TECHNICAL PROPOSAL FOR WATERPROOFING TREATMENTS

SYSTEM RECOMMENDATION

This document is the technical proposal for waterproofing treatment in the following areas:-

Area 1..... Basement structures positive sides – Below raft, retaining walls, lift pits, UG sumps and water tanks

Area 2..... Internal side of UG Sump and water tanks

Area 3..... Wet areas with sunken portions

Area 4..... Terrace area

Option 1 .... Protected grade liquid applied waterproofing membrane using WPM 002

Option 2 .... Exposed grade liquid applied waterproofing membrane using WPM 350

Option 3 .... Exposed grade sheet applied waterproofing membrane using Butynol

Option 4 .... Protected grade sheet applied waterproofing membrane using WPM 1000 X

Option 5 .... Protected grade sheet applied waterproofing membrane using WPM 3000 X

Option 6 .... Exposed grade sheet applied waterproofing membrane using WPM 3000 XC

Area 5..... Landscape areas

Area 6..... Swimming pool & water bodies

Area 7..... OHT – Over head Tank

Area 8..... Expansion joints

Location 1 .. Terrace area exposed grade waterproofing treatment.

Location 2 .. Terrace area protected grade waterproofing treatment.

Location 2 .. Internal floor

Location 3 .. Internal wall and ceiling areas

Location 4 .. External wall areas

Area 9..... Podium slab

Area 10..... Wet areas with dry wall

Area 11..... Small planter box

Area 12..... Facade treatment

Area 1.....Basement structures positive sides – Below raft, retaining walls, lift pits, UG sumps and water tanks

This proposal is based on the assumption that, sub base soil is compressed comprehensively leaving proper working place and PCC of minimum M 15 of 50 to 75 mm thick is laid with smooth steel trowel finish. Sufficient work space shall be provided around the retaining wall by excavating the earth as per standard slope.

The main features /benefits of this system are:

- Waterproof, quick and easy install.
- Bitumen/Asphalt compound modified with SBS and high tack resin.
- Membrane self seals on any punctures maintaining its water tightness.
- Positive vapour barrier and excellent Elongation.
- Accommodate structural movements.
- Membrane will adapt easily to irregularly shaped surfaces, and will stretch without breaking or cracking.
- The protective polymer film is highly resistant to acids alkalis and other pollutants.
- Installed without use of open flames.
- Ideal for installation in restricted spaces.
- The membrane can be adjusted, if initially placed in the wrong position, as the adhesive on the sheet achieves final adhesion only after a few minutes.

Specification details

System Proposed: SBS, self-adhesive sheet membrane made from two structural components, bitumen/asphalt compound modified with SBS and high tack resin over bitumen modified solvent-based primer coat.

Products Specified And Descriptions:

A 46: Rapid setting and rapid hardening external repair mortar. The properties as are follows:-

- Bulk density of powder : Approx 1.3 Kg / Ltr
- Weight of fresh mortar : Approx 1.8 Kg / Ltr
- Working time : 15 min
- Walkable : 2-3 hrs
- Application thickness : 2-30mm
- Compressive Strength : After 28 days 20.0 N/mm²

- Tensile Bending Strength : After 28 days 6.0 N/mm²
- Freeze thaw and salt resistant : yes
- Suitable for underfloor heating : yes

WPM 256: Two components water based epoxy polyamide act as high strength bonding bridge solution and admixture.

WPM 240: Bitumen modified solvent-based primer coat.

WPM 3000 X: It is a peel and stick bituminous/asphalt membrane protected by a cross-laminated, high-density polyethylene film. It is made from two structural components. Bitumen/asphalt compound modified with SBS and high tack resins. The properties of membranes are:-

- Thickness as per UNI 8202 : 1.5 mm
- Weight as per UNI 8202 : 1.6 kg/m^2
- Tensile strength long as per ASTM D 638 : 4.35 N/mm
- Tensile strength trans as per ASTM D 638 : 5.69 N/mm
- Longitudinal elongation of membrane as per ASTM D 638 : 435%
- Transverse elongation of membrane as per ASTM D 638 : 380%
- Tearing resistance long as per 8202/9 : 83.01 N
- Tearing resistance as per 8202/9 : 73.74 N
- Adhesion to primed concrete as per ASTM D 1000 : 4.9N/mm
- Adhesion to steel as per ASTM D 1000 : 5.8N/mm
- Puncture resistance as per ASTM E 154 : 246N/65mm
- Vapour transmission rate as per ASTM E 96 : 0.3g/m^2/24 Hrs
- Cold flexibility as per ASTM D 146 : -30^{0}C
- Environment resistance as per ASTM D 543 : Conforms

SU 10: Polyurethane based highly flexible sealant. The properties of cured sealant are as follows:-

- Hardness Shore A-DIN 53 505 : 20 - 25
- Modulus at 100% ISO 8339 : 0.20 - 0.25 Mpa
- Elongation at Break ISO 8339 : 250%
- Elastic recovery ISO 7389 : > 70%
- Water vapour Diffusion

NFT 30018	:	32g/m^2/24 hrs
• Movement Capability	:	25%

Treatment Methodology:

Scope ..... Positive sides of below raft, retaining walls, lift pits, UG sumps and tanks

Substrate ..... PCC and RCC walls

Surface Preparation ..... All sharp edges and protrusions shall be grinded and made level with the surface. All surfaces shall be made free from all debris, dust, dirt and other contaminants. Newly laid PCC / RCC shall be allowed to cure and dry completely.

Potholes Filling ..... All potholes shall be filled as follows:-

- Mix the 3 part of powder of A 46 to 1 part of clean water in mixing vessel and mix thoroughly to obtain lump free and slump resistant mortar using slow speed heavy duty drilling machine fixed with mixing paddle. The mix will have a working time of 15 min.
- Apply the mortar using trowel to the all potholes ensuring that the mortar "wets" the surface by trowelling in firmly, leaving the surface proud.
- After 15 minutes, finish off with wet sponge or sponge float.

Construction joints

Treatment ..... All construction joints shall be treated using epoxy modified mortar as follows:-

- Cut open the construction joints by making groove in the form of "V" shape at required size.
- Clean the grooves and 75mm wide at both side of the joint to make it free from all dirt, dust and other contaminants.
- Apply neat coat of WPM 256 in and around the groove.
- Apply epoxy modified mortar of CM 1:3 admixed with WPM 256 at dosage of 1 Ltr per bag of 50Kg cement over the wet neat coat of WPM 256.
- Finish the surface with neat steel trowel flush with the surface.
- Allow the applied mortar to cure and dry completely.

Priming..... All surfaces shall be primed using WPM 240, single component; solvent based bitumen primer using good quality of roller / brush and allowed to dry completely. Coverage shall be at 5-6 Sqm per Ltr. Actual coverage depends on the substrate porosity.

Waterproofing Detail ..... All waterproof membrane detailing shall be carried out strictly in accordance with professional working practices for the installation of sheet/liquid membranes and in accordance with ARDEX ENDURA recommendations.

Waterproofing Membrane..... Install a layer of WPM 3000 X, SBS bitumen membrane by "peel and stick" over the PCC slab extending 500 mm wide beyond the intended limit of walls.

WPM 3000 X shall be applied from the lowest point to enable laps to shed water. All rolls of WPM 3000 X are marked with a 60mm line. All edge and end laps must be overlapped minimum of 60mm and 100mm respectively. All end laps and exposed edges shall be sealed.

After the construction of raft / walls, the membrane shall be installed by priming the surface using WPM 240 as explained above. There will be significant additional stresses at this corner and these must be accommodated by installing an extra 300mm wide membrane at all corners before the application of the main membrane.

The membrane shall be installed for the full height of the wall or minimum 300mm above the soil level. At the bottom, overlap the floor membrane for width of 300mm wide.

Note ..... **Under any circumstances, the membrane shall not be left exposed to sun / UV light for long time.**

Membrane Protection..... The applied 3000 X shall be protected by installing 4mm PVC boards. The PVC boards shall be placed in position using Duct Tape / PVC Tape / similar.

Membrane termination..... The waterproofing membrane and the PVC protection boards shall be terminated at the wall surface using aluminium pressure bars and anchors screws. The edges shall be sealed by using SU 10, finishing flush with the surface.

Construction of the

Basement Structure ..... Construction of raft / Lift pit / UG sump / Tanks consist of number of critical civil activities like shuttering, reinforcing bars, concrete works, etc, hence it is necessary to take care not to damage the waterproofing membrane.

Earth filling ..... Earth filling (at the lift / pit walls sides) shall be done carefully without damaging the waterproofing membrane.

Area 2..... Internal side of UG Sump and water tanks

The main features /benefits of this system are:

- Can be safely applied to freshly laid hardened (green) concrete.
- Epoxy polyamide membrane as a barrier coat will enhance the performance
- The cured membrane will withstand 400 kPa hydrostatic pressure which is equivalent to a 40 metre head of water.
- Two components waterproofing membrane system designed for long lasting results.
- Excellent elongation and tensile strength (Elongation 333% as per AS 1145, tensile strength 2.9 MPa as per AS1145)
- Liquid reinforced: Excellent strength
- Single component, polyurethane, flexible sealant.

Specification details

System proposed: Two components advanced acrylic, cementitious modified, synthetic micro fibre reinforced membrane formulated to provide a tough, long lasting waterproofing system over water based epoxy polyamide moisture barrier coat over water based epoxy polyamide over un-pigmented sealer coat.

Products Specified And Descriptions:

SU 10: Polyurethane based highly flexible sealant. The properties of cured sealant are as follows:-

- Hardness Shore A-DIN 53 505 : 20 - 25
- Modulus at 100% ISO 8339 : 0.20 - 0.25 Mpa
- Elongation at Break ISO 8339 : 250%
- Elastic recovery ISO 7389 : > 70%
- Water vapour Diffusion
  NFT 30018 : 32g/m^2/24 hrs
- Movement Capability : 25%

WPM 256: Two components water based epoxy polyamide act as high strength bonding bridge solution and admixture.

WPM 200: Two components, water based epoxy polyamide un-pigmented sealer, binder used for sealing surfaces and providing a strong bond to difficult or improperly prepared surfaces.

WPM 300: Two components, water based epoxy polyamide barrier coating, which prevents rising dampness and the formation of efflorescence when used as single coat barrier coat.

WPM 002: Is two components advanced acrylic cementitious modified waterproofing membrane, tough, ready to use, fast drying, and specifically designed for use in sandwiched situations. The

product has been uniquely formulated with synthetic micro fibers to increase its strength. The properties are as follows:-

- Elongation at Break @ 7 days dry AS1145 : 332%
- Tensile Strength @ 7 days dry AS1145 : 1.7 MPa
  @Full Cure 28 days : 2.9 MPa
- Water Absorption AS A121 App K : 4.3%
- Shore A hardness - ASTM D2240 : Dry film 85 – 90
  : Wet film 75 - 80

WPM Deck Web: Non-Woven polyester glass filament reinforced reinforcing cloth of 50 Gsm. The properties are as follows:-

- Tensile strength at break : MD 160 daN/5cm(Avg) 120 daN/5cm(Min)
  CD 35 daN/5cm (Avg) 20 daN/5cm (Min)
- Elongation at break : MD 16% (Avg) 11%(Min)
  CD 40 %(Avg) 28 %(Min)

WPM 405: SBR based, multipurpose, concentrated, liquid polymer additive, which when used with sand/cement, greatly improves the bond strength and flexibility. The properties are as follows:-

- pH : 9 – 10
- Tensile adhesion over concrete(7 days) : 1.5 Mpa
- Hydrostatic pressure resistance : 50 psi(0.34 Mpa)
- As additive to screed Flexural strength : 3.3 Mpa

<u>Treatment Methodology:</u>

Scope ..... Internal side of UG Sump and water tanks

Substrate ..... RCC / RCC and brick walls with plastering

Surface Preparation ..... All floor and walls up to required height shall be cleaned to make it free from all dirt, dust, debris, laitance and other contaminants by mechanical means and wire brushing. All sharp edges and protrusions shall be grinded to make them flush with the surface. All new surfaces shall be allowed to cure and dry completely according to standard practice.

