

Denso®

**LEADERS IN CORROSION PREVENTION
AND SEALING TECHNOLOGY**

The Watertight System that protects the parts you cannot see



DENSO SA (PTY) LTD

A MEMBER OF WINN & COALES INTERNATIONAL



Company Profile

Winn & Coales (Denso) Ltd have established an international reputation for the reliability of their corrosion prevention and sealing systems together with their waterproof membranes for above and below ground protection of structures.

The company was established in the United Kingdom in 1883 and has been at the forefront of corrosion prevention, waterproofing and sealing technology for over 125 years.

With eight subsidiary companies worldwide, Winn & Coales (Denso) Ltd is able to draw upon a wealth of experience in producing products to deal with corrosion and sealing problems in many types of environment.

The acquisition and creation of subsidiary companies specialising in many sectors of this technology is an on going activity for the parent company Winn & Coales International.

The sharing of knowledge and new technology plus extensive research and development facilities enables the company to maintain its policy of producing high quality effective products around the world backed by a prompt and efficient service.

Denso South Africa (Pty) Ltd has a well established manufacturing facility in Durban and manufacturers products for the South and West African markets and international export markets. All the products are manufactured to the Winn & Coales (Denso) Ltd specifications.

Butch Duncan
Managing Director
Denso SA (Pty) Ltd

Leaders in Corrosion and Sealing Technology



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Specialists Agree

Within the construction industry, architects and engineers agree that of all the problems that can beset a building, inadequate waterproofing, above and below ground, creates the greatest havoc. The entry of moisture does not just ruin the décor or equipment; it can set up a whole chain reaction. Soil and atmospheric chemicals can become activated, and will attack the very structure of the building, without being immediately detectable. Thus over a period of time the damage is done.

Whether it is a multi million project cost, or a simple maintenance job, *you need to be sure.*

Time Proven and Tested

Denso WPM / DPM Products are supported by over 125 years experience in the manufacture of waterproofing and anti corrosive products by Winn & Coales International Ltd – our name is our guarantee and with our products there is no compromise.

Independent Tests

You will note references to independent test standards in the technical manual, with facts and figures on Page 6.

Denso Waterproof Systems are manufactured and certified to ISO 9001:2000.

Unequalled Safeguards

As part of Winn & Coales International Ltd, the Denso Waterproof Systems provide additional safeguards. Not only are they the beneficiary of the research and development programme, the products are tested and have proved successful in the extremes of climatic conditions.

Leaders in Corrosion and Sealing Technology

1. _____



How Denso WPM / DPM Outperforms the High Performers

The modern high performance waterproofing sheet membranes for tanking and roofing works come in various basic forms. Each formula or brand lays claim to various merits essential to good building practise and construction design.

Exceptional By Any Standard

The Denso high performance waterproofing sheet membrane system has Alpha SA Certificate of Approval and conforms to both British and American official test standards.

Time Proven Formula

The secret lies in the formula, which combines all the important time proven advantages of bitumen, with the robust flexibility of modern plastic sheetings. The Denso membrane utilises a modified heavy duty polyethylene core laminated on both sides by a modified bitumen.

A Membrane For All Applications

From this unique formula, a whole system of waterproofing membranes has been developed, utilising modern techniques, foils and polyesters to far greater advantage and economy than ever before.

Saves Time Saves Money

Denso WPM / DPM Products adjust precisely, and with ease, to all natural movement and its remarkable flexibility makes for economy of labour and ease of application. The maximum stretch is in excess of 300% in both directions at normal temperatures.

A Membrane For All Seasons

From Latitude 0 degrees – Latitude 60 degrees it makes no difference. Denso WPM / DPM Products have been tested and proven under all extremes of climate, and in service will withstand temperatures of -25c to + 80c without cracking or slumping.

Vapour And Rot Proof

Denso WPM / DPM products will withstand chemical attack and are both rot and vapour proof.

Technical Advisory Service

A prompt response to consultants for technical and design services.

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The Range of Denso WPM Products

Denso 1000 SA

A high performance, self adhesive sheet membrane constructed from an oriented laminate of high density polyethylene sheeting, laminated to a bitumen – polymer modified adhesive compound.

The product is a tough durable, self adhesive membrane with an overall thickness of 1.5mm / 20m² roll.

The primary use is for internal and external tanking to prevent the ingress of water and water borne salts such as chlorides and sulphates penetrating the concrete structure.

Technical Data

Colour: Dark grey / black
Bonding: Self adhesive
Backing thickness: 0.10mm
Backing Type: HDPE cross laminated
Adhesive thickness: 1.40mm
Total thickness: 1.50mm
Roll width: 1000mm
Roll length: 20m
Roll weight: 36kgs
Overlaps: 100mm

Mechanical Data

Membrane strength: 3.5N/mm
Elongation: 300%
Puncture resistance: 250N
Adhesion: 3.5N/mm

Safety

No special precautions required.

Storage Life

Store in cool, dry place
6 months at 5c.- 30c. max.

Applications

Tanking

Denso 2000 SA

A self adhesive waterproof membrane comprising an internal reinforcement of polyester carrier coated on both surfaces with a polymer modified bitumen adhesive compound. It is designed to provide a water and water vapour barrier as well as providing protection to concrete from attack by aggressive salts.

The product has excellent lay flat properties at an overall thickness of 2mm covering 15.20m² / roll with a 12 micron black torch off film. It is tough and durable and suitable for situations of high risk to damage.

Technical Data

Colour: Black
Bonding: Self adhesive / torch on
Total thickness: 2mm
Roll width: 950mm
Roll length: 16m
Roll weight: 34 kgs
Overlaps: 100mm

Mechanical Data

Elongation: 200%
Puncture strength: 260N
Tensile strength: 5N/mm width
Adhesion strength: 4 N/mm

Safety

No special precautions required

Storage Life

Store in cool dry place
6 months at 5c.- 30c. max.

Applications

Tanking / Roofing

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The Range of Denso WPM Products

Denso 3000 SA

A self adhesive waterproof membrane, comprising an internal reinforcement of polyester carrier coated on both surfaces with a polymer modified bitumen adhesive compound. It is designed to provide a water and water vapour barrier, as well as providing protection to concrete from attack by aggressive salts such as chlorides and sulphates.

The product has excellent lay flat properties at an overall thickness of 3mm covering 10.45m²/roll with a 12 micron torch off black film.

Technical Data

Colour: Black
Bonding: Self adhesive / torch on
Total thickness: 3mm
Roll weight: 32 kg
Roll width: 950mm
Roll length: 11m
Overlaps: 100mm

Mechanical Data

Tensile strength: 10N/mm
Elongation: 300%
Puncture resistance: 345N
Adhesion strength: 4N/mm

Safety

No special precautions required

Storage Life

Store in cool, dry place
1 year at 5c.- 30c. max.

