

# 4421WB WPS BITUFLAME® MEMBRANE ROOFING

## 1. GENERAL

*If you have pre-customised this work section using the "questions and answers" provided as part of the downloading process, it may be necessary to amend some clauses to suit the final project-specific version.*

*The section must still be checked and customised to suit the project being specified, by removing any other irrelevant details and adding project-specific details and selections.*

This section relates to **Waterproofing Systems Ltd** bituFLAME® membrane roofing, bonded to:

- construction plywood, including all underlays and accessories
- concrete, including all underlays and accessories

*Modify or extend the above description to suit the project being specified.*

*The bituFLAME® double layer system is recommended for plywood and concrete substrates. The bituFLAME® double layer vented system is used where moisture needs to be vented from the roof.*

### 1.1 RELATED WORK

Refer to ~ for ~

*Include cross references to other sections where these contain related work.*

#### Documents

### 1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

[NZBC E2/AS1](#) External moisture  
[AS/NZS 2269.0](#) Plywood - Structural - Specifications

*Delete from the DOCUMENTS clause any document not cited. List any additional cited documents.*

*The following are related documents and if referred to in the work section need to be added to the list of DOCUMENTS:*

*NZBC E1/AS1 Surface Water  
BRANZ BU 472 Waterproof decks  
BRANZ publication Selecting roof claddings*

### 1.3 MANUFACTURER/SUPPLIER DOCUMENTS

Manufacturer's and supplier's documents relating to this part of the work:

Waterproofing Systems Ltd Product Manual (2014 edition)

Standard detailed drawings

[BRANZ Appraisal 404](#) - bituFLAME® Roof Membrane Systems

Manufacturer/supplier contact details

Company:	<b>Waterproofing Systems Ltd</b>
Web:	<a href="http://www.waterproofing.co.nz">www.waterproofing.co.nz</a>
Email:	<a href="mailto:info@waterproofing.co.nz">info@waterproofing.co.nz</a>
Telephone:	09 579 1460 or 0508 (2WATER) 292837
Northland, Auckland	021 - 917 773
Waikato, Bay of Plenty	021 - 457 953
Wellington & Lower North Island	027 - 5445 532
Christchurch, South Island	027 - 5445 532

*It is important to ensure that all personnel on site have access to accurate, up to date technical information on the many products, materials and equipment used on a project. In most cases individual products are not used in isolation, but form part of a building process. Also a particular manufacturer's and/or supplier's requirements for handling, storage, preparation, installation, finishing and protection of their product can vary from what might be considered the norm. Access to technical information can help overcome this potential problem.*

#### Warranties

*Use for listing all warranties relating to this section. Supplier and manufacturer warranties are those that are freely offered by the supplier or manufacturer, similarly installers and applicators.*

*They are usually in their standard form and subject to their terms and conditions. Check the general section 1237 WARRANTIES for the date of commencement of warranties; which is normally*

*practical completion of the contract, although not all suppliers, manufacturers, installers or applicators will agree to this. Refer to the chosen conditions of contract as it may also contain information on warranties.*

#### 1.4 WARRANTY - MANUFACTURER/SUPPLIER

Provide a materials warranty in the suppliers standard form.

Warranty period: 20 years materials double layer system

From: Date of completion of the application

*Supplier and manufacturer warranties are those that are freely offered by the supplier or manufacturer. They are usually in their standard form and subject to their terms and conditions. Waterproofing Systems Ltd issue warranties on the basis that installations comply with their specification requirements and their on-site Quality Control process has been completed. Where a project is registered, WPS will provide assistance in design and product selection.*

#### 1.5 WARRANTY - INSTALLER/APPLICATOR

Warrant this work under normal environmental and use conditions against failure.

Warranty period: 5 years

Refer to the general section for the required form of 1237WA WARRANTY AGREEMENT and details of when completed warranty must be submitted.

*Check general section 1237 WARRANTIES for the date of commencement of warranties; which is normally practical completion of the contract. Refer to the chosen conditions of contract as it may also contain information on warranties/guarantees.*

#### Requirements

#### 1.6 QUALIFICATIONS

Roofing work to be carried out by applicators approved by Waterproofing Systems Ltd to install the bituFLAME<sup>®</sup> membrane system, and who hold a Licensed Building Practitioner's licence for external membrane applications.

