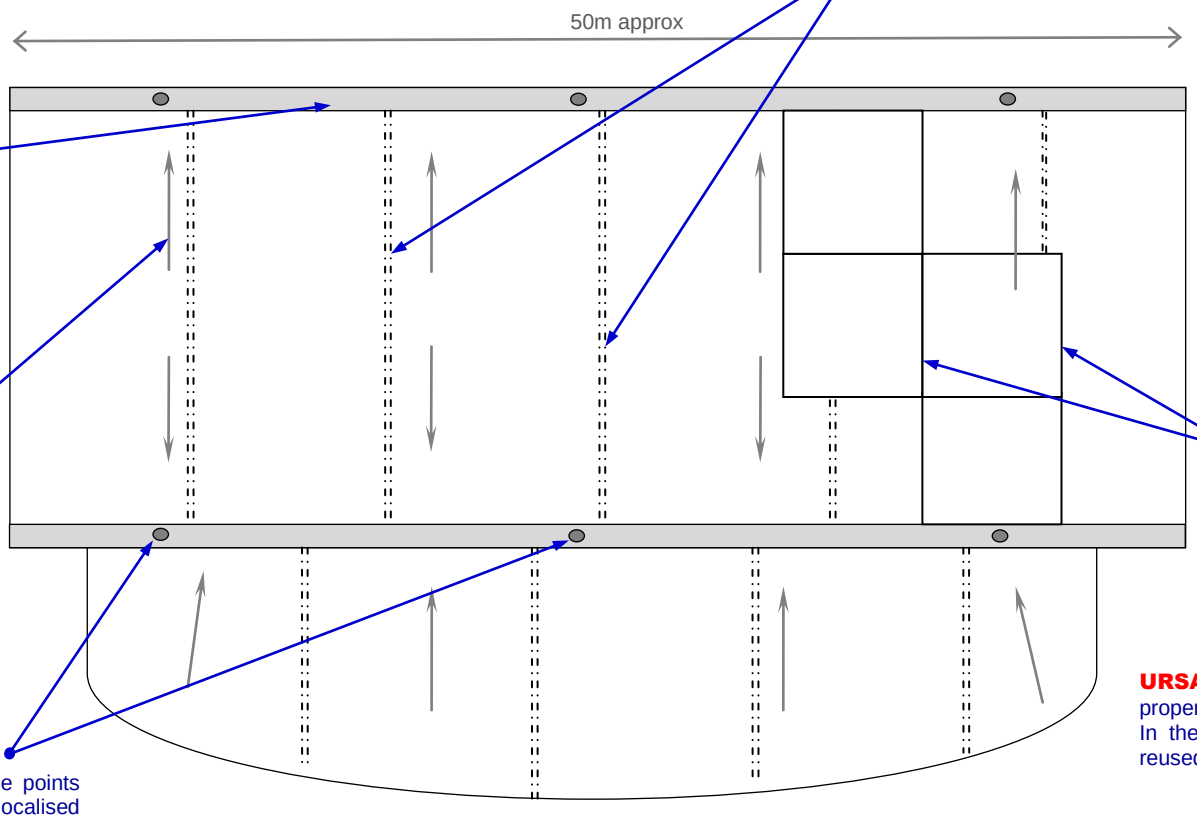
Mudahjuta Industries Sdn Bhd 147668-U
We Advance with Integrity

New Improved URSA* HL* or NW* Application Details

Schematics Only – Not to Scale

11.07.2017

Plan View



Vapour Release Points every 6m~8m approximately depending upon porosity of finished layer. Vapour outlets are normally discharged into the perimeter scupper drain. These become necessary for larger roof spans.

More information on Internal system of vapour release in a self draining system – see section attached

Perimeter Scupper to be adequately sized to ensure that the highest point in the scupper does not exceed the concrete trough or the Vapour Release Points.

Minimum gradient of fall normally prescribed by project consultants is 1 in 200.

Expansion Joints to stop creeping of shrinkage cracks are recommended at no larger than 6m x 6m bays or as directed by the project consultants. These are surface cuts that are approximately 6mm (W) x 10mm (D) that are usually filled with a UV resistant sealant

URSA HR-L has negligible water absorption properties that are essential to dimension stability. In the event of re-roofing, all Ursa XPS may be reused.

Ensure adequate discharge points are available to cater for localised storm bursts and prevent flash flooding on roof

NB:
Many Waterproofing Specialists have a wealth of experience working with Ursa Extruded Polystyrene XPS rigid insulation and may choose to adopt their own installation procedures to comply with their own manufacturer's warranty.

