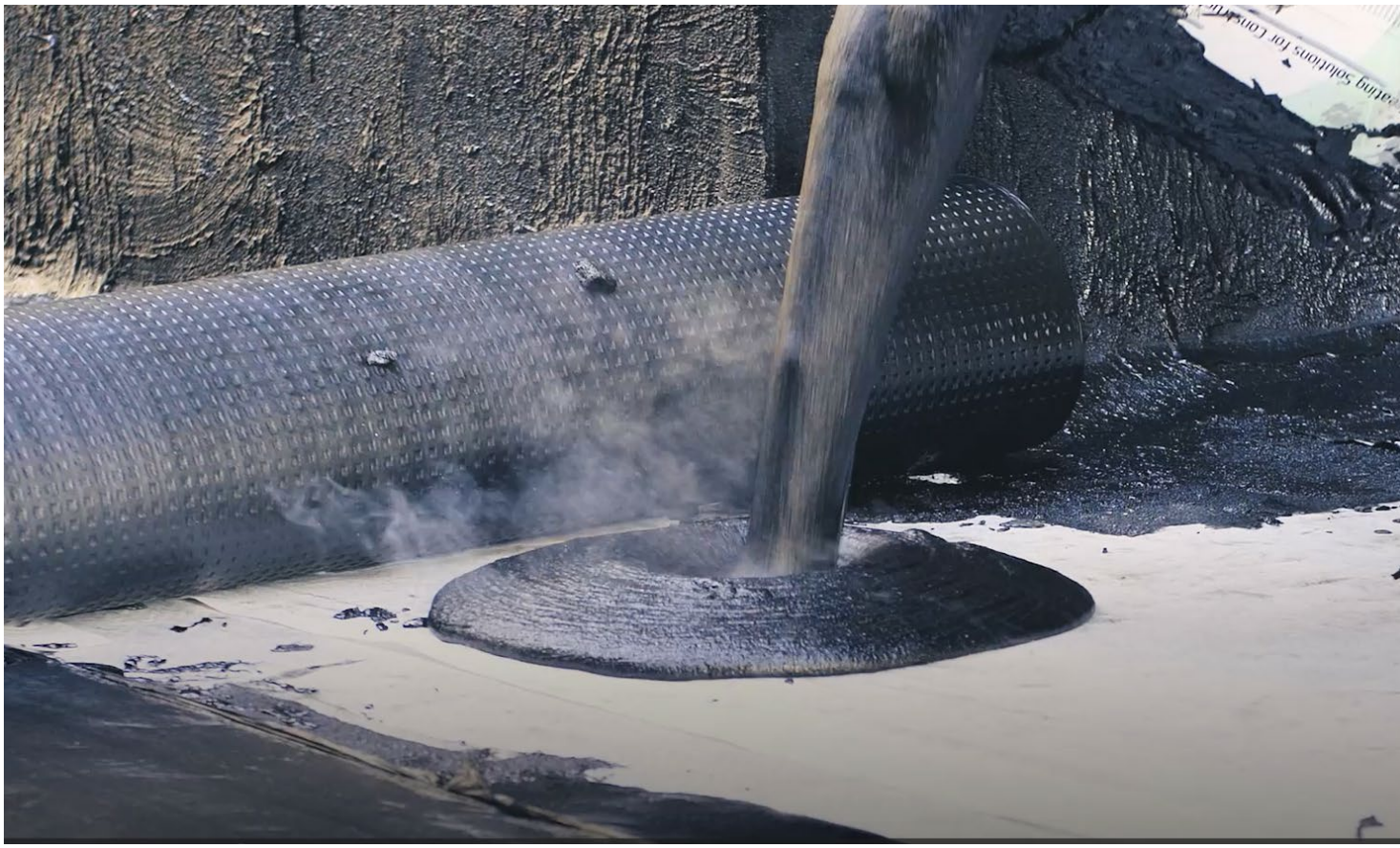
Method Statement

Ref. #: DCP00/08-0104-A-2023



AquaSure

(Hot applied rubberized asphalt waterproofing membrane)

Table of Content

Section A: General Comments

General Notes:

The information below is a detailed overview of the application of DCP's **AquaSure** hot applied waterproofing membrane and should be read in conjunction with the relevant technical data sheet prior to application. All DCP Products should be applied by experienced specialist contractors.

All the points below assume the correct preparation of the relevant surface.

Description

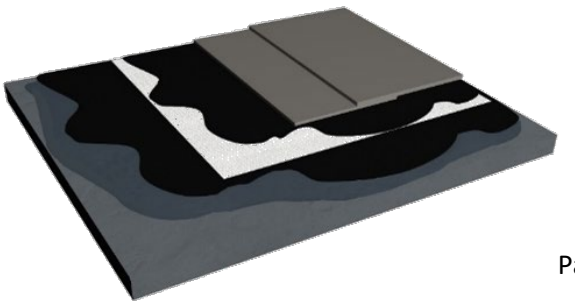
AquaSure is a hot-applied rubberised asphalt waterproofing membrane that cools down to form a flexible, strong, fully adhered, and monolithic waterproofing membrane with extremely high durability and resilience.

AquaSure comes in cardboard boxes, each one containing **AquaSure** wrapped in a layer of plastic sheet weighing 15 kg each.

AquaSure provides the perfect waterproofing membrane in applications such as roofs, parking garages, plazadecks, bridge decks, tunnels, wet areas, foundations, basement walls, green roofs and planters.