#### 1.7 NO SUBSTITUTIONS

Substitutions are not permitted to any specified Waterproofing Systems Ltd system, or associated components and products.

#### Performance

#### 1.8 PRE INSTALLATION MEETING

Convene a meeting between the applicator, contractor, all associated consultants and Waterproofing Systems Ltd to ensure all parties know what is required for effective performance of the system.

#### 1.9 SPECIAL DETAILS

Where a standard detail does not exist, or if a standard detail cannot be applied, an approved alternative must be obtained from Waterproofing Systems Ltd before proceeding with the installation.

#### 1.10 TEST

Flood test horizontal applications with a sprinkler system for 2 hours. Make good any lack of water tightness when the surface is completely dry.

*Not all applications can be checked. All gutters should be checked.*

#### 1.11 PERFORMANCE

Accept responsibility for the weather-tight performance of the completed roofing system, including all penetrations through the roof and junctions with walls and parapets.

*Refer to later EXECUTION clause on co-operating with others on the installation of elements which penetrate or adjoin the roofing system; including walls and parapets, skylights, sundry elements fixed through the roofing surface, service pipework etc.*

#### 1.12 QUALITY ASSURANCE

Maintain quality necessary to assure that work is performed in accordance with this specification and the qualifying requirements of Waterproofing Systems Ltd.

Ensure that the applicator's Quality Control sheets are completed fully and faithfully for each installation area.

## 2. PRODUCTS

### Materials

- 2.1 PRIMER  
bituPRIME quick drying bituminous primer compatible with the waterproofing membrane and formulated to prepare the substrate for optimum application of the membrane.
- 2.2 SELF ADHERED BASE SHEET  
bituFLAME Plura AD, an APP modified bitumen base sheet with glass reinforcement 2.5mm thick base sheet with a peel off removable backing all marked with the manufacturer's mark.  
*BituFLAME Plura AD to be used where an open flame cannot be applied to a substrate.*
- 2.3 BITUBOND® WB ADHESIVE  
Liquid applied bituminous adhesive all marked with the manufacturer's mark for areas of installation where a torch cannot be safely used and areas specified in Waterproofing Systems Ltd specifications or when the membrane system is being installed using the cold-applied adhesive method.
- 2.4 DOUBLE LAYER WATERPROOFING MEMBRANE SYSTEM  
Double layer waterproofing membrane system comprised of:  
- bituFLAME® BS, an AAP modified bitumen 0.9mm thick base sheet with glass fibre reinforcement.  
- bituFLAME® CS, an AAP modified bitumen 4mm thick exposed waterproofing membrane with 180 gsm composite spunbond reinforcement with a mineral chip finish all marked with the manufacturer's mark.  
*Available bituFLAME® finishes are sand finish or granule finish. Granules available in black or green.  
Sand finish membranes must be protected against UV exposure by finishing in Sungard.  
Waterproofing Systems recommend granule finished membranes as this avoids the need to keep recoating with the UV coating.*
- 2.5 DOUBLE LAYER VENTED SYSTEM  
Double layer vented system comprised of:  
- bituFLAME® VBS, an APP modified bitumen 0.9mm thick base sheet, with a mass of 0.745 kg/m<sup>2</sup> and 119 holes/m<sup>2</sup>.  
- bituFLAME® BS, an APP modified bitumen 3mm thick base sheet with glass fibre reinforcement.  
- bituFLAME® CS, an APP modified bitumen 4mm thick cap sheet with 180 gsm composite spunbond reinforcement with a mineral chip finish all marked with the manufacturer's mark.  
*A vented system is recommended when there is a risk of moisture that needs venting from the roof system.*
- 2.6 BITUFLAME RE-ROOF CAP SHEET  
bituFLAME® Re-Roof, a 4mm thick APP modified bitumen with 180gsm composite spun bound reinforcement with a mineral chip finish all marked with the manufacturer's mark.  
*Suitable as a re-roof cap sheet for direct overlay of existing bitumen membranes, including mineral chip finishes, pour-on bitumen and asphalt finishes.*
- 2.7 BITUFLAME VIADUCT  
bituFLAME® Viaduct, a 5mm thick modified bitumen specially formulated for asphalt overlays.  
*Suitable for asphalt overlay for bridges and car parks.*
- 2.8 BITUFLAME ANTI-ROOT  
bituFLAME® Anti-Root, a 5mm thick modified bitumen containing specially formulated anti-root additive properties, providing a barrier to plant and root penetration.  
*Suitable for planter boxes, green roofs and as a tanking cap sheet where aggressive plant and vegetation is identified risk to a tanking membrane.*