Applications:

Tanking / Roofing

Denso 1750 SR/SA

A self adhesive solar reflective membrane designed for roof waterproofing large structures, and providing upstand protection with strong UV resistant capability. The membrane consists of an embossed aluminium foil laminated to polymer modified bitumen and comprising an internal reinforced polyester carrier.

Technical Data

Colour: Aluminium
Bonding: Self adhesive
Total thickness: 1.75mm
Roll weight: 2kg / m²
Roll length: 15m
Roll width: 0.75m
Overlaps: 100mm

Mechanical Data

Elongation: 20%
Puncture strength: 270N
Tensile strength: 6N/mm
Adhesion strength: 4 N/mm

Safety

No special precautions required

Storage Life

Store in cool dry place
1 year at 5c.- 30c. max.

Applications:

Roofing / Upstands



The Range of Denso WPM Products

Denso 4000 SA

A heavy duty self adhesive waterproof membrane, comprising an internal reinforcement of polyester carrier coated on both surfaces with a polymer modified bitumen adhesive compound. A polythene top sheet is also present.

It is designed to provide a water and water vapour barrier, as well as providing protection to concrete from aggressive salts, such as sulphates and chlorides.

Technical Data

Colour: Black
Bonding: Self adhesive / torch on
Total thickness: 4mm
Roll weight: 32 kg
Roll width: 950mm
Roll length: 7.5m
Overlaps: 100mm

Mechanical Data

Tensile strength: 10N/mm
Elongation: 300%
Puncture resistance: 345N
Adhesion strength: 4N/mm

Safety

No special precautions required

Storage Life

Store in cool, dry place
1 year at 5c. - 30c. max.

Applications

Tanking / Roofing.

Denso 2300 SR/SA

A self adhesive solar reflective membrane designed for roof waterproofing large structures, and providing upstand protection with strong UV resistant capability. The membrane consists of an embossed aluminium foil laminated to polymer modified bitumen and comprising an internal reinforced polyester carrier.

Technical Data

Colour: Aluminium
Bonding: Self adhesive
Total thickness: 2.30mm
Weight: 2.3kg / m²
Roll length: 15m
Roll width: 750m
Overlaps: 100mm

Mechanical Data

Elongation: 20%
Puncture strength: 270N
Tensile strength: 6N/mm
Adhesion strength: 4N/mm

Safety

No special precautions required

Storage Life

Store in cool dry place
1 year at 5c.- 30c. max.

Applications

All roofing details.

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The Range of Denso WPM Products

Denso Primer D QD

A solvent based solution of polymer modified bitumens.

A fast drying (QD=quick drying) bitumen primer for all surfaces prior to the application of the Denso range of WPM / DPM products.

Technical Data

Colour: Black

Solids content: 43%

Specific gravity: 0.94

Flash point: < 24c

Nominal coverage: 8m² / lt

Drying time: 20 mins

Safety

The material is flammable and should not be applied in the vicinity of naked flames or sources of ignition.

Storage Life

Store in cool, dry place away from sources of ignition. Avoid contact with the skin and the inhalation of vapours. Always ensure that adequate ventilation is provided. Max. shelf life – 6 months.

Applications

Tanking / Roofing.

Standards Conformity

Denso waterproof membranes and the ancillary products conform to the following standards.

South African Bureau ISO 9001-2000. Quality Standard.
Certificate No. ACS 0100/01.

Mechanical Properties

Membrane strength: ASTM D1000.

Elongation: ASTM D1000.

Puncture resistance: ASTM E154.

Adhesion: ASTM D1000.

Functional Data

Water vapour transmission: ASTM E96.

Water penetration joint: MOAT 27 5.1.4.

Longitudinal stability: MOAT 27 5.1.6



Fixing Techniques

General Preparation

The fixing of the range of self adhesive and solar reflective Denso Waterproof Membranes for roofing and tanking works is fast and simple.

The preparation of the substrate is the same as for conventional materials. All surfaces must be structurally sound, smooth, dry and free from any indentations or sharp protrusions. Corners must be chamfered or filleted.

The surface must then be treated with Denso Quick Drying Bitumen Primer in preparation of receiving the selected Denso Waterproof Membrane (WPM).

Torch On

With this technique the Denso WPM bitumen base is activated by means of a propane torch to form a powerful bond to the substrate. This technique allows for the 12 micron black film that is applied to the self adhesive bitumen to be **torched off** while the membrane is fixed to the substrate.

Strong 100mm weld overlaps are also achieved to provide a completely integrated membrane to the entire roof / tanking area.

Loose Laid

In the case of the inverted roof or protected membrane system, it is necessary only to torch on to the primed upstands and 300mm into the surface of the roof. The 100mm overlaps are repeated as with the **torch on** system, but the main area is loose laid and ballast loaded to prevent wind uplift.

For application details see pages: 8-10, 11, 12, 15, 16, 17, 18.

Dual Application

Denso 2000 SA and 3000 SA WPM products are designed as self bonding membranes but also have a torch joint welding capability when adverse site conditions demand it. To fix the dual application systems, simply peel back the release sheet, and firmly press bond the membrane to the primed substrate.



Denso Primer D

A QD Primer for concrete surfaces where membranes are to be bonded.

Technical Data

Material: QD bitumen primer
Colour: Black
Drying Time: 20mins @ 23c
S.G: 0.94
Flash Point: <24c
Coverage: 8m² / lt
Packaging: 25 lts

Bitumen Mastic *

A trowel grade adhesive for fibre fillets.

Technical Data

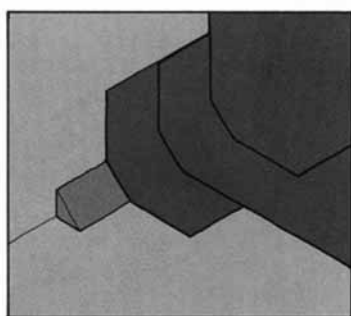
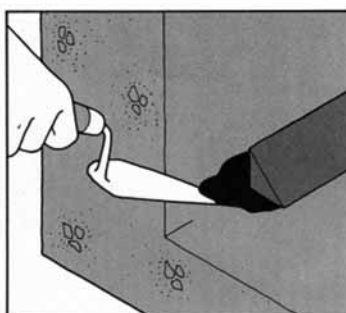
Material: Bitumen Mastic
Colour: Black
Coverage: 1.5m² / lt
Drying Time: <24 hours
Flash Point: >32c
Packaging: 5 lts

Rubber Bitumen*

A solvent free sealant for joints and chases.

