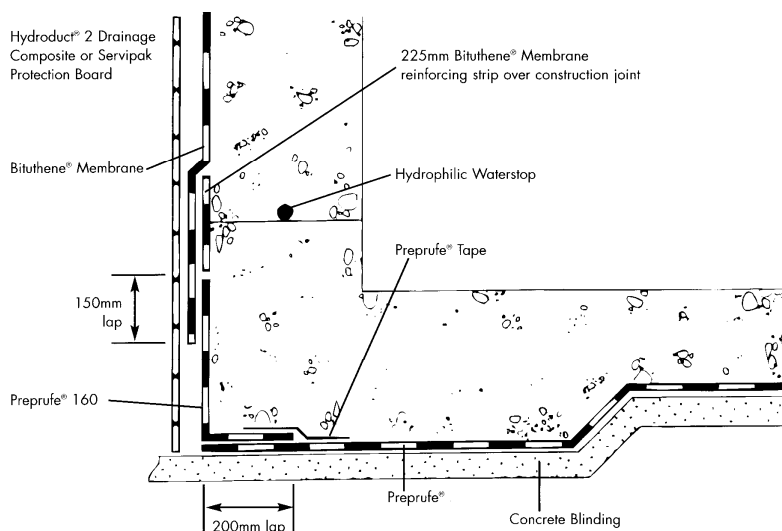
Foundation Wall - standard detail



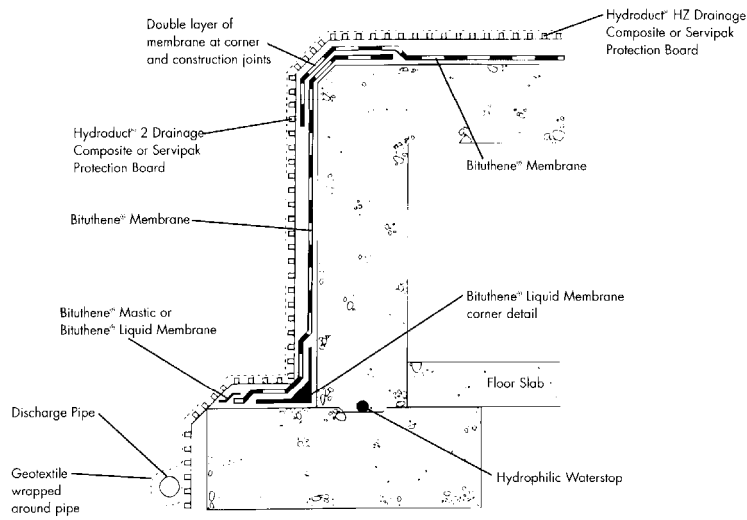
Bituthene open cut Wall base with Toe detail



Bituthene open cut Wall Base Detail



Tunnel cover or earth sheltered structure



Plaza deck - tie-in of waterproofing