## Components

- 2.9 RING CLAMP DROPPER  
drainRite ring clamp dropper available in sizes 80mm, 100mm and 150mm diameter supplied and required by Waterproofing Systems Ltd.
- 2.10 RING CLAMP OVERFLOW DROPPER  
drainRite ring clamp overflow dropper available in sizes 80mm, 100mm and 150mm diameter supplied and required by Waterproofing Systems Ltd.
- 2.11 SCUPPER  
flowRite scupper available in sizes 200mm x 75mm, 100mm x 100mm and 65mm x 100mm supplied and required by Waterproofing Systems Ltd.
- 2.12 OVER FLOW SUMP  
drainRite overflow sumps available in sizes 455mm x 310mm x 187mm deep and 470mm x 290mm x 80mm deep as supplied and required by Waterproofing Systems Ltd.
- 2.13 ROOF VENTS  
ventRite available in size 200mm high x 75mm diameter supplied and required by Waterproofing Systems Ltd.  
*Air vents are recommended on any confined roof space cavity to provide ventilation and reduce the stress on the roof system. At least two vents are required for each roof space, or a maximum of one vent per 70m<sup>2</sup> of roof area. Where the roof space is part of ventilation system, then specific design should apply. Additionally, WPS air vents can be used to vent substrate moisture that might occur during inclement weather during installation or contained within the substrate.*
- 2.14 PIPE BOOTS  
WPS flashRite moulded unreinforced pipe boots supplied and required by Waterproofing Systems Ltd. Designed to fit 20mm-150mm penetrations. Boots are welded to substrate and mechanically clamped and sealed around pipes.
- 2.15 METAL TRIM  
Standard and purpose made metal trim to Waterproofing Systems Ltd details and to suit the specific location.

## Coatings

- 2.16 CLEAR COATING  
Crystal Glaze, a clear coating which binds mineral chips, thereby preventing mineral chip loss. Also contains an anti-lichen and moss additive. Available in 10 litre pails all marked with the manufacturer's mark.  
*Note: Crystal Glaze used only on bituFLAME<sup>®</sup> mineral chip finishes.*
- 2.17 LIQUID APPLIED ACRYLIC COATING  
Gripset RD, a liquid applied acrylic coating applied to mineral chip finishes for specialist colour requirements.  
Note: Application of Bondseal Primer is required before applying the Gripset RD coating.
- 2.18 BITUMINOUS ALUMINIUM COATING  
Sungard, a bituminous aluminium coating applied to sand finished bituFLAME<sup>®</sup>. Available in 10 litre pails all marked with the manufacturer's mark.

## Accessories

- 2.19 PAVER SUPPORTS - ADJUSTABLE WITH LEVELLING HEAD  
WPS ecoJack Adjustable Paver Supports with levelling head, comprised of a base, height control ring, a threaded top and a 3mm high levelling disc. Extension ring provides adjustable height from 42mm to 451mm. Levelling head provides up to 5% slope justification.  
*Suitable for flat roof and trafficable decks with uneven surface or slope.*

### 3. EXECUTION

#### Conditions

#### 3.1 GENERALLY

Install all products in accordance with Waterproofing Systems Ltd Product Manual (2014 edition).

Work and materials to Waterproofing Systems Ltd product method statements and specifications.

#### 3.2 STORAGE

Take delivery of rolls undamaged and include for site handling facilities where required. Stack on end, off the ground on a level surface, out of sunlight and above 5°C and with accessories. Do not allow rolls to become crushed.

#### 3.3 CONFIRM LAYOUT

If not detailed on the drawings, confirm the layout to suit site conditions, and Waterproofing Systems Ltd specification.