Advantages

Fully Bonded	**AquaSure** fully bonds to most substrates with extremely high adhesion strength. This property eliminates any water migration beneath the membrane, containing the water leakage and making it easier to locate the source of the leak.
Thick Finish	**AquaSure** is applied in high thicknesses compared to the 1 – 2.5 mm of other liquid-applied membranes, this high thickness enables the membrane to be applied on substrates containing little irregularities, improves its crack-bridging ability, and increases its self-healing properties
Self-Healing	**AquaSure** provides self-healing that actively repairs and restores minor punctures throughout its lifetime.
No Curing Time	**AquaSure** does not cure but just cools down in place resulting in fast setup time speeding up the job forsubsequent work.
Soil Chemical Resistance	**AquaSure** is highly resistant to fertilizers and other chemicals found in soil, enabling it to be applied underplanters and green roofs.
100% Solid Content	**AquaSure** contains no solvents, or two-part systems to mix, eliminating on-site cure failures that may occurwith other products.
Wide Service Temperature Range	**AquaSure's** excellent flexibility and adhesion properties are maintained in a where service temperaturesrange from -25°C to +70°C.



System Components

Surface Conditioner:

- **Bituproof 40S:** water-based surface conditioner for concrete substrates.

Reinforcement/ Flashing

- **DonFlash H**: a non-woven polyester fabric reinforcement placed between two layers of **AquaSure** to provide extra tensile strength and prevent cracks from affecting the membrane.
- **DonFlash V**: a fiberglass reinforcing mesh placed between two layers of **AquaSure** to provide extra tensile strength for vertical applications of **AquaSure**.
- **Sealgum**: a 4 mm thick APP modified torch applied membrane used for flashing exposed walls, parapets, drains and penetrations, expansion joints, and angle changes.

Protection/ Separation

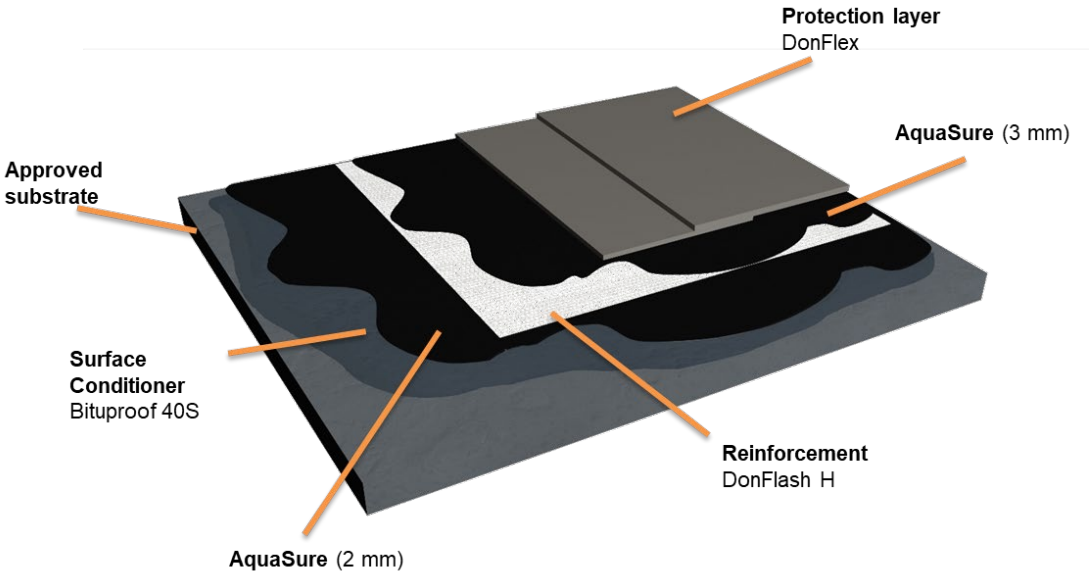
- **DonFlex**: a reinforced rubberized protection sheet, 2.0 mm thick, for protecting **AquaSure** against potential penetration or damage.
- **Plasti-board**: a polypropylene-based board, semi-flexible with high puncture resistance, designed for use as permanent protection for underground applications of **AquaSure**.
- **Geotex:** nonwoven geotextile fabric made from staple fibres that are mechanically bonded by a needle punching process to produce a dimensionally stable network that creates a separation layer between topping layers over **AquaSure**.

Drainage Membranes *(if required, when green Roofs or planter's soil is to be applied over **Aquasure** system).*

