SPECIFICATION
FOR
FLAT ROOF WATERPROOFING

Bahagian Forensik (Struktur dan Jambatan)
Cawangan Kejuruteraan Awam, Struktur dan Jambatan
Ibu Pejabat JKR Malaysia
Kuala Lumpur

Contents **Page**

SPECIFICATION FOR FLAT ROOF WATERPROOFING

1. General

1.1. Scope

The existing waterproofing screed and/or membrane that has exceeded its service life shall be replaced as instructed by the S.O. The repair shall include inter-alia:

i. Removal of all existing waterproofing system and/or screed till the concrete slab.

ii. Clean and preparation of the concrete surface.

iii. Laying of screeds to fall.

iv. Laying of a new waterproof system including all relevant details at movement joints, turns at upstands and flashing.

1.2. General Requirements

i. The areas where waterproofing shall be replaced are as instructed by the S.O.

ii. All materials broken out shall be removed and carted away from site by the Contractor at his own expense.

1.3. Storage And Handling

i. Materials shall remain in their original sealed containers or packages until the time of use and shall be stored in strict accordance with the manufacturer's specification.

ii. Each consignment of materials shall be accompanied by a manufacturer's certificate of date of manufacture. Materials stored beyond the manufacturer's recommended shelf life shall not be used.

1.4. Submissions

1.4.1. Submissions - Waterproofing Screed

Prior to the commencement of the work, the Contractor shall submit details of the proposed removal and replacement methods for the approval of the S.O. including:

i. Waterproofing screed removal technique.

ii. Surface preparation technique.

iii. Materials and mixing preparations.

iv. Bonding agent between screed and concrete substrate.

v. Materials manufacturers, quarry, sand source, etc.

vi. Application methods.

vii. Curing technique.

1.4.2. Submissions - Waterproofing Materials

The Contractor shall submit for the S.O.'s approval:

i. Name and generic type of the proposed material and associated primer for concrete.

ii. Name and address of supplier and manufacturer of the material and associated primer.

iii. Product data sheets showing compliance with the specification requirements as stated below. The S.O. will require documentation from an approved independent testing authority to confirm the performance criteria stated on product data sheets.

iv. Detailed proposal of application techniques to be used including standard details for upstands, gulleys, pipe protrusions, etc and all relevant requirement.

1.4.3. Submissions - Treatment Methods For Joints

The concrete surface shall be structurally sound and free from cracks, deterioration and honeycombs. All cracks and honeycombs shall be repaired by epoxy injection and repair mortar respectively.

The Contractor shall submit details of the material for the S.O.'s approval including:

i. Name, generic type and suppliers.

ii. Manufacturer's data showing compliance with the requirements of this specification.

iii. Details of proposed application techniques.

1.4.4. Testing Of Final Surface

The Contractor shall submit testing protection in compliance with the specification requirements as per section 3.4.

2. Materials

2.1. Waterproofing

i.	Type :	- Liquid applied polyurethane based waterproofing coating or equivalent, - Bituminous based torch on waterproofing membrane or equivalent.
ii.	Cured Form :	Waterproof Tough durable elastomeric membrane Allows substrate movement
iii.	Properties :	Can withstand high temperature Resistant to fungal attack Does not brittle when ageing or exposure to sunlight

2.2. Bedding Screed

The bedding screed shall be cement : sand mixed in the ratio of 1:3. The bedding screed shall be laid to a fall of 1:100 to either side of each building element with a minimum thickness of 25 mm and to a wood float finish.

3. Workmanship

3.1. Existing Waterproofing Screed Removal And Preparation

i. The existing screed shall be removed using light electrical breaking tools. Heavy compressed air jackhammers shall not be used.

ii. Debris shall be removed from the roof by means of an enclosed chute to minimise the spread of dust. Debris shall be kept watered down to minimise dust.

iii. Care shall be taken at all times to minimise damage to the substrate concrete.

iv. The surface of the concrete shall be cleaned of the existing screed, dust, laitance and other deleterious materials to the approval of the S.O. The prepared concrete surface shall be inspected by the S.O. and approved, prior new waterproofing system application.

v. The Contractor shall record the location of all cracks in the top surface of the concrete. The Contractor shall inform the S.O. immediately that cracks have been observed. The S.O. shall inspect the cracks and determine whether any breakout or other works are required at the crack location.

3.2. Waterproofing Application

3.2.1 Application Of Liquid Applied Waterproofing Coating

i. Placement of the new waterproof coating shall take place after the sealing of expansion joints, construction joints, sealing of cracks, survey of slab and any other works deemed necessary by the S.O. and has been completed and approved as satisfactory by the S.O.

ii. The moisture content of the concrete shall be below the threshold which can cause blister defects in the waterproof coating by vapour pressure after application.

iii. Where the Contractor selects to use a liquid applied waterproofing coating, application shall be to the satisfaction of the S.O. and in accordance with the manufacturer's instruction.

iv. The liquid material shall be a polyurethane based and elastomeric.

v. Detailing around pipes penetrating through the roof slab shall be to the satisfaction of the S.O. and in accordance with the manufacturer's recommendation.

vi. Upstands are to be formed by dressing the coating into 30 mm x 20 mm chase bearing firmly on a mortar fillet and fill up with sealants. The coating is then to be protected by plastering and a continuous aluminium flashing over.

vii. Where the coating crosses an expansion joint, an upstand beam shall be constructed for waterproofing termination. The joint shall be treated with suitable sealant with Expancell as the backing rod before the joint is covered with stainless steel flashing and seal off with sealant.

viii. All areas covered with liquid applied waterproofing coating shall be protected with protective screed laid to fall and casted in 1.2m x 1.2m panels. The protective screed is not required when using exposed waterproofing system (mineral finished).

3.2.2 Application Of Torch-On Waterproofing Membrane

i. Placement of the new waterproof membrane shall take place after the sealing of expansion joints, construction joints, sealing of cracks, survey of slab and any other works deemed necessary by the S.O. and has been completed and approved as satisfactory by the S.O.

ii. The moisture content of the concrete shall be below the threshold which can cause blister defects in the waterproof membrane by vapour pressure after application.

iii. Where the Contractor elects to use a torch-on system, application shall be to the satisfaction of the S.O. and in accordance with the manufacturer's instruction.

iv. The material shall be bituminous based waterproofing membrane with sand for area to be covered by protective screed, or with slated for area which is exposed to sun and UV.

v. Detailing around pipes penetrating through the roof slab shall be to the satisfaction of the S.O. and in accordance with the manufacturer's recommendation.

vi. Upstands are to be formed by dressing the membrane into 30 mm x 20 mm chase bearing firmly on a mortar fillet and fill up with sealants. The membrane is then to be protected by plastering and a continuous aluminium flashing over.

vii. Where the membrane crosses an expansion joint, an upstand beam shall be constructed for waterproofing termination. The joint shall be treated with suitable sealant with Expancell as the backing rod before the joint is covered with stainless steel flashing and seal off with sealant.

3.3. Quality Control Testing

i. Where requested by the S.O. the Contractor shall test areas of replacement waterproofing membrane and/or joints by ponding water to a depth of 25 mm and observing leakage for a period of 24 hours. The Contractor shall propose a suitable means of retaining the water. The Contractor shall notify the S.O. prior to the initiation of test. The results of this test shall be carefully logged and suitable certificate issued to the S.O.

ii. Such test shall be carried out at the rate of one 50 mm^2 panel per 500 mm^2 completed.