*On sloping surfaces >1 in 40, it is usual to lay up the slope. Lay roofs to a minimum fall of 1:30.*

#### Application - preparation

#### 3.4 PRELIMINARY WORK

Ensure that preliminary work, including formation of falls, flashing rebates, provision of battens and fillets and fixing of vents and outlets to levels, is complete and properly constructed to enable the system to work as intended. Ensure timber fillets fit neatly and that mitres are neatly formed. This work and the substrate to be smooth, clean and dry. Identify areas of potential movement and plan for movement joints.

#### 3.5 ACCEPTANCE OF SUBSTRATE

Confirm that the substrate complies with the [NZBC E2/AS1](#) for the relevant substrates and Waterproofing Systems Ltd documents, including fillets, sumps, outlets and projections, and ensure work of the required standard. Ensure the fall complies with E2/AS1 including correct fall to rainwater outlets to avoid ponding,

- Lay roofs to a minimum fall of 1:30 (2°) to [NZBC E2/AS1](#), 8.5.1 a.

- Lay decks to a minimum of 1:40 (1.5°) to [NZBC E2/AS1](#), 8.5.1 b.

- Lay gutters to a minimum fall of 1:100 (0.57°) to [NZBC E2/AS1](#), 8.5.1 c.

*Check with the BCA if they have requirements in addition to the NZBC.*

#### 3.6 CONCRETE SUBSTRATE

Ensure concrete substrate has been allowed to cure for at least 28 days and has a moisture content of less than 75% RH before commencing application. Prepare surface, including vacuum cleaning and acid etching/diamond grinding as necessary to leave smooth, clean, dry and free of debris. Make good any cracks with Gripset C-Plug.

*Refer to Waterproofing Systems Ltd literature regarding the need for a plaster screed and the need for venting if the base is pumice concrete, a lightweight screed, or Woodtex.*

#### 3.7 PLYWOOD SUBSTRATE

Lay plywood square-edged sheets with staggered joints (brick bond), and laid tight-butted, with all edges fully supported. Ensure sheets are rigid, with joints flush, no lumps or hollows, smooth, clean, dry (20% maximum moisture content) and free of debris.

Plywood to be minimum 18mm, H3.2 CCA treated and conform to [AS/NZS 2269.0](#).

Sheets to be fixed with glue and 10 gauge x 50mm stainless steel screws counter sunk, chamfered external edges, fillets to internal corners, installed to Waterproofing Systems Ltd specification. Fix at 150mm centres on edges and 200mm in the body of the sheets.

Do not use LOSP treated plywood.

*Plywood substrates are best fixed with stainless steel, self-tapping, counter-sunk screws and tight butted. Specify in 4337 PLYWOOD ROOFING AND DECKING, along with a requirement to bring the substrate up to an acceptable standard for this clause. Do not use hardboard or MDF board.*

*Chamfer 30mm back from the outer edges of plywood sheets that run into gutters or rainwater heads to prevent the roof edge-to-gutter junction forming a lip and the free run of water into the gutters. T&G plywood is not recommended if sheet edges are not supported with timber nogs.*

- 3.8        **TURN DOWNS**  
Where the membrane is to be turned down at an external corner, chamfer the corner to provide a minimum 5mm radius.
- 3.9        **UPSTANDS**  
Install fillets minimum 20mm to all upstands and ensure tight and neat fit. Timber fillets H3.1 treated minimum.
- 3.10       **FLASHINGS**  
Fit membrane flashings to all internal and external corners and upstands and to all penetrations to Waterproofing Systems Ltd specifications. Neatly mould membrane up all upstands and around all roof penetrations with a tight cove.
- 3.11       **SET-OUT**  
Neatly set out rolls starting at the lowest point of the roof and run perpendicular to the roof pitch. Lay out membrane and allow to relax for 30 minutes prior to laying. In cooler conditions allow additional time for the membrane to fully relax.