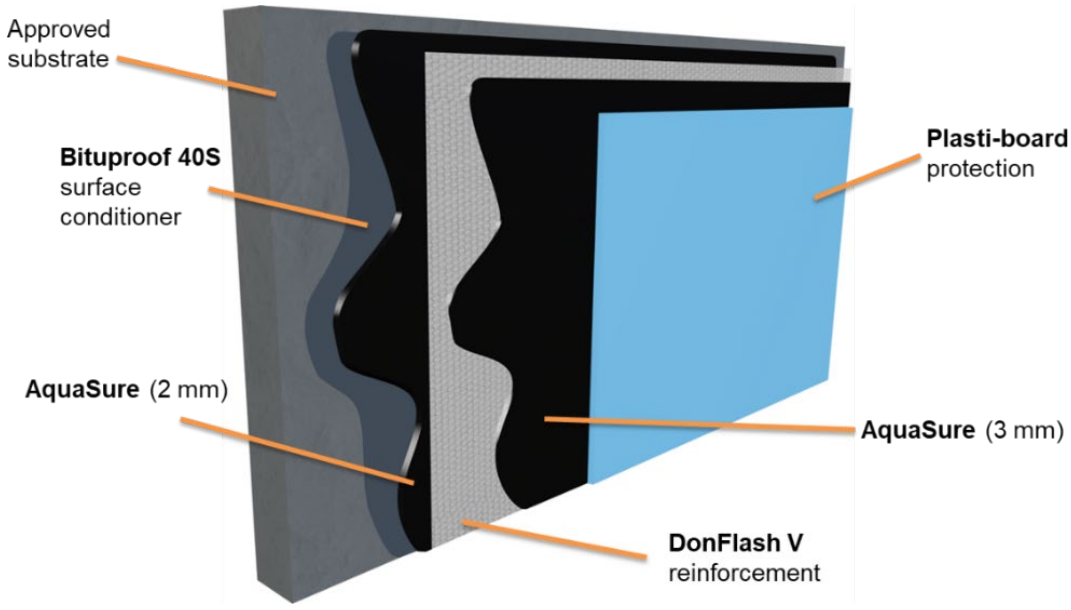
- **Don Geodrain H:** a composite drainage layer consisting of an extruded high-density polyethylene (HDPE) net drainage core with a non-woven polypropylene geotextile filter bonded to both sides.
- **Don Geodrain V**: high-strength side cuspate structure, made from HDPE to provide a light, flexible, strong, and resilient drainage membrane for different applications. **Don Geodrain V** comes in two forms, with and without geotextile lamination.

System Build-up

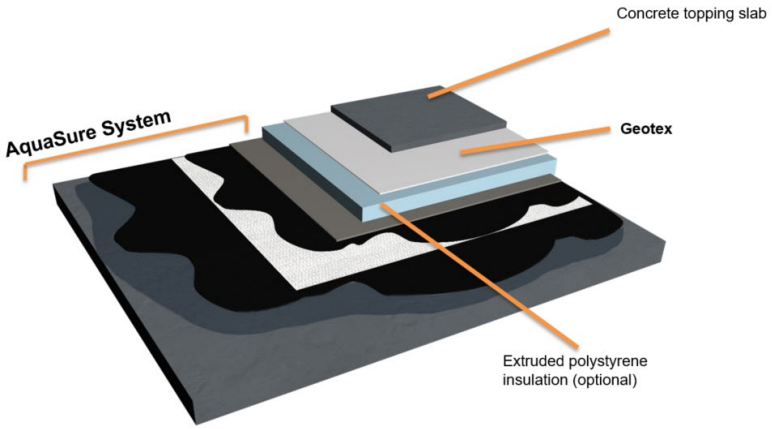
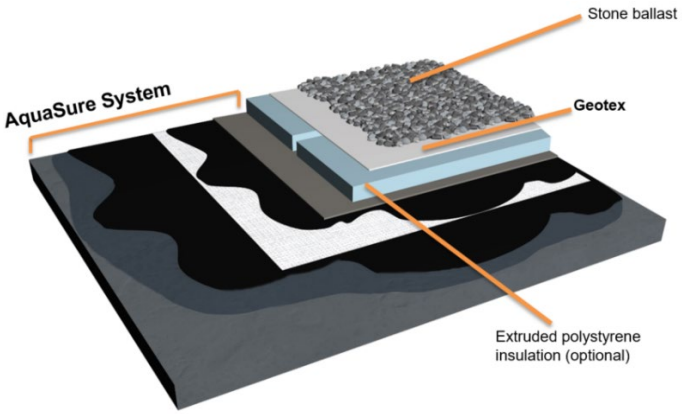
AquaSure Base System:

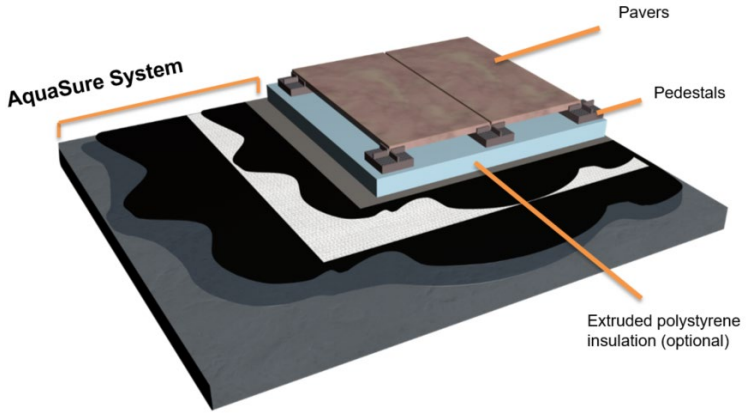
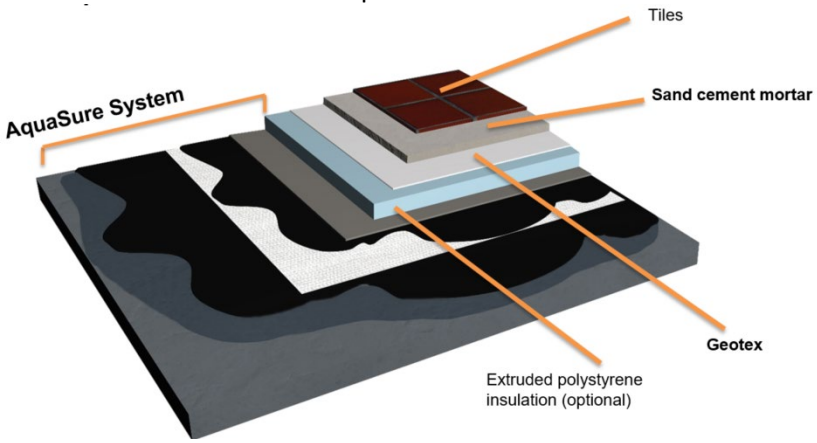
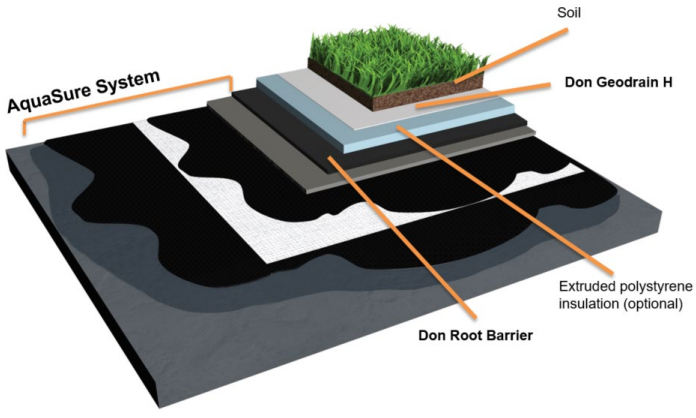