Pressure grouting is to be done in order to prevent the leakage of water through voids present in the concrete, which will be filled completely, especially in the construction joints. Pressure grouting is to be carried out only in case of high amount of porosity in the concrete.

Pressure grouting…….. The procedure will be as follows:

- Drill 12mm diameter holes in the concrete using pneumatic drill in a grid pattern at required spacing as per the site conditions but in no case exceeding 1mtr.
- The depth of the drilling shall be adequate to pump the grout to the intended locations in predetermined areas.
- PVC/GI nozzles shall be fixed in the holes drilled using a fast setting compound.
- Expansive Additive admixed with neat cement to achieve a uniform mix. Water shall be added to achieve required consistency
- The grout obtained thus is then injected under a pressure of 40psi grout pump to fill all possible pores and gaps left within the concrete mass. When the flow of grout stops, or when the grout flows out of the adjacent nozzles, pumping is stopped and the nozzle is tied up and allowed to set for 24 hours.
- The grouting holes shall be finished by removing the nozzles and finishing flush with the surface using A 45

Construction joints

Treatment ..... All construction joints shall be treated using epoxy modified mortar as follows:-

- Cut open the construction joints by making groove in the form of “V” shape at required size.
- Clean the grooves and 75mm wide at both side of the joint to make it free from all dirt, dust and other contaminants.
- Apply neat coat of WPM 256 in and around the groove.
- Apply epoxy modified mortar of CM 1:3 admixed with WPM 256 at dosage of 1 Ltr per bag of 50Kg cement over the wet neat coat of WPM 256.
- Finish the surface with neat steel trowel flush with the surface.

- Allow the applied mortar to cure and dry completely.

Waterproofing Detail ..... All waterproof membrane detailing shall be carried out strictly in accordance with professional working practices for the installation of Liquid / sheet membranes and in accordance with ARDEX ENDURA recommendations.

Sealant

Application ..... A bead of SU 10 shall be applied at pipe penetrations and cracks (if any) by making the groove in the form of "V" shape and allowed to dry completely.

Surface Consolidation ..... All corners and adjacent wall up to 300mm or up to skirting level shall be consolidated using polymer modified mortar as follows:-

- Mix WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin binder coat and spread the mix over the surface with brush (thickness not more than 2mm).
- Over wet binder coat, consolidate the vertical wall surfaces using polymer modified mortar at 8-10mm thick in CM 1:4 admixed with WPM 405 at a dosage of 1 Ltr per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate.
- All corners shall be finished with half round or fillet in shape.
- The applied plastered surface shall be allowed to cure and dry completely for 7 days.

Sealer and

Hydrostatic Pressure

Resistant coat ..... Apply hydrostatic pressure resistant, potable grade membranes to floor, and wall surfaces as follows:-

- WPM 200 is a 2 components product consisting of Part A and Part B which needs to be mixed in 1:1 ratio using heavy duty electric slow speed drill with necessary mixing paddle, to achieve a uniform mix before applying.

- Apply a coat of WPM 200 in 1 coat at coverage of 5 Sqm per litre. WPM 200 shall be applied liberally in order to seal the surface completely.
- WPM 300 is a 2 components product consisting of Part A and Part B which needs to be mixed in 1:1 ratio using heavy duty electric slow speed drill with necessary mixing paddle, to achieve a uniform mix before applying.
- Apply a coat of WPM 300 whilst the WPM 200 is still wet (to form a wet on wet application) at coverage of 3 Sqm and allow it to dry complete to touch dry.

Waterproofing Membrane..... **Mixing:** WPM 002 is a two components product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using heavy duty slow speed drilling machine fixed with mixing paddle to obtain a uniform mix.

Two coats of WPM 002 are required to achieve the correct dry film thickness of 1.00mm. Apply the first coat over the primed surface. Install the WPM Deck web at all corners and pipe penetrations over the wet surface of WPM 002 ensuring the WPM Deck web is completely embedded in the coat of WPM 002 and allowed to dry (4 hours at 23°C, 50% RH). Apply the second coat of WPM 002 in opposite direction to the first coat and allow it to dry completely.

Application Brush / Roller recommended: (A medium nap (8-12 mm pile) paint roller is recommended.) New rollers should be dampened with water before being used for the first time. For best results with a paint brush use a good quality, 50mm long bristle variety.

Installation Quality ..... It is critical that the application of 2nd coat over the 1st coat should be in right angle to that of 1st coat and the time gap of minimum 4 hours between the 1st and 2nd coat should be maintained strictly. Subsequent applications shall be carried out after 24 hrs followed by the application of 2nd coat of WPM 002.

Protection Plaster ..... **Binder coat:** Mix WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin slurry and spread the mix over the surface with brush (thickness not more than 2mm).

Plastering: Over wet binder coat, plaster to all waterproofed surfaces using polymer modified mortar at 12-15 mm thick in CM 1:4 admixed with WPM 405 at a dosage of 1 liter per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate. The applied plastered surface shall be allowed to cure for 7 days and allowed to dry completely.

Note ..... **Subsequent civil works shall be started after the complete curing and drying of protection plaster.**

Area 3..... Wet areas with sunken portions

The main features /benefits of this system are:

- Two components waterproofing membrane system designed for long lasting results.
- Excellent elongation and tensile strength (Elongation 333% as per AS 1145, tensile strength 2.9 MPa as per AS1145)
- Liquid reinforced: Excellent strength
- The addition of epoxy polyamide membrane as a barrier coat will enhance the performance.
- Single component, polyurethane, flexible sealant.

Specification details

System proposed: Two components advanced acrylic, modified, synthetic micro fibre reinforced membrane formulated to provide a tough, long lasting waterproofing system over water based epoxy polyamide moisture barrier coat.

Products Specified And Descriptions:

SU 10: Polyurethane based highly flexible sealant. The properties of cured sealant are as follows:-

- Hardness Shore A-DIN 53 505 : 20 - 25
- Modulus at 100% ISO 8339 : 0.20 - 0.25 Mpa
- Elongation at Break ISO 8339 : 250%
- Elastic recovery ISO 7389 : > 70%
- Water vapour Diffusion
  NFT 30018 : 32g/m^2/24 hrs
- Movement Capability : 25%

WPM 256: Two components water based epoxy polyamide act as high strength bonding bridge solution and admixture.

WPM 300: Two components, water based epoxy polyamide barrier coating, which prevents rising dampness and the formation of efflorescence when used as single coat barrier coat.

WPM 002: Is two components advanced acrylic cementitious modified waterproofing membrane, tough, ready to use, fast drying, and specifically designed for use in sandwiched situations. The product has been uniquely formulated with synthetic micro fibers to increase its strength. The properties are as follows:-

- Elongation at Break @ 7 days dry AS1145 : 332%

- Tensile Strength @ 7 days dry AS1145 : 1.7 MPa
  @Full Cure 28 days : 2.9 MPa
- (Water Absorption AS A121 App K : 4.3%)
- Shore A hardness - ASTM D2240 : Dry film 85 – 90
  : Wet film 75 - 80

WPM Deck Web: Non-Woven polyester glass filament reinforced reinforcing cloth of 50 Gsm. The properties are as follows:-

• Tensile strength at break	:	MD	160 daN/5cm(Avg)	120 daN/5cm(Min)
		CD	35 daN/5cm (Avg)	20 daN/5cm (Min)
• Elongation at break	:	MD	16% (Avg)	11%(Min)
		CD	40 %(Avg)	28 %(Min)

WPM 405: SBR based, multipurpose, concentrated, liquid polymer additive, which when used with sand/cement, greatly improves the bond strength and flexibility. The properties are as follows:-

- pH : 9 – 10
- Tensile adhesion over concrete(7 days) : 1.5 Mpa
- Hydrostatic pressure resistance : 50 psi(0.34 Mpa)
- As additive to screed Flexural strength : 3.3 Mpa

<u>Treatment Methodology:</u>

Scope ..... Wet area with sunken portions

Substrate ..... RCC and brick walls

Surface Preparation ..... All RCC floor area and sunken portions including wall up to skirting level or minimum of 300mm, shall be cleaned to make it free from all dirt, dust, debris, laitance and other contaminants by mechanical means and wire brushing. All sharp edges and protrusions shall be grinded to make them flush with the surface. All new surfaces shall be allowed to cure and dry completely according to standard practice. The provided floor surface shall have proper slope towards the outlet pipe.

Waterproofing Detail ..... All waterproof membrane detailing shall be carried out strictly in accordance with professional working practices for the installation of Liquid / sheet membranes and in accordance with ARDEX ENDURA recommendations.

Sealant

Application ..... A bead of SU 10 shall be applied at all pipe penetrations and cracks (if any) by making the groove in the form of "V" shape and allowed to dry completely.

Construction joints

Treatment ..... All construction joints shall be treated using epoxy modified mortar as follows:-

- Cut open the construction joints by making groove in the form of "V" shape at required size.
- Clean the grooves and 75mm wide at both side of the joint to make it free from all dirt, dust and other contaminants.
- Apply neat coat of WPM 256 in and around the groove.
- Apply epoxy modified mortar of CM 1:3 admixed with WPM 256 at dosage of 1 Ltr per bag of 50Kg cement over the wet neat coat of WPM 256.
- Finish the surface with neat steel trowel flush with the surface.
- Allow the applied mortar to cure and dry completely.

Surface Consolidation ..... All corners and adjacent wall up to 300mm or up to skirting level shall be consolidated using polymer modified mortar as follows:-

- Mix WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin binder coat and spread the mix over the surface with brush (thickness not more than 2mm).
- Over wet binder coat, consolidate the vertical wall surfaces using polymer modified mortar at 8-10mm thick in CM 1:4 admixed with WPM 405 at a dosage of 1 Ltr per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate.
- The applied plastered surface shall be allowed to cure and dry completely for 7 days.

Coving Installation ..... Coving shall be installed at all corners using polymer modified mortar as follows:-

- Apply binder coat of WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin slurry and spread the mix over the surface with brush (thickness not more than 2mm).
- Install the polymer modified mortar over wet binder coat, at all corners in required size in half round or fillet in shape using CM 1:4 admixed with WPM 405 at a dosage of 1 Ltr per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate.
- The installed coving shall be allowed to cure and dry completely for 7 days.

Moisture Barrier Coat ..... **Mixing:** WPM 300 is a 2 components product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using heavy duty slow speed drilling machine fixed with mixing paddle to obtain a uniform mix.

Application: All surfaces to which the waterproofing membrane is to be installed shall be primed using WPM 300 in one coat at coverage of $3m^2$ per Ltr. The application shall be done to all floor and sunken area including 300 mm high on wall or up to skirting level.

Waterproofing Membrane..... **Mixing:** WPM 002 is a two components product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using heavy duty slow speed drilling machine fixed with mixing paddle to obtain a uniform mix.

Two coats of WPM 002 are required to achieve the correct dry film thickness of 1.00mm. Apply the first coat over the primed surface. Install the WPM Deck web at all corners and pipe penetrations over the wet surface of WPM 002 ensuring the WPM Deck web is completely embedded in the coat of WPM 002 and allowed to dry (4 hours at 23°C, 50% RH). Apply the second coat of WPM 002 in opposite direction to the first coat and allow it to dry completely.

Application Brush / Roller recommended: (A medium nap (8-12mm pile) paint roller is recommended.) New rollers should be dampened with

water before being used for the first time. For best results with a paint brush use a good quality, 50mm long bristle variety.

Installation Quality ..... It is critical that the application of 2nd coat over the 1st coat should be in right angle to that of 1st coat and the time gap of minimum 4 hours between the 1st and 2nd coat should be maintained strictly. Subsequent applications shall be carried out after 24 hrs followed by the application of 2nd coat of WPM 002.