Technical Data

Material: rubber bitumen
Coverage: 1lt / 2.5 lm
Colour: Black
Operating Temp: <80c
Drying Time: 6-8 hours - 14 days / water immersion.
Packaging: 5 lts



Fibre Board Fillet.*

For rapid fillet formation to walls and abutments.

* MasterProofer Range of Products



Central Placed Waterstop*

Water retention works placed horizontally and for water retention or exclusion to roofs / ceilings below ground.

External Placed Waterstop*

For vertical applications on water excluding structures, & under base slab in water retaining / excluding structures.

Fibre Board*

A GP filler board suitable for basements and retaining walls.

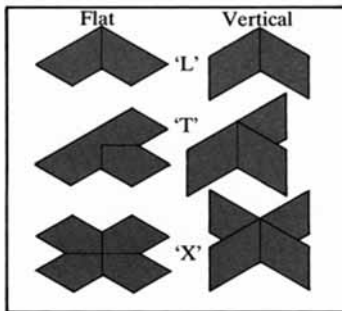
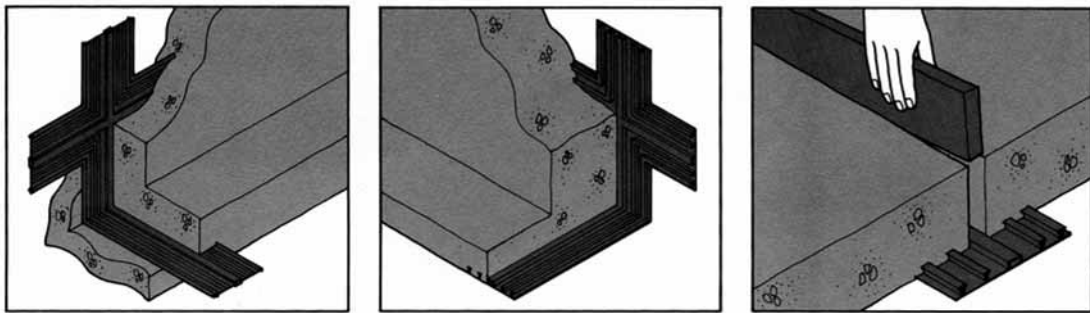
Technical Data for centrally / externally placed waterstops

Types: PVC dumbbell / centrebulb.

Tensile strength: 140kg/cm²

Elongation break: 300%

Softness: 45% at 20c



Butt welds can be made on site.
Other joints can be made using the junction pieces listed above.

* MasterProofer Range of Products



Foam Filler Board*

Polyethylene backing board for sealing compounds to which it will not adhere. To be used where considerable expansion is expected.

Technical Data

Material: Expanded polyethylene
Colour: White
Density: 30kg/m³
Compression recovery: 90% min. @50% compression.
Water absorption: MG/em² 0.70
Sheet size: 2.20m x 1.20m

Sealant*

A Polysulphide sealant for previously primed expansion and contraction joints.

Technical Data

Material: Non staining two part sealant in gun or pouring grades.
Colour: Grey
Solids: 98%.
Container: 2.25lts
Coverage: 2.25lts / 5.5lm At 20x20mm rebated joints.

Denso 1750 SR Flashing

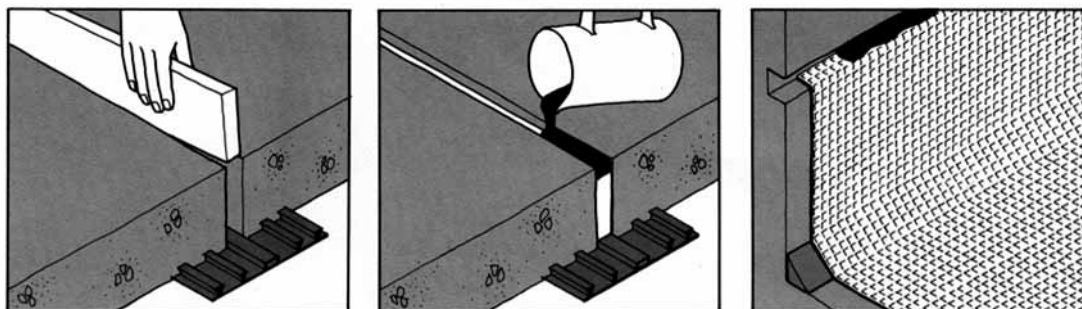
For sealing abutments, upstands, and projections.

Technical Data

Material: Aluminium foil faced self adhesive bitumen sheet.
Colour: Silver.
Bitumen thickness: 1.75mm
Aluminium: 0.08mm
Roll length: 15m
Roll width: 950mm
Tensile strength: 6.0 N/mm
Puncture resistance: 270 N.
Adhesion: 4.0 N/mm

Primer:

"P" for porous surfaces.
"N" for non porous surfaces.
Coverage: 1lt / 40lts sealant.