AquaSure Underground System:



AquaSure allows for a variety of subsequent layers, Horizontal applications offer a larger number of finishes to be applied over **AquaSure** System including:

Concrete Overlay Finish	While concrete topping slabs may be placed directly on top of the protection layer, it is typically recommended that a separation layer of geotextile (**Geotex**) be installed to provide additional protection from the process of placing the concrete as well as to act as a "slip plane". This should allow the topping slab to move independently of the structural slab and waterproofing avoiding the possibility of damage. The concrete topping can also be placed over extruded polystyrene insulation boards, in this case the separation layer of **Geotex** must be laid over the extruded polystyrene to prevent the concrete from being forced between the joints, displacing the boards and causing possible damage to the waterproofing membrane below. 
Gravel Overlay Finish	It is typically recommended that a separation layer of geotextile (**Geotex**) be installed to provide additional protection from the process of placing the gravel. The gravel topping can also be placed over extruded polystyrene insulation boards, in this case the separation layer of **Geotex** must be laid over the extruded polystyrene to prevent the gravel from being forced between the joints, displacing the boards and causing possible damage to the waterproofing membrane below. It is necessary to ensure complete coverage of Geotex the fabric. 

Pavers	Pavers can be placed as a topping layer in raised floor applications. Pavers are typically installed in a loose-laid open-joint assembly with a variety of pedestals. Pedestals can be installed on top of the protection layer or extruded polystyrene insulation. For application of pedestals over the insulation layer, 60 Psi extruded polystyrene is recommended. 
Tiles	For placing tiles as a topping layer, it is recommended that a separation layer of geotextile (**Geotex**) be installed to provide additional protection from the process of placing the gravel. Tiles can also be placed over extruded polystyrene insulation boards, in this case the separation layer of **Geotex** must be laid over the extruded polystyrene. For fixing tiles, a layer of sand cement mortar should be placed over **Geotex** and under the tiles. 
Planters	Green Roofs and Planter components required are typically loose laid and will be dictated by the type of green roof specified. Contact DCP for specific installation guidelines. 

Substrates

Concrete (Cast in Place)

Since there are multiple types of concrete (cast in Place) used in construction, the following should be considered for proper installation of **AquaSure**.

In general, we are looking for a concrete substrate that has a minimum compressive strength of 17 MPa with a density of no less than 1400 Kg/m^3, please check the below table:

Table 2:

Type of concrete	Density	Suitability	Waiting time after casting and before AquaSure application
Structural weight concrete	2100 - 2600 kg/m^3	Acceptable	14 days minimum
Lightweight Structural Concrete	1440 - 1840 Kg/m^3	Acceptable	28 days minimum
Lightweight insulating/cellular concrete	240 - 1440 Kg/m^3	Unacceptable	-

Concrete Curing Compounds

Table 3:

Type of curing compound used	Suitability
Sodium Silicate	Acceptable, because they leave no film or residue when properly applied.
Resin Based	Acceptable, only if the film is removed by brushing down the surface with a wire brush.
Wax Based	Unacceptable
Acrylic Based	Unacceptable

Forecast Concrete

Precast concrete is typically made of structural weight concrete and is generally an excellent substrate for the application of **AquaSure**. Filling and/or reinforcing the joints between individual precast panels is typically required.

Concrete Masonry Units

Concrete masonry units (CMU) used in foundation walls, planter walls, parapets, etc., are an acceptable substrate for **AquaSure.**

Gypsum Board Over Metal Decking

An acceptable substrate for **AquaSure**. Gypsum board must be fire-rated type X board, minimum (16 mm) thickness. Both traditional paper-faced and newer fiberglass-faced products with treated cores are acceptable.

The board must be mechanically fastened to a minimum of 22 gauge metal decking with appropriate screw-type fasteners as directed by project specifications or local building codes. At a minimum, there should be 1 fastener per 2 square feet of board (4'X8' board would have 16 fasteners). Adequate structural support is required to limit deflection and movement.

Metal

An acceptable substrate (flat metal sections, not ribbed decking) for **AquaSure**. Metal must be free of oil, rust, paint, or coatings which may inhibit the bond of the membrane.