URSA*, the Trademark of the Uralita Group, is an EXTRUDED polystyrene (abbreviated to XPS) has been designed with superior technical properties specifically for Building Applications. All URSA products have been manufactured in strict compliance with EURO standards and all URSA XPS products have been treated with approved flame retardants to meet BS EN16134. Please call us on +603 22841019 or email to pauline@misb.com.my for verification

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Discussion Notes for Architects & Designers

Construction methods and equipment accessibility have been steadily improved over the years. Differing material rates, more choices in materials and evolving construction methods have given more options to better adapt the current systems.

These proposed countermeasures were formulated from ongoing projects to cater for the common problems found on site:

a. Surface Cracking of Mortar Screed Layers

Generally, mortar screed ends with cracking with or without insulation. Works Contractors have found it difficult to control surface cracking due to transpiration at the mortar screed on concrete surface when exposed to intense afternoon heat.

Attempts were made to cover the screed with plastic sheets or a layer of curing- film was sprayed over, but this protective method was more effective with concrete than with mortar screed.

Here are some suggestions to reduce or avoid this problem from manifesting into serious cracks.

- Always insert expansion joints at the recommended 3m centres or as specified by project consultants as roof spans and designs differ from project to project.
- Consider the use of Chipping Concrete instead of Mortar Screed. The stone chips will help dissipate and reflect the heat.
- Use Concrete Grade C25 instead of Mortar Screed with a power float and rendered finish to fall. At today's material rates, a low to medium grade of concrete is cheaper than a 1 in 4 mortar mix.

URSA NW and HR series have very high compressive strengths that can cater for a concrete slab including standard impose loading designs. Similarly, the compressive strengths and negligible water absorptions allow the insulation foam to remain rigid throughout its life span.

b. Preparation of Concrete Slab to Receive System

It is recommended that the concrete substrate itself be power floated to fall. Most contractors carry the convenience of motorised screed machines that can power float finish at economic costs.

- An untreated concrete slab pour leaves a rough undulating surface and potential ponding spots. Patching these does not resolve the undulation and misdirection of water that seeps through the roof system.
- Honeycomb formations are detrimental to waterproofing performance as the surface may give way prematurely puncturing the finished membrane. These also form weakness where vapour pressures may use to penetrate.
- A smooth power floated surface allows membranes to be applied and finished more efficiently.
- If the concrete is provided with a gradual gradient to fall towards scupper drains and/or discharge centres, then any water that has entered the roof build up over time will also be allowed to be dispense off without adversely affecting adjacent works.

d. Releasing Vapour Pressures

Concrete is a porous material. Mortar Screed is even more porous.
Therefore, moisture will seep through with or without surface cracks. Moisture built up within the system gives rise to vapour pressures particularly during the intense afternoon heat. When this happens, Vapour Releases must be configured into the system to maintain the stability of the whole roofing system with a waterproofing membrane.

e. Concrete Scupper Drain

Ensure that a concrete scupper drain is cast in with adequate width and depth. This must be constructed together with the concrete slab. If this is omitted within the design, there is little that can be done to remedy this as an afterthought.

Specialists have reported the following omissions in many projects

- Scupper drains were not provided on flat roofs and were subsequently formed using the thickness of the Waterproofing and Insulation Build up. This induces rain back flow into the Roof Build up causing subsequent system uplift. In severe cases, buckling of your masonary layer will occur.
- Inadequate depth of scupper drains was another commonly reported site problem. Scupper drains normally require an additional layer of screed to form a directional fall towards a discharge point. Most project consultants look for a minimum gradient of 1 in 200. If the concrete scupper depth is insufficient, the screed thickness at the highest point will be the same level or higher than the scupper depth. When this happens, back flow into the system will occur. At the highest point, the concrete scupper must still have sufficient depth to hold rainwater within its structure.
- If Vapour Release pipes are introduced at the edge of the scupper, ensure that the water level within the scupper does not reach these pipes to avoid system back flow.

f. Rainwater Downpipes

Rain water discharge was quite often underestimated during a tropical storm burst. Meteorological station often advise 300mm/hr rain precipitation load and at certain locations 400mm/hr rain fall.