Protection Plaster ..... **Binder coat:** Mix WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin slurry and spread the mix over the surface with brush (thickness not more than 2mm).

Plastering: Over wet binder coat, plaster to all waterproofed surfaces using polymer modified mortar at 12-15 mm thick in CM 1:4 admixed with WPM 405 at a dosage of 1 liter per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate. The applied plastered surface shall be allowed to cure for 7 days and allowed to dry completely.

Note ..... **Subsequent civil works shall be started after the complete curing and drying of protection plaster.**

Area 4.....Terrace areas

The Terrace area waterproofing treatment shall be carried out in two methods and are as follows:-

Option 1 .... Protected grade liquid applied waterproofing membrane using WPM 002

Option 2 .... Exposed grade liquid applied waterproofing membrane using WPM 350

Option 3 .... Exposed grade sheet applied waterproofing membrane using Butynol

Option 4 .... Protected grade sheet applied waterproofing membrane using WPM 1000 X

Option 5 .... Protected grade sheet applied waterproofing membrane using WPM 3000 X

Option 6 .... Exposed grade sheet applied waterproofing membrane using WPM 3000 XC

Option 1.....Protected grade liquid applied waterproofing membrane using WPM 002

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- Two components waterproofing membrane system designed for long lasting results.
- Excellent elongation and tensile strength (Elongation 333% as per AS 1145, tensile strength 2.9 MPa as per AS1145)
- Liquid reinforced: Excellent strength
- The addition of epoxy polyamide membrane as a barrier coat will enhance the performance.
- Single component, polyurethane, flexible sealant.

Specification details

System proposed: Two components advanced acrylic, modified, synthetic micro fibre reinforced membrane formulated to provide a tough, long lasting waterproofing system over water based epoxy polyamide moisture barrier coat.

Products Specified And Descriptions:

SU 10: Polyurethane based highly flexible sealant. The properties of cured sealant are as follows:-

- Hardness Shore A-DIN 53 505 : 20 - 25
- Modulus at 100% ISO 8339 : 0.20 - 0.25 Mpa
- Elongation at Break ISO 8339 : 250%
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- Water vapour Diffusion
  NFT 30018 : 32g/m^2/24 hrs
- Movement Capability : 25%

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• Elongation at Break @ 7 days dry AS1145	:	332%
• Tensile Strength @ 7 days dry AS1145	:	1.7 MPa
@Full Cure 28 days	:	2.9 MPa
• Water Absorption AS A121 App K	:	4.3%
• Shore A hardness - ASTM D2240	:	Dry film 85 – 90
	:	Wet film 75 - 80

WPM Deck Web: Non-Woven polyester glass filament reinforced reinforcing cloth of 50 Gsm. The properties are as follows:-

• Tensile strength at break	:	MD	160 daN/5cm(Avg)	120 daN/5cm(Min)
		CD	35 daN/5cm (Avg)	20 daN/5cm (Min)
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		CD	40 %(Avg)	28%(Min)

WPM 405: SBR based, multipurpose, concentrated, liquid polymer additive, which when used with sand/cement, greatly improves the bond strength and flexibility. The properties are as follows:-

• pH	:	9 – 10
• Tensile adhesion over concrete(7 days)	:	1.5 Mpa
• Hydrostatic pressure resistance	:	50 psi(0.34 Mpa)
• As additive to screed Flexural strength	:	3.3 Mpa

<u>Treatment Methodology:</u>

Scope ..... Roof and Deck areas

Substrate ..... RCC and brick walls with plastering

Surface Preparation ..... All floor area including wall up to skirting level or minimum of 300mm, shall be cleaned to make it free from all dirt, dust, debris, laitance and other contaminants by mechanical means and wire brushing. All sharp edges and protrusions shall be grinded to make them flush with the surface. All new surfaces shall be allowed to cure and dry completely

according to standard practice. The provided floor surface shall have proper slope towards the outlet pipe.

Waterproofing Detail ..... All waterproof membrane detailing shall be carried out strictly in accordance with professional working practices for the installation of Liquid / sheet membranes and in accordance with ARDEX ENDURA recommendations.

Sealant

Application ..... A bead of SU 10 shall be applied at all pipe penetrations and cracks (if any) by making the groove in the form of "V" shape and allowed to dry completely.

Surface Consolidation ..... All corners and adjacent wall up to 300mm or up to skirting level shall be consolidated using polymer modified mortar as follows:-

- Mix WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin binder coat and spread the mix over the surface with brush (thickness not more than 2mm).
- Over wet binder coat, consolidate the vertical wall surfaces using polymer modified mortar at 8-10mm thick in CM 1:4 admixed with WPM 405 at a dosage of 1 Ltr per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate.
- All corners shall be finished with half round or fillet in shape.
- The applied plastered surface shall be allowed to cure and dry completely for 7 days.

Moisture Barrier Coat ..... **Mixing:** WPM 300 is a 2 components product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using heavy duty slow speed drilling machine fixed with mixing paddle to obtain a uniform mix.

Application: All surfaces to which the waterproofing membrane is to be installed shall be primed using WPM 300 in one coat at coverage of $3m^2$ per Ltr. The application shall be done to all floor area including 300mm high on wall.

Waterproofing

Membrane..... **Mixing:** WPM 002 is a two components product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using heavy duty slow speed drilling machine fixed with mixing paddle to obtain a uniform mix.

Two coats of WPM 002 are required to achieve the correct dry film thickness of 1.00mm. Apply the first coat over the primed surface. Install the WPM Deck web at all corners and pipe penetrations over the wet surface of WPM 002 ensuring the WPM Deck web is completely embedded in the coat of WPM 002 and allowed to dry (4 hours at 23°C, 50% RH). Apply the second coat of WPM 002 in opposite direction to the first coat and allow it to dry completely.

Application Brush / Roller recommended: (A medium nap (8-12 mm pile) paint roller is recommended.) New rollers should be dampened with water before being used for the first time. For best results with a paint brush use a good quality, 50mm long bristle variety.

Installation Quality ..... It is critical that the application of 2nd coat over the 1st coat should be in right angle to that of 1st coat and the time gap of minimum 4 hours between the 1st and 2nd coat should be maintained strictly. Subsequent applications shall be carried out after 24 hrs followed by the application of 2nd coat of WPM 002.

Protection Plaster ..... **Binder coat:** Mix WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin slurry and spread the mix over the surface with brush (thickness not more than 2mm).

Plastering: Over wet binder coat, plaster to all waterproofed surfaces using polymer modified mortar at 12-15 mm thick in CM 1:4 admixed with WPM 405 at a dosage of 1 liter per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate. The applied plastered surface shall be allowed to cure for 7 days and allowed to dry completely.

Note ..... **Subsequent civil works shall be started after the complete curing and drying of protection plaster.**

Option 2.....Exposed grade liquid applied waterproofing membrane using WPM 350

The main features /benefits of this system are:

- Roof & deck two component waterproofing membrane system designed for terrace areas for long lasting.
- Tough, UV stable, mildew resistant and flexible results liquid applied waterproofing membrane.
- The addition of epoxy polyamide membrane as a sealer and barrier coat will enhance the performance.
- Self cleansing and low dirt retention
- Decorative and large range of durable colours
- Vapour permeable (allow façade substrate to breath)
- Addition of water based epoxy polyamide primer will enhance the performance.
- Water based, safe to use, low odour and easy cleaning

Specification details

System proposed: Two components, UV resistant, mildew resistant, fibre reinforced membrane formulated to provide a tough, long lasting waterproofing system on primed surfaces of water based epoxy polyamide, moisture barrier.

Product description:

WPM 405: SBR based, multipurpose, concentrated, liquid polymer additive / bonding agent. The properties are as follows:-

- pH : 9 – 10
- Tensile adhesion over concrete(7 days) : 1.5 Mpa
- Hydrostatic pressure resistance : 50 psi(0.34 Mpa)
- As additive to screed Flexural strength : 3.3 Mpa

SU 10: Polyurethane based highly flexible sealants. The properties of cured sealant are as follows:-

- Hardness Shore A-DIN 53 505 : 20 - 25
- Modulus at 100% ISO 8339 : 0.20 - 0.25 Mpa
- Elongation at Break ISO 8339 : 250%
- Elastic recovery ISO 7389 : > 70%
- Water vapour Diffusion
  NFT 30018 : 32g/m^2/24 hrs
- Movement Capability : 25%

WPM 300: Two components, water based epoxy polyamide barrier coat.

WPM 350: Is two components cementitious acrylic modified waterproofing membrane, tough, UV resistant, ready to use, fast drying, and specifically designed for use exposed situations, uniquely formulated with synthetic microfibers to increase its strength. The properties are as follows:-

- Specific Gravity : Approx. 1.01 kg/litre
- Bulk Density : Approx. 1.4 kg/litre
- Water absorption AS A 121 : App K 5%
- Tensile Strength AS 1145
  - 28 days dry : 2.0 MPa
  - after UV exposure : 2.3 MPa
- Elongation at Break - AS 1145
  - 28 days dry : 208%
  - after UV exposure : 155%
- Movement joint test CSIRO : Pass
- Overcoat time : 4 hrs @ 23°C 50% RH
- Pot life : 3 hrs @ 23°C 50% RH

WPM Deck Web: Non-Woven polyester glass filament reinforced reinforcing cloth. The properties are as follows:-

- Tensile strength at break : MD 160 daN/5cm(Avg) 120 daN/5cm(Min)
  CD 35 daN/5cm(Avg) 20 daN/5cm (Min)
- Elongation at break : MD 16% (Avg) 11%(Min)
  CD 40%(Avg) 28%(Min)

<u>Treatment Methodology:</u>

Scope ..... Terrace area

Substrate ..... RCC and brick wall

Surface Preparation ..... All terrace floor area including parapet wall 300mm high, shall be cleaned to make it free from all dirt, dust, debris, laitance and other contaminants by mechanical means and wire brushing. All sharp edges and protrusions shall be grinded to make them flush with the surface. The terrace area shall have sufficient slope towards the rain out let pipes. New surfaces shall be allowed to cure and dry completely.

Waterproofing Detail ..... All waterproof membrane detailing shall be carried out strictly in accordance with professional working practices for the installation of Liquid / sheet membranes and in accordance with ARDEX ENDURA recommendations.

Sealant

Application ..... A bead of SU 10 shall be applied at all pipe penetrations and cracks (if any) by making the groove in the form of "V" shape and allowed to dry completely.

Surface Consolidation ..... All corners and adjacent wall up to 300mm or up to skirting level shall be consolidated using polymer modified mortar as follows:-

- Mix WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin binder coat and spread the mix over the surface with brush (thickness not more than 2mm).
- Over wet binder coat, consolidate the vertical wall surfaces using polymer modified mortar at 8-10mm thick in CM 1:4 admixed with WPM 405 at a dosage of 1 Ltr per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate.
- All corners shall be finished with half round or fillet in shape.
- The applied plastered surface shall be allowed to cure and dry completely for 7 days.

Moisture Barrier Coat ..... **Mixing:** WPM 300 is a 2 components product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using heavy duty slow speed drilling machine fixed with mixing paddle to obtain a uniform mix.

Application: All surfaces to which the waterproofing membrane is to be installed shall be primed using WPM 300 in one coat at coverage of $3m^2$ per Ltr. The application shall be done to all floor area including 300 mm high on wall.

Waterproofing

Membrane..... **Mixing:** WPM 350 is a two components product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using

heavy duty slow speed drilling machine fixed with mixing paddle to obtain a uniform mix.

Two coats of WPM 350 are required to achieve the correct dry film thickness of 1.50mm. Apply the first coat over the primed surface. Install the WPM Deck web on wet surface of WPM 350 including 300mm high on wall ensuring the WPM Deck web is completely embedded in the coat of WPM 350 and allowed to dry (4 hours at 23°C, 50% RH). Apply the second coat of WPM 350 in opposite direction to the first coat and allow it to dry completely.