**Application - laying**

- 3.12       **CONDITIONS**  
Do not lay membrane in wet or misty conditions or below 7°C. Check that the substrate is dry at time of laying. Concrete maximum moisture content 75% RH; plywood maximum moisture content 20%.
- 3.13       **APPLICATION TORCH ON MEMBRANES - GENERALLY**  
Unless otherwise specified, install reinforced modified bitumen membrane system to bituFLAME® Product Manual specification.
- 3.14       **PRIMING**  
Prime all surfaces strictly to Waterproofing Systems Ltd recommendations, ensuring good even coverage. Primed roofs will need re-priming if left more than 3 days before membrane installation.
- 3.15       **LAYING AND JOINTING**  
Lay membrane using torch applied bonding unless the location will not allow the application of heat. When cold applied under-surface adhesive may be used. Lay in order from sumps, through gutters, valleys, eaves, verges, main roof and upstands to cover flashings.
- 3.16       **HEAT CONTROL**  
Control heat to ensure the membrane is fully installed to the substrate with all laps properly formed. Ensure full bonding between the bituFLAME® base sheet and bituFLAME® cap sheet. Do not over heat membrane.  
*Over heating membrane may damage the polyester reinforcement.*
- 3.17       **LAY SELF ADHERED BASE SHEET**  
Remove peel off backing film of the bituFLAME Plura AD and apply directly onto the primer allowing 100mm side laps and 150mm end laps. Apply membrane to Waterproofing Systems installation specifications. bituFLAME Plura AD is thermo-activated when the cap sheet is fully torch welded in place.  
*Note: bituFLAME Plura AD to be used where an open flame cannot be applied to a substrate.*
- 3.18       **LAY BITUFLAME® VENTED BASE SHEET**  
Lay out the rolls of bituFLAME® VBS vented base sheet installed edge butted. Ensure rolls remain in place while the bituFLAME® BS base sheet is torched over the vented base sheet.
- 3.19       **LAY BITUFLAME® BASE SHEET**  
Fully torch the rolls of bituFLAME® BS 3mm thick directly to the primed substrate or to the vented base sheet as described in the bituFLAME® Product Manual, allowing for 100mm side laps and 150mm end laps.

- 3.20 **LAY BITUFLAME® CAP SHEET**  
Set out the bituFLAME® 4m thick mineral chip CS finish sheets to ensure laps are off-set to the base sheet. Fully torch to the base sheet to Waterproofing Systems Ltd installation instructions, ensuring the cap sheet is fully bonded to the base sheet. All side laps 100mm wide and end laps 150mm wide. All laps fully welded and seamed off.
- 3.21 **LAY BITUFLAME RE-ROOF CAP SHEET**  
Clean down existing roof membrane and remove all contamination and loose particles. Check that existing membrane is still fully bonded before application, if not, use spot mechanical fixing at 300mm centres as required. Check also that existing laps and water discharge outlets are intact and watertight, if not, make good before applying bituFLAME reroofing system.  
Before applying membrane carry out preparatory work as follows:  
- On old pour-on bitumen systems with large cracks and volcanoes identified, repair them using bitu-screed mortar.  
- On existing aluminium coated asphalt and modified bitumen membranes water blast the surface to remove loosely bonded parts of the mineral chip finishes, and remove loose chips with a leaf blower. Refix any loose membrane with mechanical fixing at 300mm centres as required.  
Directly torch bond bituFLAME Re-Roof to existing membrane allowing for 100mm side laps and 150mm end laps to Waterproofing Systems Ltd installation instructions.  
*Suitable as a re-roof cap sheet for direct overlay of existing bitumen membranes, including mineral chip finishes, pour-on bitumen and asphalt finishes.*
- 3.22 **LAY BITUFLAME VIADUCT**  
Directly torch on bituFLAME® Viaduct directly onto the bituFLAME primer allowing 100mm side laps and 150mm end laps. Apply membrane to Waterproofing Systems installation specifications.  
If concrete cracks and defects present, repair using Epoxy waterproof mortar. Lay membrane in the direction of the traffic flow.  
Lay a minimum thickness of asphalt overlay of 50mm ramped up to 60mm at any perimeter edge abutment at 90° to the bituFLAME® Viaduct lapping system and press down with a roller. If the surface is uneven or poor, apply a levelling layer in accordance with Waterproofing Systems recommendations.  
For expansion joint details refer to Waterproofing Systems for specific details.  
*Suitable for asphalt overlay for car parks, bridges and car parks.*
- 3.23 **LAY BITUFLAME ANTI-ROOT**  
Fully torch on bituFLAME® Anti-Root onto base sheet with 100mm side laps and 150mm end laps. Apply membrane to Waterproofing Systems installation specifications.  
*Suitable for planter boxes, green roofs and as a tanking cap sheet where aggressive plant and vegetation is identified risk to a tanking membrane.*
- 3.24 **INSTALL BOX GUTTERS**  
Lay membrane in box gutters with the membrane neatly dressed into Waterproofing Systems Ltd drainRite ring clamp droppers, flowRite scuppers or drainRite overflow sumps.
- 3.25 **WELD JOINTS**  
Weld joints using heat to Waterproofing Systems Ltd requirements. For bituFLAME® Granule, remove granules from the end-lap area to create bitumen to bitumen contact.
- 3.26 **PENETRATIONS**  
Form, or mould by torching, with required upstands and downturns and all penetrations to Waterproofing Systems Ltd details.
- 3.27 **INSTALL RING CLAMP DROPPER**  
Install drainRite clamp grate dropper to Waterproofing Systems Ltd installation details.
- 3.28 **INSTALL RING CLAMP OVERFLOW DROPPER**  
Install drainRite ring clamp overflow dropper to Waterproofing Systems Ltd installation details.