Tools and Equipment:

It is suggested that the following list of equipment are adopted as a minimum requirement

Personal protection	:	*Protective overalls*
	:	*Goggles or a face mask*
	:	*Good quality gloves*
	:	*Safety shoes*
	:	*Safety helmet*

Equipment	:	*Broom and shovel (Fig.1)*
	:	*Metal Bucket (Fig.2)*
	:	*Rubber squeegee (Fig.3)*
	:	*Hand-held sprayer, brush or roller (Fig. 4)* *(for application of surface conditioner)*
	:	*Brushes or trowels (Fig. 5)*
	:	*Dip thermometer (Fig. 6)* *(for checking membrane temperature)*
	:	*Back-pack blower or air compressor (Fig. 7)* *(for blowing clean the deck)*
	:	*Double-jacketed melter with a thermostat gauge. (Fig. 8)* *The melter must be capable of maintaining temperatures ranging from 175°C to 200°C.*
	:	*Thickness gauge (Fig. 9)*
	:	*Gas Torch (Fig. 10)*
	:	*Utility knife (Fig. 11)*
	:	*Screwdrivers, hammer, pliers, wrenches (Fig. 12)*

Fig.1: Broom and shovel

Fig.2: Metal Bucket

Fig.3: Rubber squeegee

Fig.4: Hand-held sprayer, brush or roller

Fig.5: Brushes or trowels

Fig.6: Dip thermometer

Fig.7: Back-pack blower or air compressor

Fig.8: Double-jacketed melter with a thermostat gauge

Fig.9: Thickness gauge

Fig.10: hot-air welding machine, seam rollers

Fig.11: utility knife

Fig.12: Screwdrivers, hammer, pliers, wrenches

Section B: Application

1.0 Ambient Condition

AquaSure can be installed in a wide temperature range. Application below -15°C is not recommended to ensure the proper operation of workers and mechanical equipment. The substrates on which **AquaSure** will be applied should be dry. If it begins to rain or snow while applying **AquaSure**, the application process must not proceed. Allow at least one full day for the membrane to dry after such weather conditions before the application of the membrane continues. However, **AquaSure** is not affected by rain, snow, or frost immediately after application.

2.0 Substrate Preparation

2.1 Surface preparation is very important to get the highest performance of **Aquasure**.

2.2 Concrete substrates must have a minimum compressive strength of 17 MPa and a density of no less than 1440 kg/m^3.

2.3 New concrete should be 14 days old minimum, however, it is recommended to be at least 28 days cured (max moisture content of 4%). *(refer to Table 2)*

2.4 Depending on conditions (i.e., ambient temperature, humidity) the concrete may be dry enough to receive application of the membrane in less than the 14 days minimum recommendation. Contact DCP's Technical Department for additional information.

2.5 All concrete surfaces must be clean, dry, and free from any laitance, wax, grease, dirt, oil, and standing water.

2.6 In addition, the concrete surface must be free from any surface contaminates or cleaning residue that may harmfully affect the adhesion of the membrane such as unapproved curing compounds, old coatings, or surface treatments.

2.7 Etched substrate should be leveled and free from contamination such as mortar and paint splashes, or curing compounds.

2.8 Excess laitance is best removed by mechanical grinding, light sand/grit blasting followed by vacuum cleaning to remove dust debris. All preparation equipment should be of a type approved by DCP.

2.9 Surfaces contaminated with oil or grease should be cleaned using a chemical degreaser or a suitable cleaning method that assures the surface is free from any oil traces. Consult our technical department to advise on the suitable method for removing the contamination.

2.10 All surfaces to be waterproofed and flashed must be closely inspected by the applicator before starting with the application of **AquaSure**.

2.11 A poured-in-place concrete surface (horizontal) should be finished with a rough texture to provide a mechanical bond for the membrane. The texture, however, should not be so rough that the membrane cannot be applied at a continuous thickness across the surface.

2.12 As a minimum, a broom finish or equivalent, similar to Concrete Surface Profile (CSP) scale 3 to 5 is required. A steel-troweled finish is NOT desirable.

CSP 3
(light shotblast)

CSP 4
(light scarification)

CSP 5
(medium shotblast)

2.13 Surface irregularities that may affect the continuity of the membrane should be treated and all found deficiencies should be reported so they can be treated prior to the application of **AquaSure**.

2.14 Structurally unsound and friable concrete, surface defects and imperfections such as voids and deep cracks should be repaired with a suitable cementitious mortar before application.
Consult the DCP's Technical Department for specific recommendations.

2.15 Excessive moisture within the concrete can be drawn to the surface during application by the heat of the membrane and even after application by the heat of the sun on the black membrane or by the vapor drive caused by the capillary action of the water wanting to escape.

2.16 The result of excessive moisture on **Aquasure** would be seen in the form of pin holing, blistering and/or loss of adhesion.

2.17 Several test patches should be applied to different areas of the prepared substrate. The patches should be no less than 30 cm^2 and be applied at no less than 3.2mm thick. The bond to the substrate can be checked immediately after the membrane cools and then should be checked again the next day.

3.0 Priming/Conditioning

3.1 Apply **Bituproof 40S** surface conditioner at a rate of 5.0 m^2/ltr.

3.2 Leave the surface conditioner to dry.

3.3 Do not leave the surface conditioner exposed for long periods of time.

3.4 Wood, plywood, metal or gypsum board substrates do not need to be conditioned.

4.0 Melting/Mixing

4.1 Prior to the application of **AquaSure** on the approved substrate, the product must first be melted, heated and mixed properly to develop its full physical properties.