Application Brush / Roller recommended: (A medium nap (8-12 mm pile) paint roller is recommended.) New rollers should be dampened with water before being used for the first time. For best results with a paint brush use a good quality, 50mm long bristle variety.

Installation Quality ..... It is critical that the application of 2nd coat over the 1st coat should be in right angle to that of 1st coat and the time gap of minimum 4 hours between the 1st and 2nd coat should be maintained strictly. Subsequent applications shall be carried out after 24 hrs followed by the application of 2nd coat of WPM 350.

Option 3.....Exposed grade sheet applied waterproofing membrane using Butynol®

The main features/benefits of this system are:

BUTYNOL® Protection

BUTYNOL protects against water, moisture vapor, gases, sun, ozone, frost, acids, chemicals and bacteria.

BUTYNOL® Resistance

BUTYNOL resists tearing, flex cracking, bubbling and abrasion. It is extremely strong, has a long life and is versatile.

Seam Tape Performance

Tests on the seam tape bonding method, by an independent testing laboratory, have shown average values equivalent to 90% of welded material. It is considered impossible for the test methods used to be duplicated in normal service.

Specification Details

System Proposed: BUTYNOL is a synthetic rubber membrane of 1.20 mm thick with properties which resist ageing from heat, sunlight and ozone. It has excellent gas impermeability and toughness and remains flexible at low temperatures.

BUTYNOL is manufactured by combining the petroleum gases isobutylene and isoprene at the extremely low temperature of –100°C. (Rubber Technology–Morton)

BUTYNOL is marketed by ARDEX ENDURA as warranted roofing and tanking product and fixed by their trained and experienced approved Applicators.

Products Specified And Descriptions:

A 46: Rapid setting and rapid hardening external repair mortar. The properties as are follows:-

- Bulk density of powder : Approx 1.3 Kg / Ltr
- Weight of fresh mortar : Approx 1.8 Kg / Ltr
- Working time : 15 min
- Walkable : 2-3 hrs
- Application thickness : 2-30mm
- Compressive Strength : After 28 days 20.0 N/mm²
- Tensile Bending Strength : After 28 days 6.0 N/mm²
- Freeze thaw and salt resistant : yes
- Suitable for underfloor heating : yes

WPM 405: SBR based, multipurpose, concentrated, liquid polymer additive / bonding agent. The properties are as follows:-

- pH : 9 – 10
- Tensile adhesion over concrete(7 days) : 1.5 Mpa
- Hydrostatic pressure resistance : 50 psi(0.34 Mpa)
- As additive to screed Flexural strength : 3.3 Mpa

BUTYNOL®

BUTYNOL is 1.20 mm thick synthetic rubber with properties which resist ageing from heat, sunlight and ozone. It has excellent gas impermeability and toughness and remains flexible at low temperatures. The technical performance data are:-

- Specific Gravity to ASTM D297 : 1.20±0.05
- Hardness IRHD to ASTM D1415 : 65±5
- Tensile Strength to ASTM D412 : 8.3 MPa min
- Modulus at 300% elongation to ASTM D412 : 4.15 MPa min
- Elongation at break to ASTM D412 : 300% min
- Heat Ageing : 7 days at 115° C
  - Tensile Retention to ASTM D412 : 70% min
  - Elongation Retention to ASTM D412 : 70% min
  - Tear Strength to ASTM D624 : 26kN/m
  - Ozone Resistance to ASTM D1149 : No visible cracks (if any)
    (7 days at 40°C in 50pphm ozone)
- Water Absorption to ASTM D471 : 1.65% (by mass) 0.72% (by volume)
- Water Permeability to ASTM E96-92
- Vapor Flow Resistance : (MNs/g) 12414
- Vapor Flow Rate : (g/m2d) 0.013
  - Note: Interesting comparable figures for water permeability are
  - Polythene : 156
  - Asphalt : 1830
  - P.V.C. : 4900.
- K Values on 1mm BUTYNOL sheeting
  - K Value (Thermal Conductivity) : 7.4×10^{3}Cal/cm/sec/^{0}C.
- Conductivity Data on 1mm BUTYNOL sheeting
  - Resistance/m^2 Ω / m^2 : 0.6816 on 9.3 volts.

WA 98 - The Standard contact brushing, spray grade and rolling adhesive for fixing to the substrate and for laps not subject to periodic ponding.

SEAM TAPE - Seam tape (50mm X 30.50 Mtr) is uncured butyl cold gum based tape for lap bonding of BUTYNOL sheets.

SEAM PRIMER -A water resistant primer, used with seam tape for general lap bonding.

DETAIL TAPE - A malleable exterior tape for flashing exterior corners etc. (150 mm x 30.5 m roll).

FLASHING TAPE - Flashing tape is a malleable tape for moulding in gussets, pipe flashings and awkward situations and supplied in 100mm x 5m rolls. Flashing tape must not be left exposed. A cover strip of BUTYNOL or detail tape must be applied over flashing tape to finish.

SU 10 - Polyurethane UV resistant, highly flexible heavy duty sealant is available in tubes for caulking guns.

PRESSURE BARS - Specially designed powder coated aluminum pressure bars with necessary anchor screws for membrane termination

Treatment Methodology:

Scope ..... Terrace area

Substrate ..... RCC and brick wall

Surface Preparation ..... All floor and 300 mm high on the wall area shall be cleaned to make it free from dirt, dust and other contaminants. Grinding all surface to make them flush with the surface. Floor area shall have sufficient slope towards rain outlet pipes. All new surfaces shall be allowed to cure and dry completely.

Waterproofing Detail ..... All waterproof membrane detailing shall be carried out strictly in accordance with professional working practices for the installation of sheet membranes and in accordance with ARDEX ENDURA recommendations.

Potholes Filling ..... All potholes shall be filled as follows:-

- Mix the 3 part of powder of A 46 to 1 part of clean water in mixing vessel and mix thoroughly to obtain lump free and slump resistant mortar using slow speed heavy duty drilling machine fixed with mixing paddle. The mix will have a working time of 15 min.
- Apply the mortar using trowel to the all potholes ensuring that the mortar "wets" the surface by trowelling in firmly, leaving the surface proud.
- After 15 minutes, finish off with wet sponge or sponge float.

Surface Consolidation ..... All corners and adjacent wall up to 300mm or up to skirting level shall be consolidated using polymer modified mortar as follows:-

- Mix WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin binder coat and spread the mix over the surface with brush (thickness not more than 2mm).

- Over wet binder coat, consolidate the vertical wall surfaces using polymer modified mortar at 8-10mm thick in CM 1:4 admixed with WPM 405 at a dosage of 1 Ltr per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate.
- All corners shall be finished with half round or fillet in shape.
- The applied plastered surface shall be allowed to cure and dry completely for 7 days.

BUTYNOL Installation..... All extruded corners and pipe penetrations shall be made water tight using Flashing tape and WA 98. BUTYNOL, 1.2mm thick sheet shall be unrolled and spread over the prepared area and allowed to remain in this position for approximately one hour to relieve stresses induced in the process of manufacture and storage. The BUTYNOL sheet shall be set out in the exact position in which it will be finally required, avoiding wrinkles and the inclusion of air bubbles. WPM 98, single component, ready to use adhesive shall be applied to the substrate and the corresponding area of BUTYNOL sheet which may then, when the adhesive is touch dry, be worked back into its required position avoiding wrinkles and the inclusion of air bubbles.

BUTYNOL Lapping ..... The top lap is positioned and the bottom sheet marked to indicate the edge of the top sheet. The top sheet is folded back. The WPM 98/ARDEX Seam primer is then applied to the BUTYNOL in the area marked on the bottom sheet and 60mm in from the edge on the top sheet. The ARDEX Seam Primer is applied to the meeting surfaces using a synthetic scrubbing pad. Allow the primer to become tacky.

Position and unroll the 50mm ARDEX Seam Tape along the seam. The edge of the seam tape should be aligned to the mark on the bottom membrane sheet. The see-through backing film makes this very simple. Roll the length of the seam with backing film still in place. Remove the backing film from the ARDEX Seam Tape by pulling at a 45° angle away from the seam. Keep the backing film low to the roof surface as it is removed. Fold into place the primed edge of the top sheet. Roll the completed seam using hand rubber roller.

Membrane termination..... Terminate the edge of the membranes onto the wall by fixing aluminium pressure bars using Hilti anchor screws followed by filling up the SU 10 sealant making flush with the wall surface.

Option 3.....Protected grade sheet applied waterproofing membrane using WPM 1000 X

The main features /benefits of this system are:

- Waterproof, quick and easy install
- Decoupling from poor substrate
- Constant thickness
- Fast track continuation of further works

Specification details

System proposed: Two outer layers of polypropylene non-woven membrane, one inner layer of polyethylene waterproofing and decoupling membrane along with two components advanced acrylic, modified, synthetic micro fibre reinforced membrane formulated to provide a tough, long lasting waterproofing system for sheet joint treatments.

Product description:

WPM 405: SBR based, multipurpose, concentrated, liquid polymer admixture / bonding agent. The properties are as follows:-

- pH : 9 – 10
- Tensile adhesion over concrete(7 days) : 1.5 Mpa
- Hydrostatic pressure resistance : 50 psi(0.34 Mpa)
- As additive to screed Flexural strength : 3.3 Mpa

SU 10: Polyurethane based highly flexible sealants. The properties of cured sealant are as follows:-

- Hardness Shore A-DIN 53 505 : 20 - 25
- Modulus at 100% ISO 8339 : 0.20 - 0.25 Mpa
- Elongation at Break ISO 8339 : 250%
- Elastic recovery ISO 7389 : > 70%
- Water vapour Diffusion
  NFT 30018 : 32g/ m^2/24 hrs
- Movement Capability : 25%

Gold Star Adhesive: Highly polymer modified, high strength, cement based flexible adhesive for fixing WPM 1000 X. The properties are as follows:-

- Pot life @27±2^{0}C : 3 Hrs
- Open time : 20 min
- Setting time @27±2^{0}C : 24 Hrs
- Temperature resistance : -30^0 to 150^{0}C
- Shear adhesion for 14 days : 12.00 KN Dry & 7.50 KN Wet Conditions
- Tensile adhesion for 14 days : 1.30 KN Dry & 1.00 KN Wet Conditions

WPM 1000 X: Polyethylene waterproof and decoupling membrane sandwiched between two layers of polypropylene non woven membranes. The properties are as follows:-

- Total thickness : approx. 0.4 mm
- Material weight : approx. 170 g / m²
- Resistance to temperature min. / max : - 5°C / + 90°C
- Length per roll : 50 Mtr
- Burst pressure max : Internal 2.5 bar
- Breaking load longitudinal / lateral DIN 527-3 : 70 N/>15 mm
- Extension break longitudinal / lateral DIN 527-3 : ≥70 %
- Power absorption at 25% Elasticity lateral DIN 527-3 : 1.8 N/mm
- Power absorption at 50% Elasticity lateral DIN 527-3 : 2.2 N/mm
- Resistance to water pressure DIN EN 1928 (Version B) : > 1.5 bar
- UV-Resistance: min. DIN EN ISO 4892-2 : 500 Hrs
- Moisture vapor resistance air equivalent (sd) DIN EN 1931 : > 30 m
- Bonding strength DIN EN 1348 : > 0.2 N / mm²
- Fire classification DIN EN 4102 : B 2

WPM 002: Is two components, advanced acrylic cementitious modified waterproofing membrane, uniquely formulated with synthetic micro fibers to increase its strength. The properties are as follows:-

- Elongation at Break @ 7 days dry AS1145 : 332%
- Tensile Strength @ 7 days dry AS1145 : 1.7 MPa
  @Full Cure 28 days : 2.9 MPa
- (Water Absorption AS A121 App K : 4.3%)
- Shore A hardness - ASTM D2240 : Dry film 85 – 90
  : Wet film 75 - 80

WPM Deck Web: Non-Woven polyester glass filament reinforced reinforcing cloth. The properties are as follows:-

• Tensile strength at break	:	MD	160 daN/5 cm(Avg)	120 daN/5 cm(Min)
		CD	35 daN/5 cm(Avg)	20 daN/ cm (Min)
• Elongation at break	:	MD	16% (Avg)	11%(Min)
		CD	40%(Avg)	28%(Min)

Treatment Methodology:

Scope ..... Terrace area

Substrate ..... RCC and brick wall

Surface Preparation ..... All floor and 300 mm high on the wall area shall be cleaned to make it free from dirt, dust and other contaminants. Grinding all surface to make them flush with the surface. Floor area shall have sufficient slope towards rain outlet pipes. All new surfaces shall be allowed to cure and dry completely.