- 3.29 **INSTALL SCUPPER**  
Install flowRite scupper to Waterproofing Systems Ltd installation details.
- 3.30 **INSTALL OVER FLOW SUMP**  
Install drainRite overflow sump to Waterproofing Systems Ltd installation details.
- 3.31 **INSTALL ROOF VENTS**  
Install ventRite for roof space/moisture venting to Waterproofing Systems Ltd installation details.
- 3.32 **INSTALL PIPE BOOT**  
Install flashRite pipe boot to Waterproofing Systems Ltd installation details.
- 3.33 **MOVEMENT JOINTS**  
Install required movement joints to Waterproofing Systems Ltd details.

#### **Installation - accessories**

- 3.34 **INSTALL PAVER / TIMBER DECKSUPPORTS - ADJUSTABLE WITH LEVELLING HEAD**  
Install WPS ecoJack Adjustable Paver Supports with levelling head to Waterproofing Systems Ltd installation details.  
*Suitable for flat roof and trafficable decks with uneven surface or slope.*

#### **Finishing**

- 3.35 **APPLY CLEAR COATING - MINERAL CHIP MEMBRANES**  
Apply Crystal Glaze single coat system to Waterproofing Systems Ltd requirements ensuring full thickness and even coverage is achieved.  
*Used to bind mineral chips and provide an anti-lichen and moss additive.*
- 3.36 **APPLY COLOURED COATING - MINERAL CHIP MEMBRANES**  
Apply Gripset RD acrylic coating to Waterproofing Systems Ltd requirements. Apply Bondseal Primer directly onto the mineral chip finish and leave to dry, then apply Gripset RD at a rate of 1.5L/m<sup>2</sup> to Waterproofing Systems Ltd requirements, ensuring full film thickness and even coverage is achieved.
- 3.37 **APPLY BITUMINOUS ALUMINIUM COATING**  
For sand finished bituFLAME<sup>®</sup> apply Sungard bituminous aluminium coating to Waterproofing Systems Ltd requirements. Ensure that the aluminium flakes are drilled up into the bitumen liquid and are equally dispersed prior to application.
- 3.38 **FOOT TRAFFIC**  
Heavy foot traffic is not allowed on the membrane after laying.
- 3.39 **ACCESS BOARDS**  
Provide access boards for later operations and remove when no longer needed.
- 3.40 **ACCEPTANCE**
- Arrange for an inspection of the completed work.
  - Complete the applicator's Quality Control sheets and provide to them for the issuing of the Materials Warranty.
  - Protect and maintain roofing until completion of the contract works.
- 3.41 **SUBSEQUENT WORK**  
Make good any covering cut or deformed by later work. Making good to take the form of inserting a new whole or part infill sheet to maintain the appearance of the covering as originally laid.

#### **Completion**

- 3.42 **CLEAN UP**  
Clean up as the work proceeds.

- 3.43 ACCEPTANCE
- Arrange for an inspection of the completed work.
  - Complete the applicator's Quality Control sheets and provide to them for the issuing of the Materials Warranty.
  - Protect the membrane until completion of the contract works.
- 3.44 LEAVE  
Leave work to the standard required by following procedures.
- 3.45 REMOVE  
Remove debris, unused materials and elements from the site.