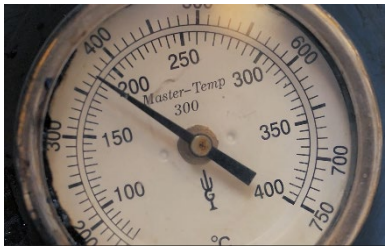
4.2 Indirect heat in the melting process of **AquaSure** should be used due to the high rubber content of the product. Thus a double-jacketed melter should be used.

4.3 Check with the melter manufacturer for instructions covering the melters proper operating procedures, safety and maintenance before firing it up.

4.4 Melt **AquaSure** in a double-jacketed melter at a temperature between 175°C and 200°C while mixing continuously.

4.5 **AquaSure** should be agitated using a mechanical agitator to keep the melted material moving, ensuring a uniform transfer of heat throughout the membrane.

Notes:



- ***AquaSure** should not be continuously heated and agitated for more than 6 hours without the addition of fresh material.*
- *The safe melting temperature for **AquaSure** ranges from 175°C to 200°C. Temperatures of above 200°C must not be imposed on the material.*

5.0 Application [Horizontal]

5.1 Apply the first coat of **AquaSure** at 2.0 mm thickness, at a coverage of approximately 1.15 kg/m^2 per mm layer thickness to obtain a continuous uniform coating.

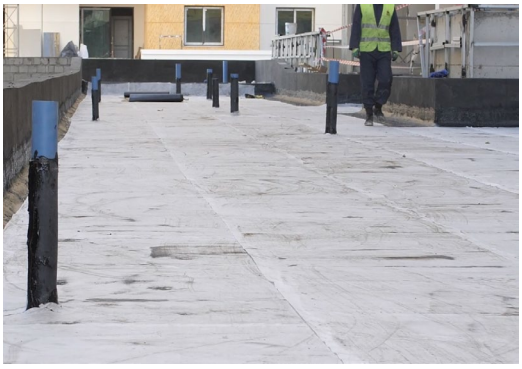
5.2 **AquaSure** should be spread once poured onto the substrate using a rubber-bladed squeegee. A reinforced, rubber blade, 0.6 cm thick x 4.0 cm deep x 45 - 60 cm wide, is recommended. A notched blade is not acceptable.

5.3 While applying the membrane, a roll of reinforcing fabric should be prepared and properly aligned in order to be rolled out immediately embedding it into the warm membrane.

5.4 Immediately after the application of the first layer, apply the fabric-reinforcing sheet **DonFlash H** by firmly embedding it into the hot layer of **AquaSure**. It is important that the fabric is applied while the membrane is still warm in order to ensure full contact.

5.5 The fabric should be broomed into the membrane to eliminate any wrinkles, as there should be no air pockets, folds, or wrinkles present in the fabric.

5.6 Once the row of reinforcing fabric has been installed, another row can be rolled out overlapping the previously applied one by 75 mm.



5.7 Apply the second coat of **AquaSure** at a thickness of 3.0 mm to fully encapsulate the system at a coverage of approximately 1.15 kg/m^2 per mm layer thickness to obtain a continuous uniform coating.

5.8 An evenly distributed 5.7 kg of **Aquasure** per meter square (total consumption per two layers) will ensure proper coverage. However, the exact coverage may vary depending on the roughness of the substrate, the temperature of the membrane, and the ambient temperature.

5.9 In order to finally check the applied thickness, the applicator should use a thickness gauge and spot-check the covered area, as it is the applicator's responsibility to provide and confirm the specified thickness.

5.10 Additional material is simply applied over the existing material if the membrane is found to be thin in any area, since **AquaSure** is a thermoplastic product, any traces of old material will re-melt and fuse with the new coat to form a monolithic membrane.

6.0 Application [Vertical]

6.1 Mainly two methods are commonly used to apply **AquaSure** on vertical surfaces such as foundation, basement, and tunnel walls.

6.1.1 Trowel Method:

- Using a wood or metal hand trowel, the membrane is brought up to the vertical surface.
- It is usually easiest to use an arc motion up the surface of the wall.
- Typically, the membrane can be brought up to shoulder height without much difficulty.

6.1.2 Roller Method:

- Using a large nap roller mop (paint rollers will not work), mounted on the end of a pole, the membrane can be rolled onto the vertical surface from a large pail, "wash tub" or trough.
- In order to achieve the minimum thickness required, it will typically be necessary to apply the membrane in more than 1 coat. Each coat should be applied in different directions to ensure complete coverage of the surface is attained.

Note: Heat-resistant brush may also be used for flashing vertical parapets.

6.2 In vertical applications, **AquaSure** membrane should be applied in two layers with a layer of reinforcing fiberglass fabric **Donflash V** (or **DonFlash H** alternatively) between coats of the membrane.

6.3 The initial coat of **AquaSure** membrane is to be applied by trowel or roller at an average thickness of 2.0 mm, at a coverage of approximately 1.15 kg/m^2 per mm layer thickness to obtain a continuous uniform coating

6.4 Once the specified thickness has been attained, immediately install the reinforcing fabric.

6.5 The fabric may be installed horizontally or vertically, although installing it horizontally typically proves to be easier.

6.6 Once a row of reinforcing fabric has been installed, another row can be rolled out overlapping the previously applied one by 75 mm.