Surface Consolidation ..... All corners and adjacent wall up to 300mm or up to skirting level shall be consolidated using polymer modified mortar as follows:-

- Mix WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin binder coat and spread the mix over the surface with brush (thickness not more than 2mm).
- Over wet binder coat, consolidate the vertical wall surfaces using polymer modified mortar at 8-10mm thick in CM 1:4 admixed with WPM 405 at a dosage of 1 Ltr per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate.
- All corners shall be finished with half round or fillet in shape.
- The applied plastered surface shall be allowed to cure and dry completely for 7 days.

Sealant

Application ..... A bead of SU 10 shall be applied at all pipe penetrations and cracks (if any) by making the groove in the form of "V" shape and allowed to dry completely.

WPM 1000 X Installation .... Mixing of adhesive and application of WPM 1000 X is as follows:-

- Add Gold star to clean water in ratio of 4:1 by weight and mix it using slow speed heavy duty drilling machine fixed with mixing paddle, until a slump free mortar is obtained. The adhesive is immediately ready for use and has a pot life of 3 hours.
- Spread the mixed adhesive to required areas in which WPM 1000 X can be applied over it at a time before the adhesive start its initial set; apply the adhesive to all surfaces including coving surfaces.
- Comb the adhesive at 3mm thick using notch trowel.
- Fix WPM 1000 X onto the adhesive neatly without any wrinkles and air pockets in it. Each adjacent sheet shall be provided with butt joint.
- After 24 hrs, all the butt joints, corners and pipe penetrations shall be treated using WPM Deck Web sandwiched in between 2 coats of WPM 002 and allowed to dry completely.
    - WPM 002 is a 2 component product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using heavy duty slow speed drilling machine fixed with mixing paddle to obtain a homogeneous mix.

Tiling and grouting ..... As per client's requirement, tiles shall be installed using recommended ARDEX ENDURA Adhesive by maintaining the joints gap of minimum 3mm to accommodate the movement. Tile joints shall be grouted using recommended ARDEX ENDURA Grout after the complete drying time of the adhesive.

Option 4.....Protected grade sheet applied waterproofing membrane using WPM 3000 X

The main features /benefits of this system are:

- Waterproof, quick and easy install.
- Bitumen/Asphalt compound modified with SBS and high tack resin.
- Membrane self seals on any punctures maintaining its water tightness.
- Positive vapour barrier and excellent Elongation.
- Accommodate structural movements.

- Membrane will adapt easily to irregularly shaped surfaces, and will stretch without breaking or cracking.
- The protective polymer film is highly resistant to acids alkalis and other pollutants.
- Installed without use of open flames.
- Ideal for installation in restricted spaces.
- The membrane can be adjusted, if initially placed in the wrong position, as the adhesive on the sheet achieves final adhesion only after a few minutes.

Specification details

System Proposed: SBS, self-adhesive sheet membrane made from two structural components, bitumen/asphalt compound modified with SBS and high tack resin over bitumen modified solvent-based primer coat.

Products Specified And Descriptions:

A 46: Rapid setting and rapid hardening external repair mortar. The properties as are follows:-

• Bulk density of powder	:	Approx 1.3 Kg / Ltr	
• Weight of fresh mortar	:	Approx 1.8 Kg / Ltr	
• Working time	:	15 min	
• Walkable	:	2-3 hrs	
• Application thickness	:	2-30mm	
• Compressive Strength (DIN 1164)	:	After 28 days	20.0 N/mm²
• Tensile Bending Strength (DIN 1164)	:	After 28 days	6.0 N/mm²
• Freeze thaw and salt resistant	:	yes	
• Suitable for underfloor heating	:	yes	

WPM 405: SBR based, multipurpose, concentrated, liquid polymer additive, which when used with sand/cement, greatly improves the bond strength and flexibility. The properties are as follows:-

• pH	:	9 – 10
• Tensile adhesion over concrete(7 days)	:	1.5 Mpa
• Hydrostatic pressure resistance	:	50 psi(0.34 Mpa)
• As additive to screed Flexural strength	:	3.3 Mpa

WPM 240: Bitumen modified solvent-based primer coat.

WPM 3000 X: It is a peel and stick, bituminous/asphalt membrane protected by a cross-laminated, high-density polyethylene film. It is made from two structural components. Bitumen/asphalt compound modified with SBS and high tack resins. The properties of membranes are:-

- Thickness as per UNI 8202 : 1.5 mm
- Weight as per UNI 8202 : 1.6 kg/ m^2
- Tensile strength long as per ASTM D 638 : 4.35 N/mm
- Tensile strength trans as per ASTM D 638 : 5.69 N/mm
- Longitudinal elongation of membrane as per ASTM D 638 : 435%
- Transverse elongation of membrane as per ASTM D 638 : 380%
- Tearing resistance long as per 8202/9 : 83.01 N
- Tearing resistance as per 8202/9 : 73.74 N
- Adhesion to primed concrete as per ASTM D 1000 : 4.9N/mm
- Adhesion to steel as per ASTM D 1000 : 5.8N/mm
- Puncture resistance as per ASTM E 154 : 246N/65mm
- Vapour transmission rate as per ASTM E 96 : 0.3g/ m^2/24 Hrs
- Cold flexibility as per ASTM D 146 : -30^0C
- Environment resistance as per ASTM D 543 : Conforms

SU 10: Polyurethane based highly flexible sealant. The properties of cured sealant are as follows:-

- Hardness Shore A-DIN 53 505 : 20 - 25
- Modulus at 100% ISO 8339 : 0.20 - 0.25 Mpa
- Elongation at Break ISO 8339 : 250%
- Elastic recovery ISO 7389 : > 70%
- Water vapour Diffusion NFT 30018 : 32g/ m^2/24 Hrs
- Movement Capability : 25%

<u>Treatment Methodology:</u>

Scope ..... Terrace area

Substrate ..... RCC

Surface Preparation ..... All floor and 300mm high on the wall area shall be cleaned to make it free from dirt, dust and other contaminants. Grinding all surface to make them flush with the surface. Floor area shall have sufficient slope

towards rain outlet pipes. All new surfaces shall be allowed to cure and dry completely.

Potholes Filling ..... All potholes shall be filled as follows:-

- Mix the 3 part of powder of A 46 to 1 part of clean water in mixing vessel and mix thoroughly to obtain lump free and slump resistant mortar using slow speed heavy duty drilling machine fixed with mixing paddle. The mix will have a working time of 15 min.
- Apply the mortar using trowel to the all potholes ensuring that the mortar "wets" the surface by trowelling in firmly, leaving the surface proud.
- After 15 minutes, finish off with wet sponge or sponge float.

Surface Consolidation ..... All corners and adjacent wall up to 300mm shall be consolidated using polymer modified mortar as follows:-

- Mix WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin binder coat and spread the mix over the surface with brush (thickness not more than 2mm).
- Over wet binder coat, consolidate the vertical wall surfaces using polymer modified mortar at 8-10mm thick in CM 1:4 admixed with WPM 405 at a dosage of 1 Ltr per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate.
- The applied plastered surface shall be allowed to cure and dry completely for 7 days.

Priming..... All surfaces shall be primed using WPM 240, single component; solvent based bitumen primer using good quality of roller / brush and allowed to dry completely. Coverage shall be at 5-6 Sqm per Ltr. Actual coverage depends on the substrate porosity.

Waterproofing Detail ..... All waterproof membrane detailing shall be carried out strictly in accordance with professional working practices for the installation of sheet/liquid membranes and in accordance with ARDEX ENDURA recommendations.

Waterproofing

Membrane..... Install a layer of WPM 3000 X, SBS bitumen membrane by "peel and stick" over the RCC wall surfaces from the lowest point to enable laps to shed water. All rolls of WPM 3000 X are marked with a 60mm line. All edge and end laps must be overlapped minimum of 60mm and 100mm respectively. All end laps and exposed edges shall be sealed.

There will be significant additional stresses at this corner and these must be accommodated by installing an extra 300mm wide membrane at all corners before the application of the main membrane.

The membrane shall be installed on all terrace floor area including extending on the wall up to intended finished level of protection screed.

Note ..... **Under any circumstances, the membrane shall not be left exposed to sun / UV light for long time.**

Membrane Protection..... The applied 3000 X shall be protected by installing 4mm PVC boards. The PVC boards shall be placed in position using Duct Tape / PVC Tape / similar.

Membrane Protection..... Membrane shall be protected by providing screed of minimum 45mm thick of M25 grade and allowed to cure and dry completely. All corners shall be made half round or fillet in shape.

Option 5.....Exposed grade sheet applied waterproofing membrane using WPM 3000 XC

The main features /benefits of this system are:

- Waterproof
- Self-Adhesive
- Cold applied without use of flames
- Total Vapour, Radon and Methane Gas Barrier
- Protected by reinforced aluminium film
- Excellent puncture resistance
- Resistant to UV rays
- Quick installation
- Installation does not require skilled personnel
- Elimination of risks deriving from the use of open flames
- Unaffected by environmental pollution and ozone
- Compatible with other waterproofing systems

Specification details

System Proposed: A self-adhesive bituminous compound with polyester reinforced aluminium film over bitumen modified solvent-based primer coat.

Products Specified And Descriptions:

A 46: Rapid setting and rapid hardening external repair mortar. The properties as are follows:-

- Bulk density of powder : Approx 1.3 Kg / Ltr
- Weight of fresh mortar : Approx 1.8 Kg / Ltr
- Working time : 15 min
- Walkable : 2-3 hrs
- Application thickness : 2-30mm
- Compressive Strength : After 28 days 20.0 N/mm²
- Tensile Bending Strength : After 28 days 6.0 N/mm²
- Freeze thaw and salt resistant : yes
- Suitable for underfloor heating : yes

WPM 405: SBR based, multipurpose, concentrated, liquid polymer additive / bonding agent. The properties are as follows:-

- pH : 9 – 10
- Tensile adhesion over concrete(7 days) : 1.5 Mpa
- Hydrostatic pressure resistance : 50 psi(0.34 Mpa)
- As additive to screed Flexural strength : 3.3 Mpa

WPM 240: Bitumen modified solvent-based primer coat.

WPM 3000 XC: It is a peel and stick, self-adhesive bituminous compound and is self-protected polyester reinforced aluminium film. The properties of membranes are:-

- Thickness : 1.2mm
- Adhesion to primed concrete as per ASTM D 1000 : >250N
- Adhesion to steel as per ASTM D 1000 : >250N
- Tensile strength as per EN 12311-1 : Long >200 N/50mm
Trans >200 N/50mm
- Elongation at break : Long >20%

as per EN 12311-1		Trans >20%
• Static load resistance	:	Met A 15 Kg
as per EN 12730		Met B 20 Kg
• Tear resistance of joints	:	Long 70 N
as per EN 12310-1		Trans 70 N
• Impermeability	:	≥ 60 Kpa
as per EN 1928		
• Vapour transmission rate	:	sd ≥ 1500 m
as per EN 1928		
• Radon transmission rate	:	0.47×10^{-9} m/s
• Permeability to radon gas	:	0.56×10^{-12} Smtr/s
• Application temperature	:	5^0C / 45^0C
• Service temperature	:	-40^0C / 80^0C
• Roll size	:	1 Mtr X 25 Mtr

SU 10: Polyurethane based highly flexible sealant. The properties of cured sealant are as follows:-

• Hardness Shore A-DIN 53 505	:	20 - 25
• Modulus at 100% ISO 8339	:	0.20 - 0.25 Mpa
• Elongation at Break ISO 8339	:	250%
• Elastic recovery ISO 7389	:	> 70%
• Water vapour Diffusion		
NFT 30018	:	32g/m^2/24 hrs
• Movement Capability	:	25%

<u>Treatment Methodology:</u>

Scope ..... Terrace area

Substrate ..... RCC and brick wall

Surface Preparation ..... All floor and 300mm high on the wall area shall be cleaned to make it free from dirt, dust and other contaminants. Grinding all surface to make them flush with the surface. Floor area shall have sufficient slope towards rain outlet pipes. All new surfaces shall be allowed to cure and dry completely.