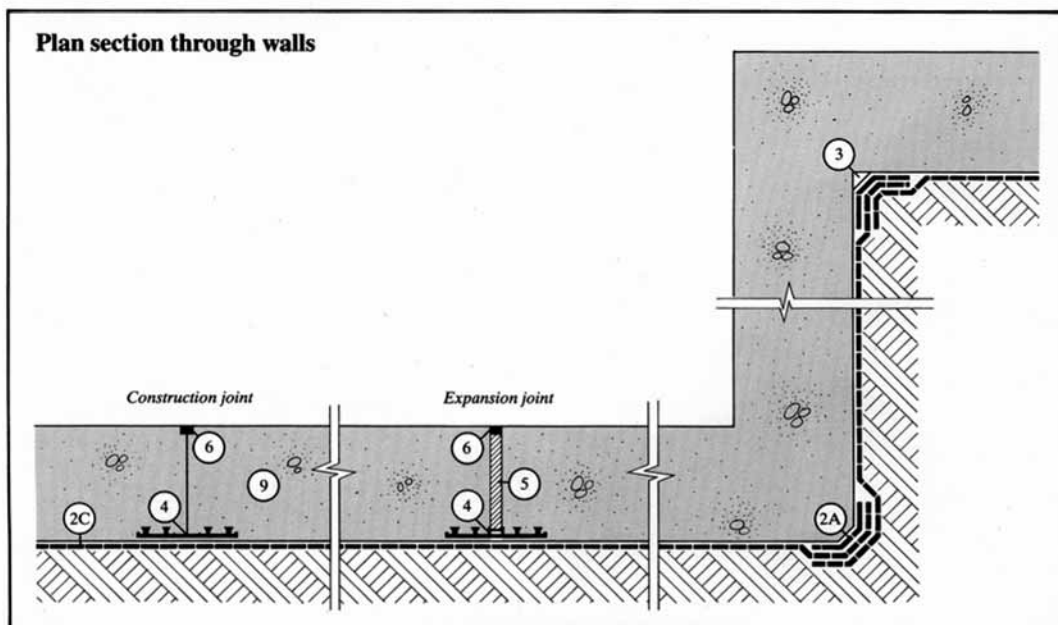
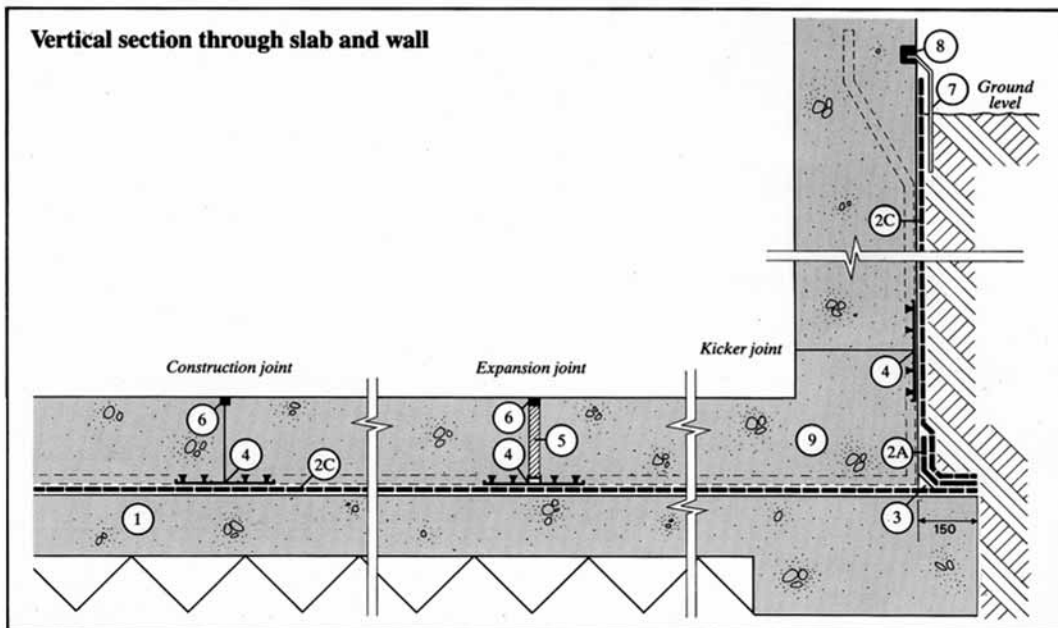


* MasterProofer Range of Products



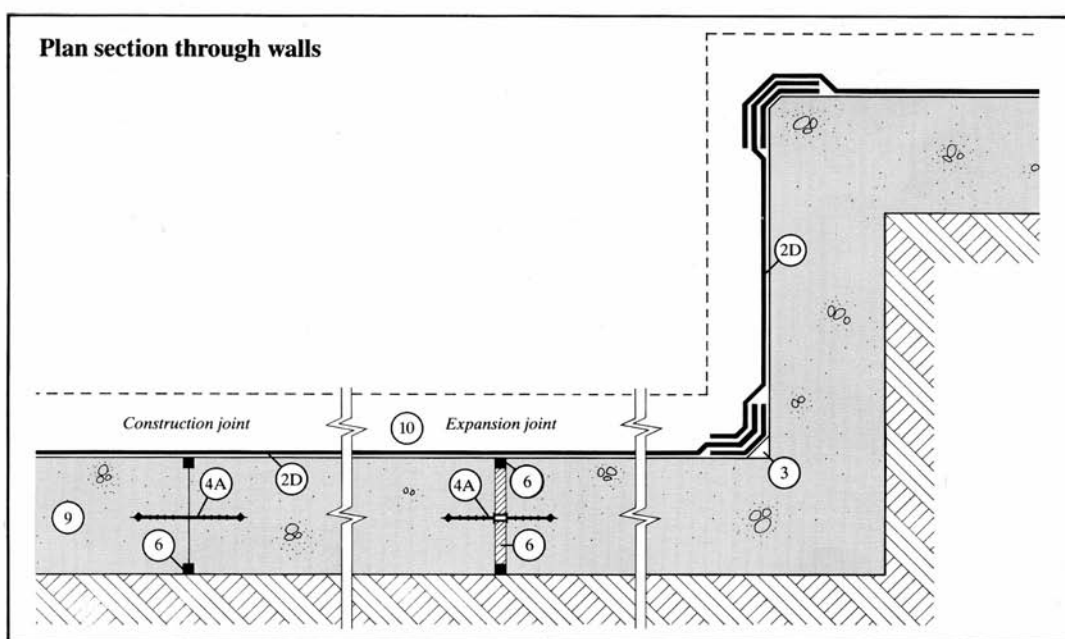
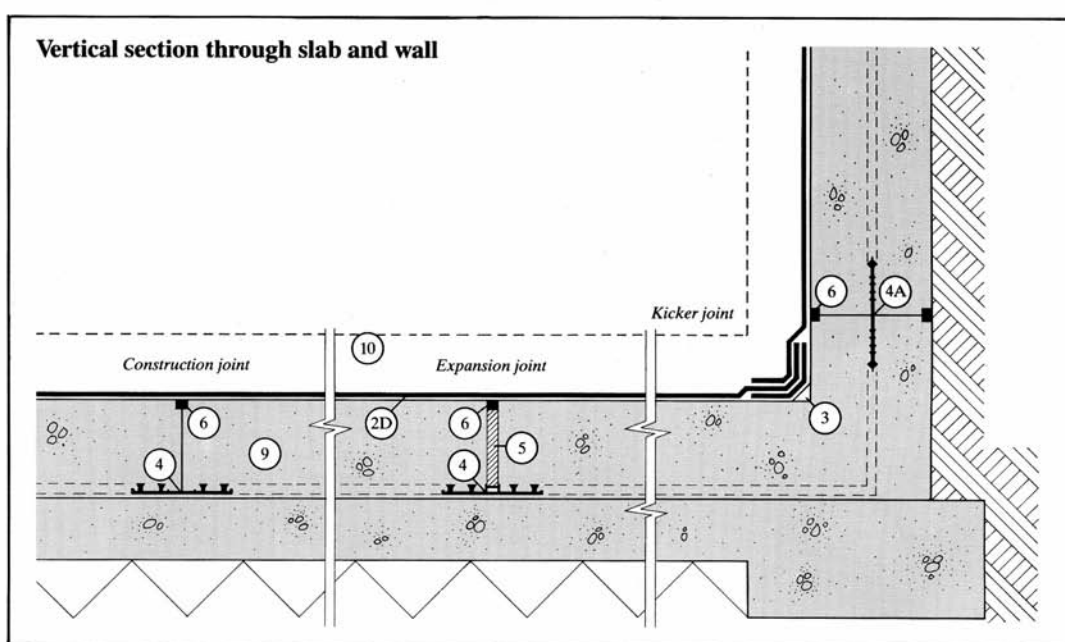
Tanking details – water excluding