6.7 The second coat of **AquaSure** should be at a thickness of 3.0 mm at a coverage of approximately 1.15 kg/m^2 per mm layer thickness to obtain a continuous uniform coating.

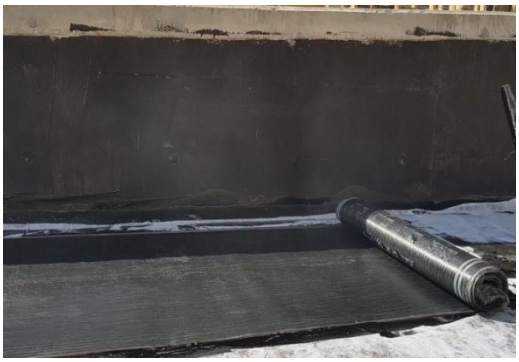
7.0 Protection Layer Installtion

Protection layer is required to be placed over the membrane for all sorts of applications to protect it from backfilling operations, exposure to weathering, installation of topping material, pedestrian traffic, etc.

7.1 Protection of Horizontal Applications:

7.1.1 For horizontal applications (roofs, plazas, planters, decks, etc.), **AquaSure** should be protected using **DonFlex**, 2.0 mm thick rubberized sheets reinforced with fibres, overlapping adjoining edges by 60 mm.

7.1.2 The protection layer should be embedded into the membrane while the membrane is still warm to ensure that a good bond between them is achieved.



7.2 Protection of Vertical Applications:

7.2.1 For vertical applications (retaining walls, foundations, tunnels, basements, etc.), it is recommended to use a light weight protection layer in order to prevent it from pulling itself off the vertical membrane and cause the membrane to split.

7.2.2 In order to ensure that, the following protection layers are recommended:

- DCP's **Plasti-board** (2.0 – 5.0 mm thickness); which is a polypropylene based board, semi-flexible with high puncture resistance.
- Extruded or expanded polystyrene insulating boards.

Note: It is strongly advised that the application of the membrane commences as late in the construction stage as possible to minimize damage to the membrane installation from other trades and operations.

8.0 Detailing

For installing **AquaSure** in waterproofing applications, DCP has developed guidelines for common detailing conditions. For other detailing conditions that cannot be handled by these standard guidelines, DCP's Technical Department should be contacted.

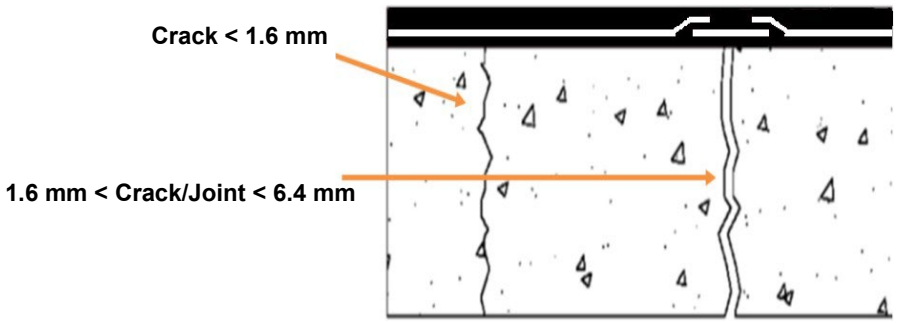
Common Detailing Conditions

8.1 Cracks, Construction, or Control Joints:

8.1.1 For cracks less than 1.6 mm in width
No special detailing is required.

8.1.2 For joints/cracks over 1.6 mm but less than 6.4 mm in width

- Apply **AquaSure** at a thickness of 3.0 mm over the joint/crack area.
- After applying the first coat, install a 150 mm wide **DonFlash H** reinforcing polyester fabric strip embedded into the warm membrane.
- Then, apply another layer of **AquaSure** at a thickness of 3.0 mm, over the reinforcing sheet.



8.2 Joints Between Precast Elements

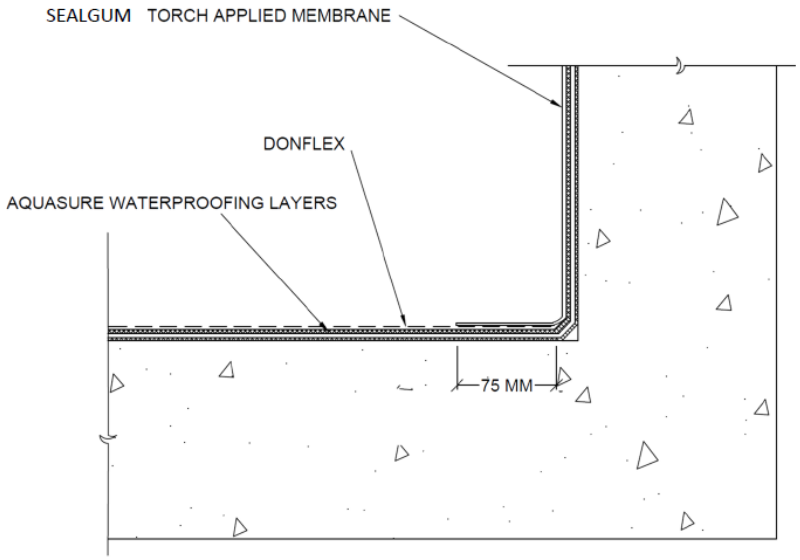
- The joint should be filled with concrete or acceptable repair mortar.
- Apply **AquaSure** at a thickness of 3.0 mm over the joint area then install a 150 mm wide reinforcing polyester fabric strip embedded into the warm membrane.
- Apply another layer of **AquaSure** at a thickness of 3.0 mm to encapsulate the system.