Potholes Filling ..... All potholes shall be filled as follows:-

- Mix the 3 part of powder of A 46 to 1 part of clean water in mixing vessel and mix thoroughly to obtain lump free and slump resistant mortar using slow speed heavy duty drilling machine fixed with mixing paddle. The mix will have a working time of 15 min.
- Apply the mortar using trowel to the all potholes ensuring that the mortar "wets" the surface by trowelling in firmly, leaving the surface proud.
- After 15 minutes, finish off with wet sponge or sponge float.

Surface Consolidation ..... All corners and adjacent wall up to 300mm shall be consolidated using polymer modified mortar as follows:-

- Mix WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin binder coat and spread the mix over the surface with brush (thickness not more than 2mm).
- Over wet binder coat, consolidate the vertical wall surfaces using polymer modified mortar at 8-10mm thick in CM 1:4 admixed with WPM 405 at a dosage of 1 Ltr per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate.
- All corners shall be finished with half round or fillet in shape.
- The applied plastered surface shall be allowed to cure and dry completely for 7 days.

Priming..... All surfaces shall be primed using WPM 240, single component; solvent based bitumen primer using good quality of roller / brush and allowed to dry completely. Coverage shall be at 5-6 Sqm per Ltr. Actual coverage depends on the substrate porosity.

Waterproofing Detail ..... All waterproof membrane detailing shall be carried out strictly in accordance with professional working practices for the installation of sheet/liquid membranes and in accordance with ARDEX ENDURA recommendations.

Waterproofing

Membrane..... Install a layer of WPM 3000 XC, over the RCC floor surfaces from the lowest point to enable laps to shed water. All edge and end laps must be overlapped minimum of 60mm and 100mm respectively. All end laps and exposed edges shall be sealed.

There will be significant additional stresses at this corner and these must be accommodated by installing an extra 300 mm wide membrane at all corners. The membrane shall be installed on all terrace floor area including 300mm high in the adjacent wall.

Membrane Termination ..... The waterproofing membrane shall be terminated on the wall surface using aluminium pressure bars and Hilti anchor screws. The edges shall be sealed by using SU 10, finishing flush with the surface.

Area 5.....Landscape areas

The main features /benefits of this system are:

- Waterproof, quick and easy install.
- Bitumen/Asphalt compound modified with SBS and high tack resin.
- Membrane self seals on any punctures maintaining its water tightness.
- Positive vapour barrier.
- Excellent Elongation.
- Accommodate structural movements.
- Membrane will adapt easily to irregularly shaped surfaces, and will stretch without breaking or cracking.
- The protective polymer film is highly resistant to acids alkalis and other pollutants.
- Installed without use of open flames.
- Ideal for installation in restricted spaces.
- The membrane can be adjusted, if initially placed in the wrong position, as the adhesive on the sheet achieves final adhesion only after a few minutes.

Specification details

System Proposed: SBS, self-adhesive sheet membrane made from two structural components, bitumen/asphalt compound modified with SBS and high tack resin over bitumen modified solvent – based primer coat.

Products Specified And Descriptions:

A 46: Rapid setting and rapid hardening external repair mortar. The properties as are follows:-

- Bulk density of powder : Approx 1.3 Kg / Ltr
- Weight of fresh mortar : Approx 1.8 Kg / Ltr
- Working time : 15 min
- Walkable : 2-3 hrs
- Application thickness : 2-30mm
- Compressive Strength : After 28 days 20.0 N/mm²
- Tensile Bending Strength : After 28 days 6.0 N/mm²
- Freeze thaw and salt resistant : yes
- Suitable for underfloor heating : yes

WPM 256: Two components water based epoxy polyamide act as high strength bonding bridge solution and admixture.

WPM 405: SBR based, multipurpose, concentrated, liquid polymer additive, which when used with sand/cement, greatly improves the bond strength and flexibility. The properties are as follows:-

- pH : 9 – 10
- Tensile adhesion over concrete(7 days) : 1.5 Mpa
- Hydrostatic pressure resistance : 50 psi(0.34 Mpa)
- As additive to screed Flexural strength : 3.3 Mpa

WPM 240: Bitumen modified solvent-based primer coat.

WPM 3000 X: It is a peel and stick bituminous/asphalt membrane protected by a cross-laminated, high-density polyethylene film. It is made from two structural components. Bitumen/asphalt compound modified with SBS and high tack resins. The properties of membranes are:-

- Thickness as per UNI 8202 : 1.5 mm
- Weight as per UNI 8202 : 1.6 kg/m^2
- Tensile strength long as per ASTM D 638 : 4.35 N/mm
- Tensile strength trans as per ASTM D 638 : 5.69 N/mm
- Longitudinal elongation of membrane as per ASTM D 638 : 435%

- Transverse elongation of membrane as per ASTM D 638 : 380%
- Tearing resistance long as per 8202/9 : 83.01 N
- Tearing resistance as per 8202/9 : 73.74 N
- Adhesion to primed concrete as per ASTM D 1000 : 4.9N/mm
- Adhesion to steel as per ASTM D 1000 : 5.8N/mm
- Puncture resistance as per ASTM E 154 : 246N/65mm
- Vapour transmission rate as per ASTM E 96 : 0.3g/m^2/24 Hrs
- Cold flexibility as per ASTM D 146 : -30^{0}C
- Environment resistance ASTM D 543 : Conforms

SU 10: Polyurethane based highly flexible sealant. The properties of cured sealant are as follows:-

- Hardness Shore A-DIN 53 505 : 20 - 25
- Modulus at 100% ISO 8339 : 0.20 - 0.25 Mpa
- Elongation at Break ISO 8339 : 250%
- Elastic recovery ISO 7389 : > 70%
- Water vapour Diffusion NFT 30018 : 32g/m^2/24 hrs
- Movement Capability : 25%

<u>Treatment Methodology:</u>

Scope ..... Landscaping areas

Substrate ..... RCC

Surface Preparation ..... All floor and wall surfaces up to required height shall be made free from all debris, dust, dirt and other contaminants. All sharp protrusions shall be grinded and made level with the surface. Newly laid structures shall be allowed to cure and dry completely. The slab shall be finished smooth steel trowel finish with proper slope towards the outlet pipes.

Waterproofing Detail ..... All waterproof membrane detailing shall be carried out strictly in accordance with professional working practices for the installation of

sheet/liquid membranes and in accordance with ARDEX ENDURA recommendations.

Potholes Filling ..... All potholes shall be filled as follows:-

- Mix the 3 part of powder of A 46 to 1 part of clean water in mixing vessel and mix thoroughly to obtain lump free and slump resistant mortar using slow speed heavy duty drilling machine fixed with mixing paddle. The mix will have a working time of 15 min.
- Apply the mortar using trowel to the all potholes ensuring that the mortar "wets" the surface by trowelling in firmly, leaving the surface proud.
- After 15 minutes, finish off with wet sponge or sponge float.

Construction joints

Treatment ..... All construction joints shall be treated using epoxy modified mortar as follows:-

- Cut open the construction joints by making groove in the form of "V" shape at required size.
- Clean the grooves and 75mm wide at both side of the joint to make it free from all dirt, dust and other contaminants.
- Apply neat coat of WPM 256 in and around the groove.
- Apply epoxy modified mortar of CM 1:3 admixed with WPM 256 at dosage of 1 Ltr per bag of 50 Kg cement over the wet neat coat of WPM 256.
- Finish the surface with neat steel trowel flush with the surface.
- Allow the applied mortar to cure and dry completely.

Coving Installation ..... Coving shall be installed at all corners using polymer modified mortar as follows:-

- Apply binder coat of WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin slurry and spread the mix over the surface with brush (thickness not more than 2mm).
- Install the polymer modified mortar over wet binder coat, at all corners in required size in half round or fillet in shape using

CM 1:4 admixed with WPM 405 at a dosage of 1 Ltr per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate.

- The installed coving shall be allowed to cure and dry completely for 7 days.

Priming..... All surfaces shall be primed using WPM 240, single component; solvent based bitumen primer using good quality of roller / brush and allowed to dry completely. Coverage shall be at 5-6 Sqm per Ltr. Actual coverage depends on the substrate porosity.

Waterproofing Membrane..... There will be significant additional stresses at all corners and these must be accommodated by reinforcing with 300mm wide WPM 3000 X. WPM 3000 X shall be installed to all floor and walls of landscaping area from the lowest point to enable laps to shed water. All edge and end laps must be overlapped minimum of 60mm and 100mm respectively. All end laps and exposed edges shall be sealed.

All rolls of WPM 3000 X are marked with a 60mm line.

Note ..... **Under any circumstances, the membrane shall not be left exposed to sun / UV light for long time.**

Membrane Protection..... The applied WPM 3000 X shall be protected by installing 4mm thick PVC boards and shall be placed in position using Duct Tape (PVC Tape) or similar.

Membrane Termination..... Terminate the edge of the membranes on to the retaining wall by fixing aluminium pressure bars using anchor nails and apply SU 10 making flush with the surface. Allow the applied sealant to dry completely.

Note ..... **Subsequent civil works like installation of the drainage cells, Geo textile and earth filling shall be carried out with proper care not to damage the waterproofing membranes.**

Area 6.....Swimming pool & water bodies

The main features /benefits of this system are:

- Two components waterproofing membrane system designed for long lasting results.
- Excellent elongation and tensile strength (Elongation 333% as per AS 1145, tensile strength 2.9 MPa as per AS1145)
- Liquid reinforced: Excellent strength
- The addition of epoxy polyamide membrane as a barrier coat will enhance the performance.
- Thermoplastic elstomer, special coated non-woven at all corners.
- Single component, polyurethane, flexible sealant.

Specification details

System proposed: Two components advanced acrylic, modified, synthetic micro fibre reinforced membrane formulated to provide a tough, long lasting waterproofing system over water based epoxy polyamide moisture barrier coat.

Products Specified And Descriptions:

WPM 256: Two component water based epoxy polyamide new to old concrete bonding bridge. A relatively high solids product specifically designed as a high strength bonding bridge for bonding new render or concrete to aged concrete substrates.

SU 10: Polyurethane based highly flexible sealant. The properties of cured sealant are as follows:-

- Hardness Shore A-DIN 53 505 : 20 - 25
- Modulus at 100% ISO 8339 : 0.20 - 0.25 Mpa
- Elongation at Break ISO 8339 : 250%
- Elastic recovery ISO 7389 : > 70%
- Water vapour Diffusion
  NFT 30018 : 32g/m^2/24 hrs
- Movement Capability : 25%

WPM 300: Two components, water based epoxy polyamide barrier coating, which prevents rising dampness and the formation of efflorescence when used as single coat barrier coat.