#### 4. SELECTIONS

For further details on selections go to [www.waterproofing.co.nz](http://www.waterproofing.co.nz).

Substitutions are not permitted to the following, unless stated otherwise.

*If substitutions are permitted modify the statement above, ensure the NO SUBSTITUTIONS clause from GENERAL is treated the same.*

*Select the options to suit the project and delete options not specified.*

#### Materials

##### 4.1 SELF ADHERED BASE SHEET

Location: ~  
 Manufacturer: Waterproofing Systems Ltd  
 Type/brand: bituFLAME®  
 Base sheet: 2.5mm bituFLAME® Plura AD  
 Cap sheet: 4mm bituFLAME® CS  
 Finish: Mineral  
 Colour: ~  
*Option*  
*Colour: Black or Green*

##### 4.2 WATERPROOFING MEMBRANE - DOUBLE LAYER

Location: ~  
 Manufacturer: Waterproofing Systems Ltd  
 Type/brand: bituFLAME®  
 Base sheet: 3mm bituFLAME® BS  
 Cap sheet: 4mm bituFLAME® CS  
 Finish: Mineral  
 Colour: ~  
*Option*  
*Colour: Black or Green*

##### 4.3 WATERPROOFING MEMBRANE - VENTED DOUBLE LAYER

Location: ~  
 Manufacturer: Waterproofing Systems Ltd  
 Type/brand: bituFLAME®  
 Vented base sheet: 0.9mm bituFLAME® VB  
 Base sheet: 3mm bituFLAME® BS  
 Cap sheet: 4mm bituFLAME® CS  
 Finish: Mineral  
 Colour: ~  
*Option*  
*Colour: Black or Green*

##### 4.4 BITUFLAME RE-ROOF CAP SHEET

Location: ~  
 Manufacturer: Waterproofing Systems Ltd  
 Type/brand: bituFLAME®  
 Base sheet: Existing membrane  
 Cap sheet: 4mm bituFLAME® Re-Roof  
 Finish: Mineral

Colour: ~  
*Option*  
Colour: *Black or Green*

4.5 BITUFLAME VIADUCT  
Location: ~  
Manufacturer: Waterproofing Systems Ltd  
Type/brand: bituFLAME®  
Substrate: Concrete or existing asphalt  
Cap sheet: 5mm bituFLAME® Viaduct  
Finish: Natural bitumen

4.6 BITUFLAME ANTI-ROOT  
Location: ~  
Manufacturer: Waterproofing Systems Ltd  
Type/brand: bituFLAME®  
Base sheet: 3mm bituFLAME® BS  
Cap sheet: 4mm bituFLAME® Anti-Root  
Finish: Natural bitumen

### Coatings

4.7 PROTECTIVE CLEAR COATING - FOR MINERAL CHIP FINISHED MEMBRANES  
Location: ~  
Supplier: Waterproofing Systems Ltd  
Type/brand: Crystal Glaze  
Substrate: Existing mineral chip finish  
Colour: Clear  
*Note: Crystal Glaze used only on bituFLAME® mineral chip finishes. Contains an anti-lichen and moss coating.*

4.8 PROTECTIVE COLOURED COATING - FOR MINERAL CHIP FINISHED MEMBRANES  
Location: ~  
Supplier: Waterproofing Systems Ltd  
Type/brand: Gripset RD  
Colour: ~  
*Option*  
Colour: *White or grey*  
*Note: For a Gripset RD finish on mineral chip prime with Bondseal.*

4.9 PROTECTIVE BITUMINOUS ALUMINIUM COATING - FOR SAND FINISHED MEMBRANES  
Location: ~  
Supplier: Waterproofing Systems Ltd  
Type/brand: Sungard aluminium paint  
Colour: Aluminium  
*A bituminous aluminium coating for sand finished bituFLAME.*

### Accessories

4.10 PAVER / TIMBER DECK SUPPORTS - ADJUSTABLE WITH LEVELLING HEAD  
Location: ~  
Supplier: Waterproofing Systems Ltd  
Brand: WPS ecoJack Adjustable Paver Supports with levelling head