- | | |
|-------------------------------|----------------------------|
| 1. Oversite concrete. | 6. Polysulphide sealant. |
| 2A. Denso 3000 SA | 7. Denso 1750 SA SR. |
| 2C. Denso 1000 SA. / 2000 SA. | 8. Rubber bitumen sealant. |
| 3. Fibre fillet. | 9. Concrete structure. |
| 4. External waterstops. | |
| 5. Filler board. | |



Tanking details – water retaining

- | | |
|---|---------------------------------------|
| 1. Detail on oversite concrete. | 5. Filler board. |
| 2D. Denso 1000 SA. / 2000 SA. | 6. Polysulphide sealant. |
| 3. Denso 3000 SA applied to fibre fillet. | 9. Concrete structure. |
| 4. External waterstop. | 10. Vertical wall to designer's spec. |
| 4A. Central waterstop. | |



**Project File - Nigeria
Protection Below Ground**



Project: Shell Ltd, Abuja



Substructure protected with Denso 3000 SA waterproof membrane. Tanking supplied and applied by MasterProofer Ltd, Lagos.

Project: Central Bank of Nigeria, Katsina



Substructure protected with Denso 3000 SA waterproof membrane. Tanking supplied and applied by MasterProofer Ltd, Lagos.

Denso Waterproofing Membranes Distributed by: MasterProofer Ltd, Lagos



Project File - Nigeria Protection Below Ground

Project: Protea Hotel, Victoria Island, Lagos



Substructure protected with Denso 1000 SA waterproof membrane. Tanking supplied and applied by MasterProofer Ltd, Lagos.

Project Details

Shell Ltd, Federal Capital, Abuja

Product Specified:	Denso 3000 SA
Architects:	N/A
Structural Engineers:	Morgan Omonitan & Abe.
Main Contractors:	Costain (West Africa) Plc.

Central Bank of Nigeria, Katsina

Product Specified:	Denso 3000 SA
Architects:	N/A
Structural Engineers:	Civ-Struct Associates
Main Contractors:	Cappa and D'Alberto Plc.

Protea Hotel, Victoria Island, Lagos

Product Specified:	Denso 1000 SA
Architects:	Design Group Nigeria
Structural Engineers:	Ove Arup & Partners Nigeria
Main Contractors:	Grinaker-LTA Construction Ltd.

Denso Waterproofing Membranes Distributed by: MasterProofer Ltd, Lagos

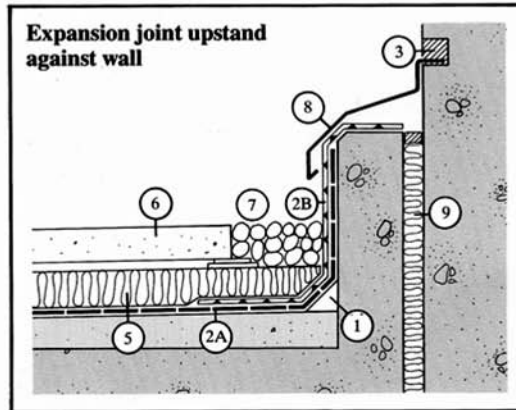
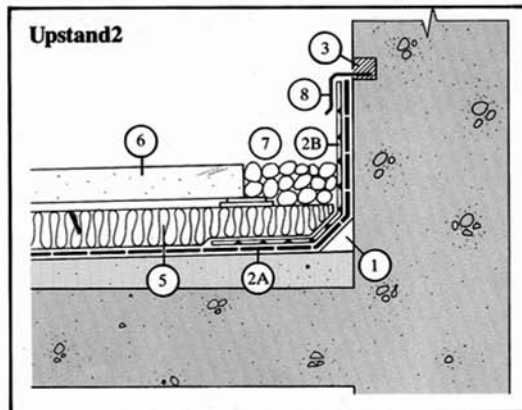
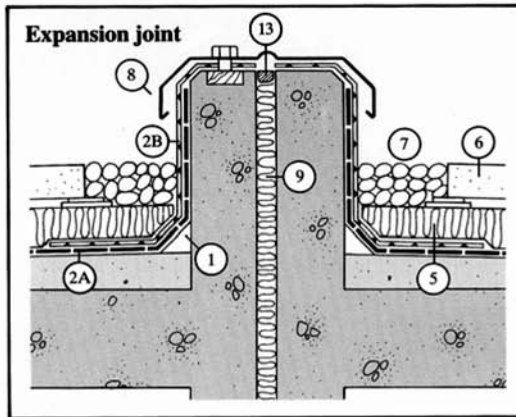
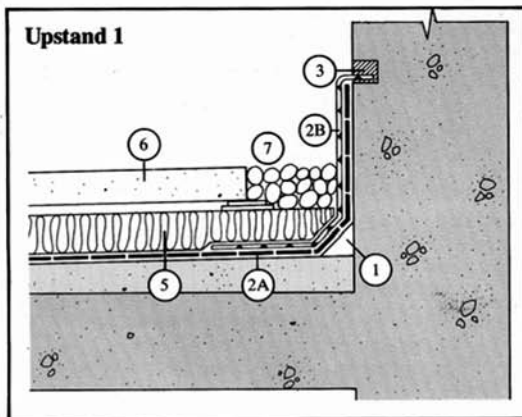
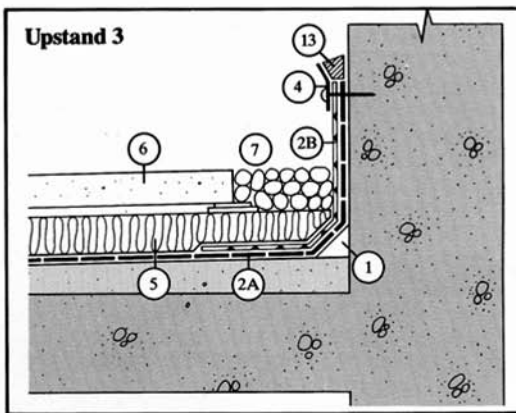


Roofing details

1. Fibre fillet.
- 2A. Denso 3000 SA.
- 2B. Denso 1750 SR/SA.
- 2C. Denso 3000 SA/4000SA.
- 2D. Denso 2000 SA.
3. Rubber bitumen sealant.