Failure to provide adequate drainage would give rise to a flash flood scenario giving rise to a "swimming pool effect" adding unpredictable structural loading and deflections to the roof. Roof system uplift will also be inevitable with repercussions.

g. Concrete Permeability

More and more contractors are making use of chemical additives within the concrete slab to lower the permeability of the concrete. This adds a relatively inexpensive secondary defence against roof leaks. Some ready mix suppliers provides this as a standard option.

h. U Value & Thermal Guide

MS 1525:2007 recommends < 0.6 W/m2K for Concrete Flat Roofs (Heavy Roofs)

- 50mm URSA HR-L U value < 0.58 W/m2K
- 80mm URSA HR-L U value < 0.36 W/m2K
- 100mm URSA HR-L U value < 0.29 W/m2K

Thermal & Condensation Risk Analysis is available upon request for all URSA systems.

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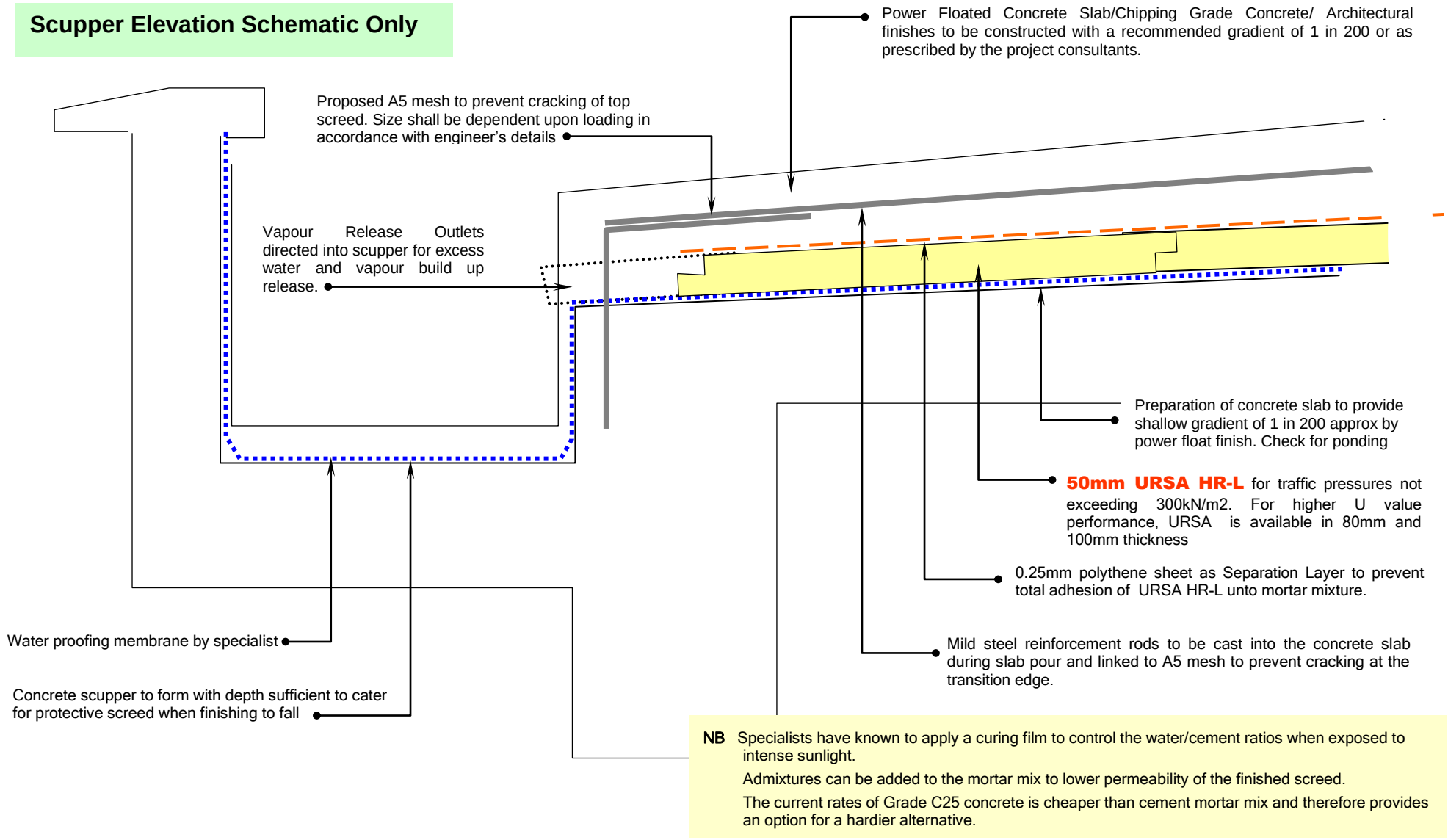
Scupper Elevation Schematic Only



NB Specialists have known to apply a curing film to control the water/cement ratios when exposed to intense sunlight.