WPM 002: Is two components cement based advanced acrylic modified waterproofing membrane, tough, ready to use, fast drying, and specifically designed for use in sandwiched situations. The product has been uniquely formulated with synthetic micro fibers to increase its strength. The properties are as follows:-

- Elongation at Break @ 7 days dry AS1145 : 332%
- Tensile Strength @ 7 days dry AS1145 : 1.7 MPa
  @Full Cure 28 days : 2.9 MPa
- Water Absorption AS A121 App K : 4.3%
- Shore A hardness - ASTM D2240 : Dry film 85 – 90
  : Wet film 75 - 80

WPM Deck Web: Non-Woven polyester glass filament reinforced reinforcing cloth of 50 Gsm. The properties are as follows:-

- Tensile strength at break : MD 160 daN/5cm(Avg) 120 daN/5cm(Min)
  CD 35 daN/5cm(Avg) 20 daN/5cm (Min)
- Elongation at break : MD 16% (Avg) 11%(Min)
  CD 40%(Avg) 28%(Min)

Sealing Tape 28533: Thermoplastic elstomer, special coated non-woven: elastic in cross direction and rigid lengthwise, extremely thin, high tenacity for corner treatment in swimming pools. The properties are as follows:-

- Length Per Roll : 50 m
- Width Total : 240 mm
- Width of the coating : 120 mm

- Total Thickness : approx. 0.5 mm
- Material weight : approx. 24 g/m
- Coating : Thermoplastic elastomer, resistant to ageing
- Coating Colour : Grey
- Surface : Structure embossing
- Adhesive Agent : Applied on top of the whole surface
- Non-woven : No wicking/ Capillarity effect
- Chemical Resistance : Certificates upon request
- Product in water impermeable : tested and approved by competent agency
- Burst Pressure : 2.00 bar
- Elasticity lateral by 25% : 0.40 N/mm
- Elasticity lateral by 50% : 0.80 N/mm
- Elasticity lateral until break : 144.00 %
- Peeling Resistance : 10 N/10 mm
- Ozone Resistance : Resistant (DIN 53509 Part 1=ISO 1431-1) : (evaluation level 0) Ozone quantity (200± 20) pphm
- Resistant to water pressure : Resistant (1.5 bar)
- UV- Resistance : Resistant (200 h, 254-360 nm) (Evaluation level 3-4)
- Resistance to Temperature : (-30^{0}C to + 90^{0}C)

WPM 405: SBR based, multipurpose, concentrated, liquid polymer additive, which when used with sand/cement, greatly improves the bond strength and flexibility. The properties are as follows:-

- pH : 9 – 10
- Tensile adhesion over concrete(7 days) : 1.5 Mpa
- Hydrostatic pressure resistance : 50 psi(0.34 Mpa)
- As additive to screed Flexural strength : 3.3 Mpa

<u>Treatment Methodology:</u>

Scope ..... Swimming pools / water bodies

Substrate ..... RCC

Surface Preparation ..... All surfaces of floor, wall, wall topping and drains (if any) shall be cleaned to make it free from all dirt, dust, debris, laitance and other contaminants by mechanical means and wire brushing. All sharp edges and protrusions shall be grinded to make them flush with the surface. All new surfaces shall be allowed to cure and dry completely according to standard practice.

Pressure grouting is to be done in order to prevent the leakage of water through voids present in the concrete, which will be filled completely, especially in the construction joints. Pressure grouting is to be carried out only in case of high amount of porosity in the concrete.

Pressure grouting..... The procedure will be as follows:

- Drill 12mm diameter holes in the concrete using pneumatic drill in a grid pattern at required spacing as per the site conditions but in no case exceeding 1mtr.
- The depth of the drilling shall be adequate to pump the grout to the intended locations in predetermined areas.
- PVC/GI nozzles shall be fixed in the holes drilled using a fast setting compound.
- Expansive Additive admixed with neat cement to achieve a uniform mix. Water shall be added to achieve required consistency
- The grout obtained thus is then injected under a pressure of 40psi grout pump to fill all possible pores and gaps left within the concrete mass. When the flow of grout stops, or when the grout flows out of the adjacent nozzles, pumping is stopped and the nozzle is tied up and allowed to set for 24 hours.
- The grouting holes shall be finished by removing the nozzles and finishing flush with the surface using A 46 mortar.

Waterproofing Detail ..... All waterproof membrane detailing shall be carried out strictly in accordance with professional working practices for the installation of Liquid / sheet membranes and in accordance with ARDEX ENDURA recommendations.

Construction joints

Treatment ..... All construction joints shall be treated using epoxy modified mortar as follows:-

- Cut open the construction joints by making groove in the form of "V" shape at required size.
- Clean the grooves and 75mm wide at both side of the joint to make it free from all dirt, dust and other contaminants.
- Apply neat coat of WPM 256 in and around the groove.
- Apply epoxy modified mortar of CM 1:3 admixed with WPM 256 at dosage of 1 Ltr per bag of 50Kg cement over the wet neat coat of WPM 256.
- Finish the surface with neat steel trowel flush with the surface.
- Allow the applied mortar to cure and dry completely.

Coving Installation ..... Coving shall be installed at all corners using polymer modified mortar as follows:-

- Apply binder coat of WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin slurry and spread the mix over the surface with brush (thickness not more than 2mm).
- Install the polymer modified mortar over wet binder coat, at all corners in required size in half round or filler in shape using CM 1:4 admixed with WPM 405 at a dosage of 1 Ltr per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate.
- The installed coving shall be allowed to cure and dry completely for 7 days.

Sealant

Application ..... A bead of SU 10 shall be applied at pipe penetrations and cracks (if any) by making the grooves in the form of "V" shape and allowed to dry completely.

Moisture Barrier Coat ..... **Mixing:** WPM 300 is a 2 components product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using heavy duty slow speed drilling machine fixed with mixing paddle to obtain a uniform mix.

Application: All surfaces to which the waterproofing membrane is to be installed shall be primed using WPM 300 in one coat at coverage of $3m^2$ per Ltr. Allow the surface of WPM 300 to dry completely.

Waterproofing Membrane..... **Mixing:** WPM 002 is a two components product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using heavy duty slow speed drilling machine fixed with mixing paddle to obtain a uniform mix.

Two coats of WPM 002 are required to achieve the correct dry film thickness of 1.00mm. Apply the first coat over the primed surface. Install the WPM Deck web at all pipe penetrations / construction joints and Sealing tape 28533 at all corners over the wet surface of WPM 002 ensuring the WPM Deck web and Sealing tape 28533 is completely embedded in the coat of WPM 002 and allowed to dry (4 hours at 23°C, 50% RH). Apply the second coat of WPM 002 in opposite direction to the first coat and allow it to dry completely.

Application Brush / Roller recommended: (A medium nap (8-12 mm pile) paint roller is recommended.) New rollers should be dampened with water before being used for the first time. For best results with a paint brush use a good quality, 50mm long bristle variety.

Installation Quality ..... It is critical that the application of 2nd coat over the 1st coat should be in right angle to that of 1st coat and the time gap of minimum 4 hours between the 1st and 2nd coat should be maintained strictly. Subsequent applications shall be carried out after 24 hrs followed by the application of 2nd coat of WPM 002.

Protection Plaster ..... **Binder coat:** Mix WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin slurry and spread the mix over the surface with brush (thickness not more than 2mm).

Plastering: Over wet binder coat, plaster to all waterproofed surfaces using polymer modified mortar at 12-15 mm thick in CM 1:4 admixed with WPM 405 at a dosage of 1 liter per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a

good contact with the substrate. The applied plastered surface shall be allowed to cure for 7 days and allowed to dry completely.

Tiling and grouting ..... Tile as per requirement of client, shall be installed using recommended ARDEX ENDURA Adhesive by maintaining the joints gap of minimum 3mm to accommodate the movement. Tile joints shall be grouted using ARDEX ENDURA EPOXY GROUT after the complete drying time of the adhesive.

Area 7.....OHT - Over head Tank

The main features/benefits of this system are:

- Can be applied to damp surfaces.
- Can be safely applied to freshly laid hardened (green) concrete.
- Epoxy polyamide membrane as a barrier coat will enhance the performance
- The cured membrane will withstand 400 kPa hydrostatic pressure which is equivalent to a 40 metre head of water.
- Has excellent adhesion to most substrates including brick, masonry, concrete block, concrete, stone and timber.
- Conforms to the requirements of AS4020 and BS6920 for use in contact with potable water.

Specification details

System Proposed: Hydrepoxy, water based epoxy polyamide un-pigmented sealer, water based epoxy polyamide potable grade waterproofing membrane.

Products Specified And Descriptions:

WPM 256: Two components water based epoxy polyamide act as high strength bonding bridge solution and admixture.

WPM 405: SBR based, multipurpose, concentrated, liquid polymer additive, which when used with sand/cement, greatly improves the bond strength and flexibility. The properties are as follows:-

- pH : 9 – 10
- Tensile adhesion over concrete(7 days) : 1.5 Mpa
- Hydrostatic pressure resistance : 50 psi(0.34 Mpa)

- As additive to screed Flexural strength : 3.3 Mpa

WPM 200: Two components, water based epoxy polyamide un-pigmented sealer, binder used for sealing surfaces and providing a strong bond to difficult or improperly prepared surfaces.

WPM 300: Is two components, water based epoxy polyamide based waterproofing membrane. The properties of the membrane are:-

- Conforms to the requirements of AS4020 and BS6920 for use in contact with potable water.
- When applied directly to the substrate the cured membrane will withstand 250 kPa hydrostatic pressure which is equivalent to a 25 metre head of water.
- Volume of solids : 44%
- Finish : Semi-gloss going to matt with aging
- Recoat time : 2 hrs @ 25^0C & 50% RH
- Full cure : 7 days @ 25^0C & 50% RH
- Pot life : 2 hrs @ 25^0C & 1 hrs @ 35^0C

<u>Treatment Methodology:</u>

Scope ..... OHT

Substrate ..... RCC

Surface Preparation ..... All internal areas of floor and walls of OHT shall be cleaned to make it free from all dirt, dust and other contaminants shall be removed completely. All sharp edges and protrusions shall be grinded to make them flush with the surfaces.

Pressure grouting is to be done in order to prevent the leakage of water through voids present in the concrete, which will be filled completely, especially in the construction joints. Pressure grouting is to be carried out only in case of high amount of porosity in the concrete.

Pressure grouting..... The procedure will be as follows:

- Drill 12mm diameter holes in the concrete using pneumatic drill in a grid pattern at required spacing as per the site conditions but in no case exceeding 1mtr.
- The depth of the drilling shall be adequate to pump the grout to the intended locations in predetermined areas.

- PVC/GI nozzles shall be fixed in the holes drilled using a fast setting compound.
- Expansive Additive admixed with neat cement to achieve a uniform mix. Water shall be added to achieve required consistency
- The grout obtained thus is then injected under a pressure of 40psi grout pump to fill all possible pores and gaps left within the concrete mass. When the flow of grout stops, or when the grout flows out of the adjacent nozzles, pumping is stopped and the nozzle is tied up and allowed to set for 24 hours.
- The grouting holes shall be finished by removing the nozzles and finishing flush with the surface using A 45 mortar.

Construction joints

Treatment ..... All construction joints shall be treated using epoxy modified mortar as follows:-

- Cut open the construction joints by making groove in the form of "V" shape at required size.
- Clean the grooves and 75mm wide at both side of the joint to make it free from all dirt, dust and other contaminants.
- Apply neat coat of WPM 256 in and around the groove.
- Apply epoxy modified mortar of CM 1:3 admixed with WPM 256 at dosage of 1 Ltr per bag of 50Kg cement over the wet neat coat of WPM 256.
- Finish the surface with neat steel trowel flush with the surface.
- Allow the applied mortar to cure and dry completely.

Surface Consolidation ..... **Binder coat:** Mix WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin slurry and spread the mix over the surface with brush (thickness not more than 2 mm).

Plastering: Over wet binder coat, plaster to all waterproofed surfaces using polymer modified mortar at 12-15 mm thick in CM 1:4 admixed with WPM 405 at a dosage of 1 liter per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate. All corners shall be finished with half

round or fillet in shape. The applied plastered surface shall be allowed to cure for 7 days and allowed to dry completely.