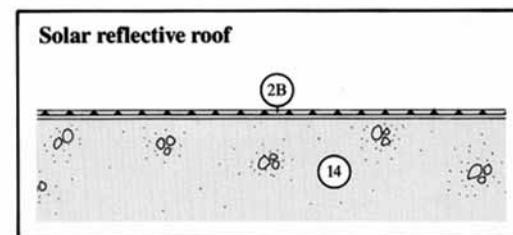
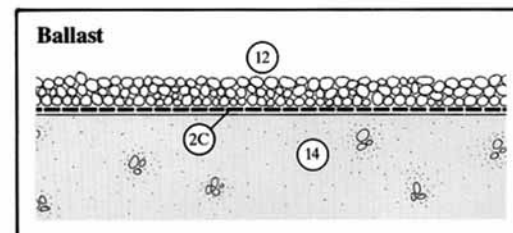
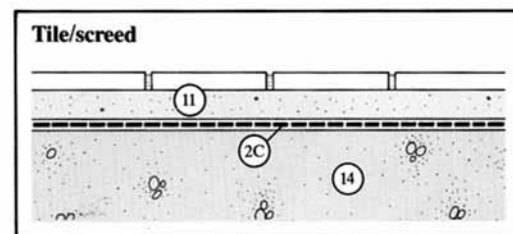
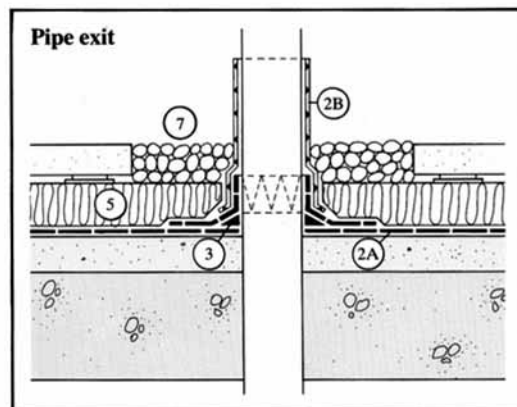
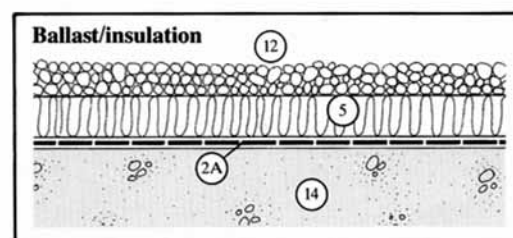
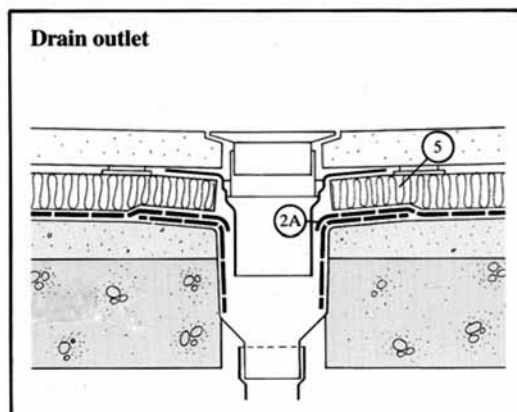
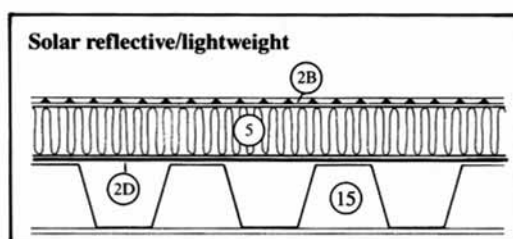
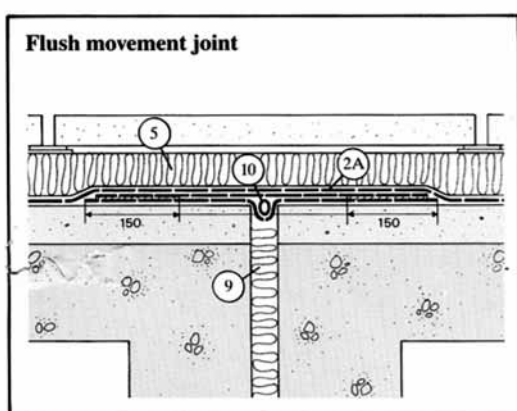
General specification

These drawings show the ideal roofing specifications. 50mm sand cement screed can replace the thermal insulation boards if required. The Denso 1750 SR/SA solar reflective aluminium foil faced membrane can be laid without protection and is ideal for light weight roofing structures.



Roofing details

4. Denso 1750 SR/SA strip.
5. Thermal insulation.
6. Paving slab.
7. 20-40mm aggregate.
8. Denso 1750 SR/SA flashing.
9. Foam filler board.
10. Polythene tube.
11. Tiles set in sand / cement.
12. 50mm round aggregate.
13. Polysulphide sealant.
14. Concrete roof.
15. Metal desk.





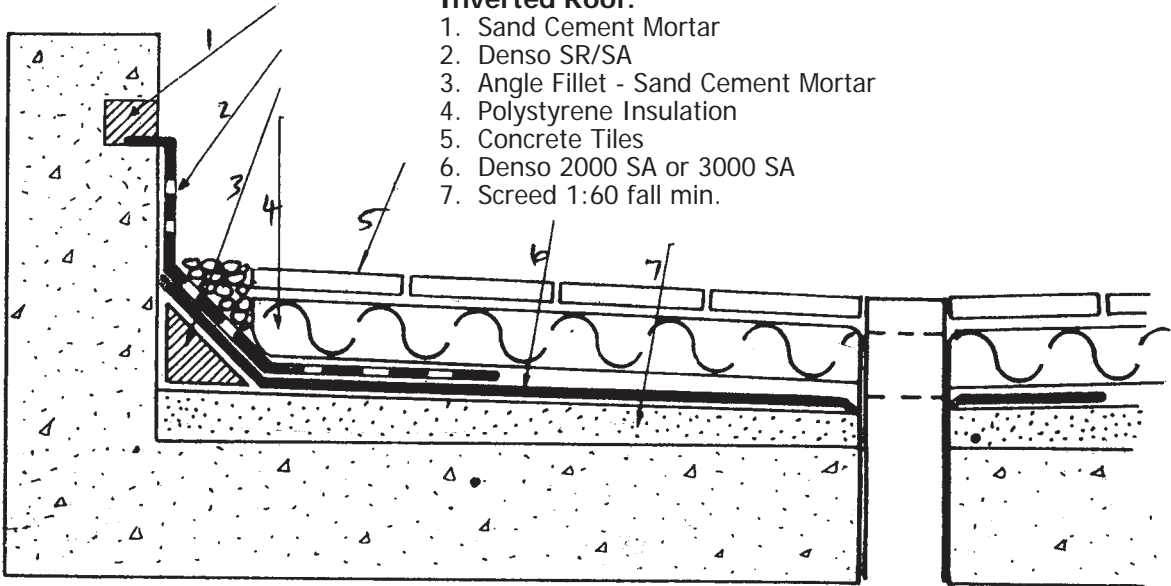
Leaders in corrosion prevention and sealing technology