8.3 Exposed Flashings (Walls, Parapets, Kerbs etc.)

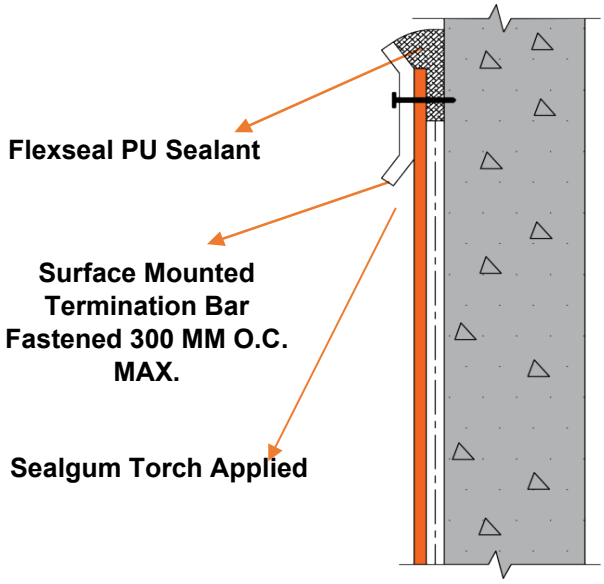
For all exposed flashings, the below methods should be used since **AquaSure** should never be left exposed.

8.3.1 Using **Sealgum Torch** Applied Membrane

- **Sealgum** is extended 75 mm from the deck up to a minimum of 200 mm on the wall, parapet, above the finished surface of the roof.
- Before applying **Sealgum**, **AquaSure** should be flashed vertically from the horizontal surface up 150 mm of the wall/parapet.
- Sealgum should then be applied over the horizontal application and brought up the wall/parapet.



8.3.2 Termination of **Sealgum Torch** Applied Membrane



9.0 Testing

9.1 After the application of **AquaSure**, it is recommended to test for any water leakage by flooding the substrate with 50 mm head of water and leaving it for 48 hours.

9.2 Testing can be conducted 24 hours after the application of the full **AquaSure** System.

9.3 Note any detected leakage and repair it.

9.4 Re-test the full area.

9.5 Water sprinklers can be used in vertical or highly sloped areas.

9.6 Alternatively, an electronic leak detector can be used to pin point any failure in the applied system.

10.0 Repairing of Damaged AquaSure

10.1 Any detected failure should be repaired following these steps:

10.1.1 Damaged areas should be marked and flagged.

10.1.2 Remove the protection layer.

10.1.3 Using a torch, heat the applied membrane and remove the defected area around it.

10.1.4 Remove any new or old contamination.

10.1.5 Reapply a heated coat of **AquaSure** as per the recommended coverage.

10.1.6 Protect the newly applied membrane with a protection layer as per the recommended products and procedures explained earlier in this presentation.

*Note: Since **AquaSure** is a thermoplastic product, any traces of old material will re-melt and fuse with the new coat to form a monolithic membrane.*

11.0 Limitation

11.1 Do not apply **Aquasure** to concrete of density less than 1440 kg/m^3, to "green" or uncured concrete surfaces, concrete holding enough moisture to cause blistering or pinholing of the membrane.

11.2 Do not apply **Aquasure** over concrete curing compounds, form release agents or surface coatings that are not approved by DCP.

11.3 Do not apply **Aquasure** Over smooth, steel-troweled concrete surfaces.

11.4 Do not apply **Aquasure** If the membrane has been overheated – beyond 200°C.

11.5 Unacceptable adhesion is indicated by the presence of moisture/dampness on the concrete or underside of the membrane; membrane that is completely loose from the surface with no force exerted to remove it; any amount of concrete dust or debris pulled up with the membrane. Any of these indicators will require additional drying or preparation of the concrete substrate.

12.0 Cleaning

12.1 All tools and equipment used for **Aquasure** application must be cleaned immediately after finishing using xylen, acetone or other suitable solvents..

12.2 Hardened materials must be cleaned using DCP Solvent mechanically.

Section C: Cautions

Health and safety

Avoid inhalation of vapours and ensure adequate ventilation. Avoid contact with skin and eyes. Gloves should be worn and the use of barrier cream is highly recommended

Safety Around Melter

Check with the manufacturer of the melter for instructions regarding the melter's correct operating procedures, safety and maintenance before firing it up. Proper clothing is essential when working around or near a melter.

A fire extinguisher should be within easy reach of the melter.

Skin Burns Treatment

Rinse the burn area with plenty of water to cool it, without using ice.

Do not attempt to remove membrane or burnt clothing from the burn area.

Rush burn victim to a doctor immediately for first aid treatment.

Fire:

Ensure adequate ventilation. Do not use near a naked flame and do not smoke during use.

A fire extinguisher should be within easy reach of the melter.

For further information on refer to the Material Safety Data Sheet.

Section D: Approval and Variations

This method statement is offered by DCP as a 'standard proposal' for the application of **AquaSure**. It remains the responsibility of the Engineer to determine the correct method for any given application. Where alternative methods are to be used, these must be submitted to DCP for approval, in writing, prior to commencement of any work. DCP will not accept responsibility or liability for variations to the above method statement under any other condition.