Admixtures can be added to the mortar mix to lower permeability of the finished screed.

The current rates of Grade C25 concrete is cheaper than cement mortar mix and therefore provides an option for a hardier alternative.

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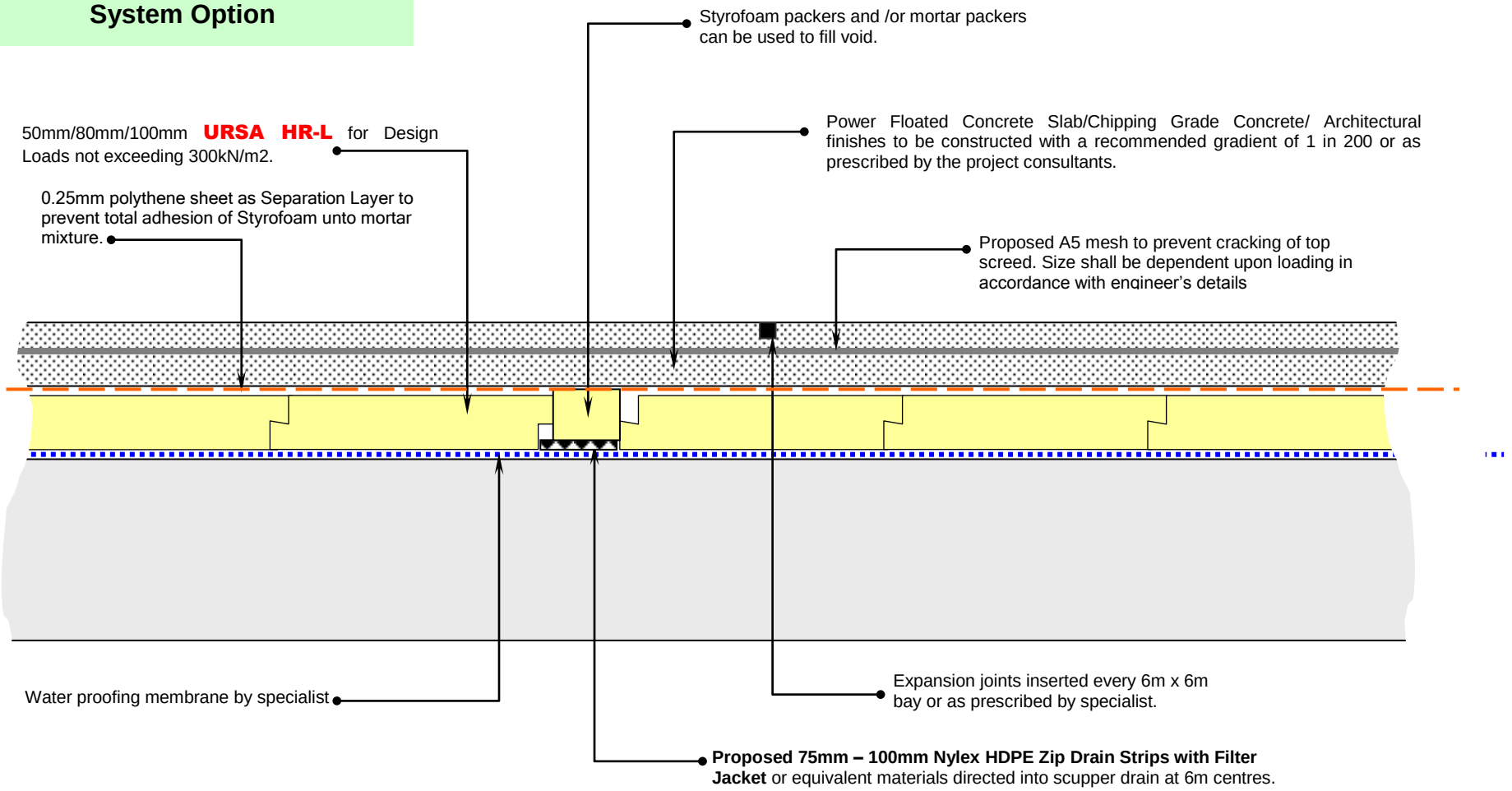
Vapour Released and Drainage System Option



NB Waterproofing Specialists are known to have their own in house solutions as Vapour Release System. The above shows an indicative concept used on existing projects. Brand names stated are used for their technical data and strength performances. Other alternatives are readily available.