Inverted Roof

Diagram A

Inverted Roof:

- 1. Sand Cement Mortar
- 2. Denso SR/SA
- 3. Angle Fillet - Sand Cement Mortar
- 4. Polystyrene Insulation
- 5. Concrete Tiles
- 6. Denso 2000 SA or 3000 SA
- 7. Screed 1:60 fall min.

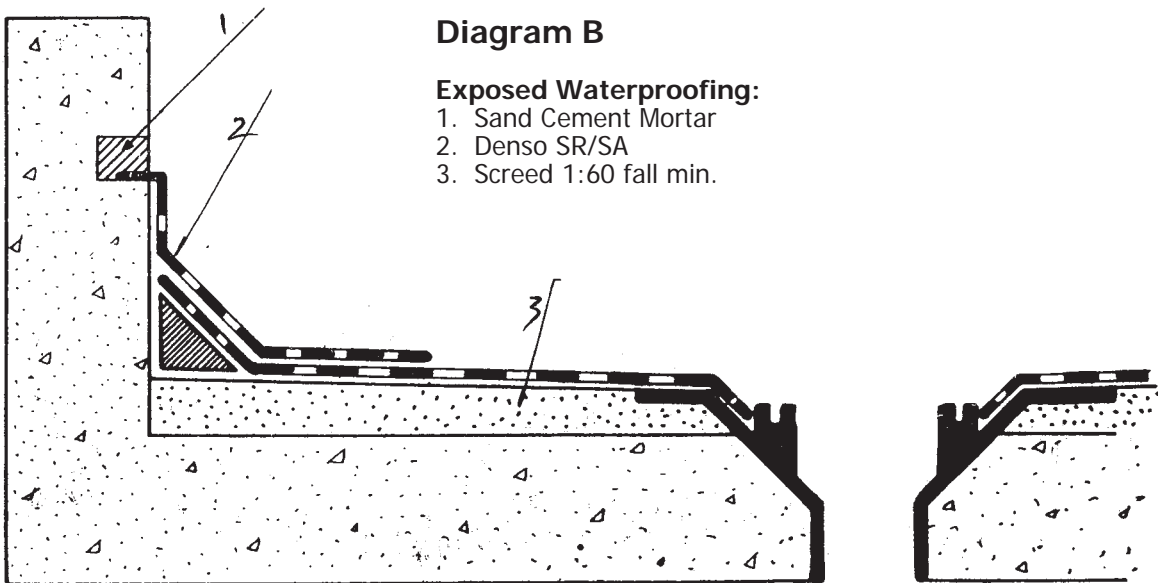


Exposed Waterproofing

Diagram B

Exposed Waterproofing:

- 1. Sand Cement Mortar
- 2. Denso SR/SA
- 3. Screed 1:60 fall min.





Finished Details

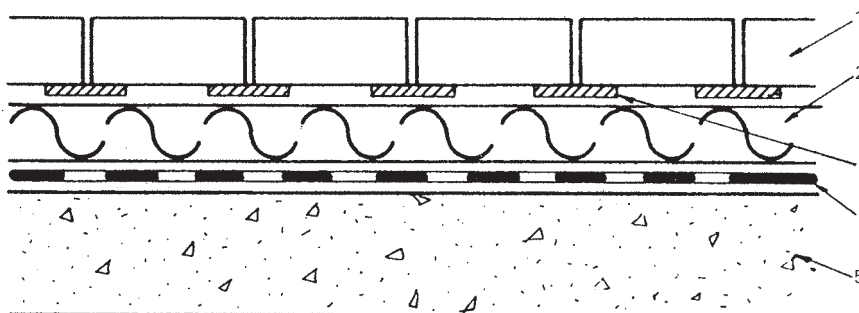


Diagram C

Finished Details:

1. Concrete Tiles
2. Thermal Insulation
3. Spacer Pads or equivalent
4. Denso WPM Membrane
5. Concrete Roof Slab

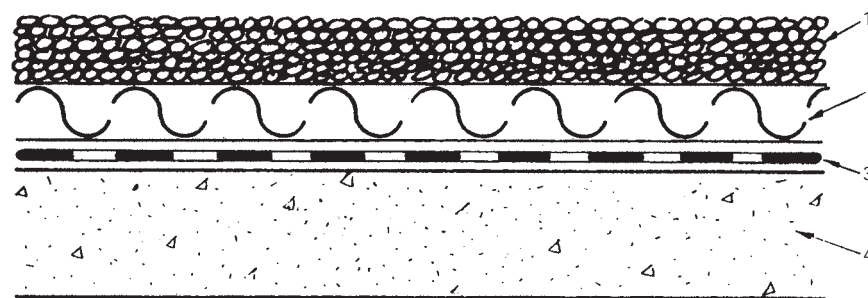


Diagram D

Finished Details:

1. 50mm Crushed Stone
2. Thermal Insulation
3. Denso WPM Membrane
4. Concrete Roof Slab

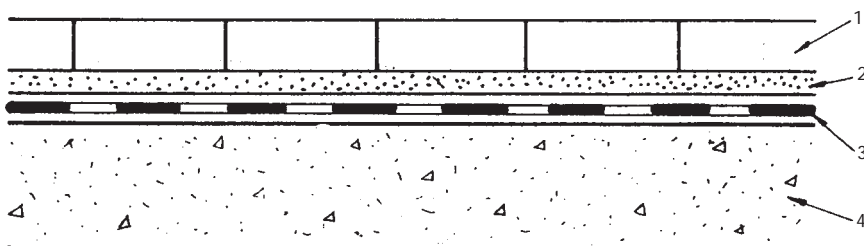


Diagram E

Finished Details:

1. Concrete Tiles
2. Reinforced Screed
3. Denso WPM Membrane
4. Concrete Roof Slab

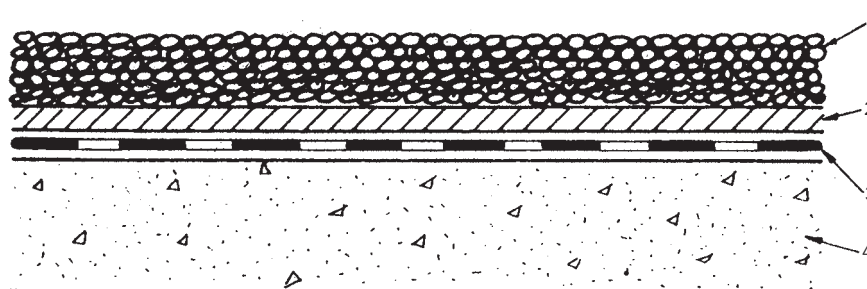


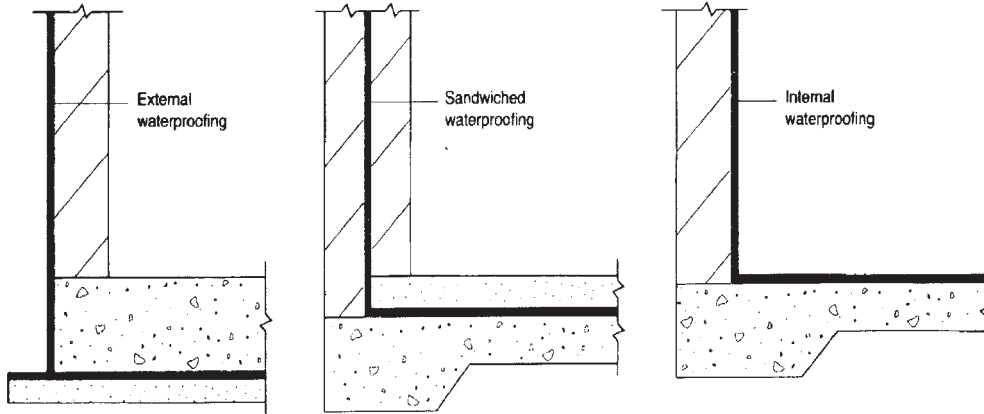
Diagram F

Finished Details:

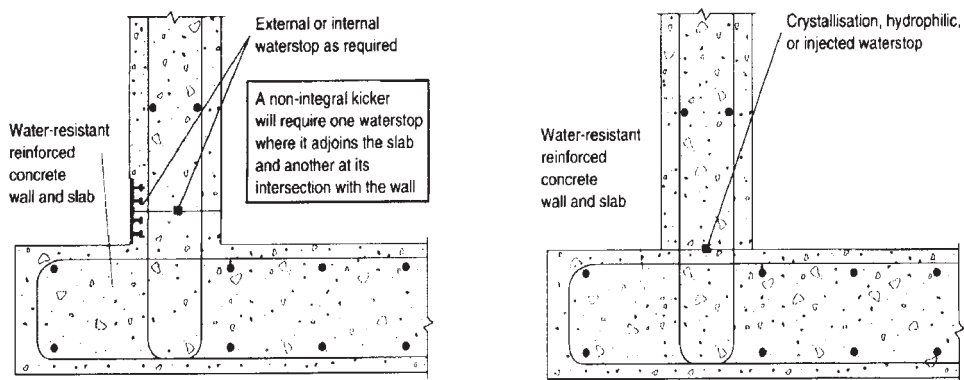
1. 50mm Crushed Stone
2. Polyester Matting 300gsm
3. Denso WPM Membrane
4. Concrete Roof Slab



Water resisting forms of Construction

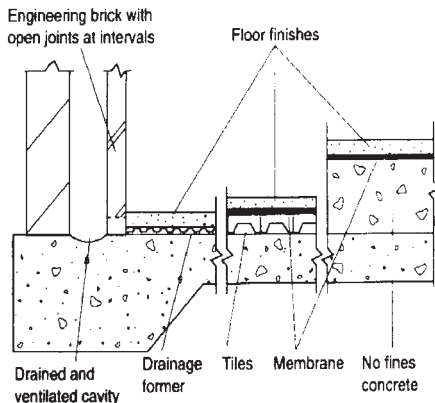


Type A structures - tanked protection

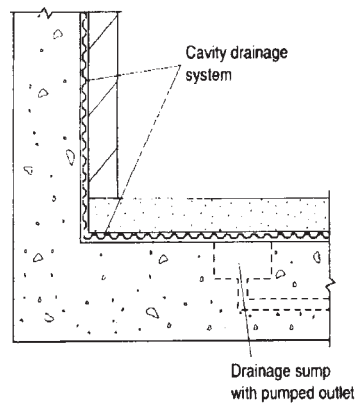


Type B structures - structurally integral protection

Floor drainage options



Preformed cavity floor and wall drain system



Type C structures - drained protection



Recent Case Histories

Project	Product	Date
Churchgate Phase One V.I. - Lagos	Denso 2000 SA	2006
Churchgate Phase One V.I. - Lagos	Denso 1000 SA	2007
BriscoeFord Showroom Lekki - Lagos	Denso 2000 SA	2008
BriscoeFord Showroom Lekki - Lagos	Denso 1750 SR/SA	2008
Commercial Offices - Lagos	Denso 2000 SA	2008
Commercial Office Lekki - Lagos	Denso 1750SR/SA	2008
Central Bank of Nigeria - Katsina	Denso 3000 SA	2006
Central Bank of Nigeria - Katsina	Denso 1750 SR/SA	2008
Central Bank of Nigeria - Asaba	Denso 2000SA	2007
Shell Ltd - Abuja	Denso 3000 SA	2007
Protea Hotel - Lagos	Denso 3000 SA	2007
Protea Hotel - Lagos	Denso 2000 SA	2007
Protea Hotel - Lagos	Denso 1000 SA	2007
Brasol Hotel - Lagos	Denso 3000 SA	2007
Ikoyi Residential - Lagos	Denso 2000SA	2007
Ikoyi Residential - Lagos	Denso 1750 SR/SA	2007
Guaranty Trust Bank PLC Office - Lagos	Denso 1000SA	2008
Beach House Ishayi - Lagos	Denso 2000SA	2007
Lagos Civic Centre V.I. - Lagos	Denso 3000SA	2007
NIB Citibank V.I. - Lagos.	Denso 3000SA	2007
WA Business Association - Lagos	Denso 2000SA	2005
National Theatre - Lagos	Denso 1000SA	2004
National Theatre - Lagos	Denso 2000SA	2004
National Theatre - Lagos	Denso 1750 SR/SA	2004

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