Mixing ..... **WPM 200** is a 2 components product consisting of Part A and Part B which needs to be mixed in 1:1 ratio using heavy duty electric slow speed drill with necessary mixing paddle, to achieve a uniform mix before applying.

WPM 300 is a 2 components product consisting of Part A and Part B which needs to be mixed in 1:1 ratio using heavy duty electric slow speed drill with necessary mixing paddle, to achieve a uniform mix before applying.

Sealer and Hydrostatic Pressure Resistant Coat..... Apply hydrostatic pressure resistant, potable grade membranes to floor, and wall surfaces as follows:-

- Apply a coat of WPM 200 in 1 coat at coverage of 5 Sqm per litre. WPM 200 shall be applied liberally in order to seal the surface completely.
- Apply first coat of WPM 300 in one coat whilst the WPM 200 is still wet (to form a wet on wet application) at coverage of 3 m^2 and allow it to dry complete to touch dry.
- Apply second coat over the dried coat of WPM 300 and allow it to dry completely.
- Thickness of WPM 300 shall be of 300 micron.
- Water can be filled after the complete 7 days curing.

Note ..... ***WPM 300, Hydrepoxy dries in two stages – the first being water evaporation which requires good ventilation. It is advisable in a closed tanking situation to provide forced ventilation to expedite the drying process. Failure to allow the coats to thoroughly dry prior to subsequent application will lead to water retention and blistering. The proposed system is a semi rigid membrane and cannot cope up with the subsequent crack development of concrete.***

Area 8.....Expansion joints

The Expansion joints shall be treated depending on where they are located.

Location 1 .. Terrace area exposed waterproofing treatment.

Location 2 .. Terrace area protected grade waterproofing treatment.

Location 3 .. Internal floor

Location 4 .. Internal wall and ceiling areas

Location 5 .. External wall areas

Location 1.....Terrace area exposed waterproofing treatment.

The main features/benefits of this system are:

- Tough, UV stable, mildew resistant and flexible results liquid applied waterproofing membrane.
- The addition of epoxy polyamide membrane as a sealer and barrier coat will enhance the performance.
- Thermoplastic elastomer coated non-woven: excellent extension in cross direction and rigid lengthwise.
- Highly flexible polyurethane sealant.

Specification details

System Proposed: Polyurethane based highly flexible sealant for sealing the expansion joints; thermoplastic elastomer coated, non-woven, sandwiching between 2 coats of cementitious acrylic modified waterproofing membrane over water based epoxy polyamide primer.

Products Specified And Descriptions:

A 46: Rapid setting and rapid hardening external repair mortar. The properties as are follows:-

- Bulk density of powder : Approx 1.3 Kg / Ltr
- Weight of fresh mortar : Approx 1.8 Kg / Ltr

- Working time : 15 min
- Walkable : 2-3 hrs
- Application thickness : 2-30mm
- Compressive Strength : After 28 days 20.0 N/mm²
- Tensile Bending Strength : After 28 days 6.0 N/mm²
- Freeze thaw and salt resistant : yes
- Suitable for underfloor heating : yes

SU 10: Polyurethane based highly flexible sealants for expansion joints. The properties of cured sealant are as follows:-

- Hardness Shore A-DIN 53 505 : 20 - 25
- Modulus at 100% ISO 8339 : 0.20 - 0.25 Mpa
- Elongation at Break ISO 8339 : 250%
- Elastic recovery ISO 7389 : > 70%
- Water vapour Diffusion
  NFT 30018 : 32g/ m^2/24 hrs
- Movement Capability : 25%

WPM 300: Two components, water based epoxy polyamide moisture barrier coating, which prevents rising damp and the formation of efflorescence when used as single coat.

WPM 350: Is two components cementitious acrylic modified waterproofing membrane, tough, UV resistant, ready to use, fast drying, and specifically designed for use exposed situations. The products have been uniquely formulated with synthetic microfibers to increase its strength. The properties are as follows:-

- Form & Colour : liquids - Various colour
- Specific Gravity : Approx. 1.06 kg/litre
- Bulk Density : Approx. 1.4 kg/litre
- Water absorption AS Al 21 : App K 5%
- Tensile Strength AS 1145
  - 28 days dry : 1.97 MPa
  - after UV exposure : 2.32 MPa
- Elongation at Break - AS 1145
  - 28 days dry : 208%
  - after UV exposure : 155%

- Movement joint test CSIRO : Pass
- Overcoat time : 4 hrs @ 23°C 50% RH
- Pot life : 3 hrs @ 23°C 50% RH

Sealing Tape 29200: - Thermoplastic elastomer coated non-woven: excellent extension in cross direction and rigid lengthwise, strong, high tenacity, special flexible zone in the middle. The properties of Sealing Tape are as follows:-

- Color : Grey
- Total width / Coating width : 220 mm / 180 mm + 50 mm
- Coating thickness (approx) : 1.5 mm
- Material weight (approx.) : 188 g / m
- Resistance to temperature : min - 30°C / max + 90°C
- Length per roll : 30 mtr
- Burst pressure : max Internal 2.4 bar
- Breaking load longitudinal (only flexible zone) : DIN EN ISO 527-3 51 N / 15 mm
- Breaking load longitudinal : DIN EN ISO 527-3 190 N / 15 mm
- Breaking load lateral : DIN EN ISO 527-3 51 N / 15 mm
- Extension break longitudinal (only flexible zone) : DIN EN ISO 527-3 284 %
- Extension break longitudinal : DIN EN ISO 527-3 38 %
- Extension break lateral : DIN EN ISO 527-3 426 %
- Power absorption at 25% Elasticity lateral : DIN EN ISO 527-3 0.9 N / mm
- Power absorption at 50% Elasticity lateral : DIN EN ISO 527-3 1.0 N / mm
- Resistance to water pressure : DIN EN 1928 (Version B)> 3 bar
- UV-Resistance: min. : DIN EN ISO 4892-3 2480 h

<u>Treatment Methodology:</u>

Scope ..... Expansion joints at terrace areas (6 to 40mm wide only)

Substrate ..... Cement concrete / Reinforced Concrete

Surface Preparation ..... All inner surfaces of the expansion joints including 150mm wide on the both sides of the joint shall be cleaned to make it free from all dirt, dust and other contaminants. Loosely bonded particles and weak substrate shall be removed completely.

Edge Preparation ..... All damaged edges and inner surface of the expansion joints shall be made good using A 46 as follows:-

- Mix the 3 part of powder of A 46 to 1 part of clean water in mixing vessel and mix thoroughly to obtain lump free and slump resistant mortar using slow speed heavy duty drilling machine fixed with mixing paddle. The mix will have a working time of 15 min.
- Apply the mortar using trowel to the edge ensuring that the mortar "wets" the surface by trowelling in firmly, leaving the edge proud.
- After 15 minutes, trim excess mortar, and finish off with wet sponge or sponge float.

Backer Rod Installation ..... Install polystyrene backer rod in the expansion joint leaving required depth from the top to fill the sealant. The backer rod shall be installed in such a way that, the depth shall be equal to the width, if the width of the joint is lesser equal to 10mm, and for width of the joint above 10mm, depth shall be maintained half of its width.

Moisture Barrier Coat ..... The application of the moisture barrier coat is as follows:-

- WPM 300 is a 2 components product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using heavy duty slow speed drilling machine fixed with mixing paddle to obtain a uniform mix.
- All inner surfaces including 150mm wide on both sides of the joints shall be primed using WPM 300 in one coat at coverage of 3 Sqm per Ltr.

Sealant Installation ..... Install SU 10, in the expansion joints finishing flush with the surface. Allow the applied SU 10 to dry completely.

Waterproofing

Membrane..... Mixing: WPM 350 is a two components product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using heavy duty slow speed drilling machine fixed with mixing paddle to obtain a uniform mix.

Two coats of WPM 350 are required to achieve the correct dry film thickness of 1.50mm. Apply the first coat over the primed surface. Install the Sealing tape 29200 on wet surface of WPM 350 ensuring the Sealing tape 29200 is completely embedded in the coat of WPM 350 and allowed to dry (4 hours at 23°C, 50% RH). Apply the second coat of WPM 350 in opposite direction to the first coat and allow it to dry completely.

Application Brush / Roller recommended: (A medium nap (8-12 mm pile) paint roller is recommended.) New rollers should be dampened with water before being used for the first time. For best results with a paint brush use a good quality, 50mm long bristle variety.

Joints Protection..... Even though WPM 350 is exposed grade waterproofing membrane, it has to be protected from sharp object and foot traffics by brick and tile encasement.

Location 4..... Terrace area protected grade waterproofing treatment.

The main features/benefits of this system are:

- Two components waterproofing membrane system designed for long lasting results.
- Excellent elongation and tensile strength (Elongation 333% as per AS 1145, tensile strength 2.9 MPa as per AS1145)
- Liquid reinforced: Excellent strength
- The addition of epoxy polyamide membrane as a barrier coat will enhance the performance.
- Single component, polyurethane, flexible sealant.

Specification details

System Proposed: Polyurethane based highly flexible sealant for sealing the expansion joints; thermoplastic elastomer coated, non-woven, sandwiching between 2 coats of cementitious acrylic modified waterproofing membrane over water based epoxy polyamide primer.

Products Specified And Descriptions:

A 46: Rapid setting and rapid hardening external repair mortar. The properties as are follows:-

- Bulk density of powder : Approx 1.3 Kg / Ltr
- Weight of fresh mortar : Approx 1.8 Kg / Ltr
- Working time : 15 min
- Walkable : 2-3 hrs
- Application thickness : 2-30mm
- Compressive Strength : After 28 days 20.0 N/mm²
- Tensile Bending Strength : After 28 days 6.0 N/mm²
- Freeze thaw and salt resistant : yes
- Suitable for underfloor heating : yes

SU 10: Polyurethane based highly flexible sealants for expansion joints. The properties of cured sealant are as follows:-

- Hardness Shore A-DIN 53 505 : 20 - 25
- Modulus at 100% ISO 8339 : 0.20 - 0.25 Mpa
- Elongation at Break ISO 8339 : 250%
- Elastic recovery ISO 7389 : > 70%
- Water vapour Diffusion
  NFT 30018 : 32g/ m^2/24 hrs
- Movement Capability : 25%

WPM 300: Two components, water based epoxy polyamide moisture barrier coating, which prevents rising damp and the formation of efflorescence when used as single coat.

WPM 002: Is two components advanced acrylic cementitious modified waterproofing membrane, tough, ready to use, fast drying, and specifically designed for use in sandwiched situations. The product has been uniquely formulated with synthetic micro fibers to increase its strength. The properties are as follows:-

- Elongation at Break @ 7 days dry AS1145 : 332%
- Tensile Strength @ 7 days dry AS1145 : 1.7 MPa
  @Full Cure 28 days : 2.9 MPa
- Water Absorption AS A121 App K : 4.3%
- Shore A hardness - ASTM D2240 : Dry film 85 – 90
  : Wet film 75 - 80

Sealing Tape 29200: - Thermoplastic elastomer coated non-woven: excellent extension in cross direction and rigid lengthwise, strong, high tenacity, special flexible zone in the middle. The properties of Sealing Tape are as follows:-

• Color	:	Grey	
• Total width / Coating width	:	220 mm / 180 mm + 50 mm	
• Coating thickness (approx)	:	1.5 mm	
• Material weight (approx.)	:	188 g / m	
• Resistance to temperature	:	min - 30°C / max + 90°C	
• Length per roll	:	30 mtr	
• Burst pressure	:	max Internal 2.4 bar	
• Breaking load longitudinal (only flexible zone)	:	DIN EN ISO 527-3	51 N / 15 mm
• Breaking load longitudinal	:	DIN EN ISO 527-3	190 N / 15 mm
• Breaking load lateral	:	DIN EN ISO 527-3	51 N / 15 mm
• Extension break longitudinal (only flexible zone)	:	DIN EN ISO 527-3	284 %
• Extension break longitudinal	:	DIN EN ISO 527-3	38 %
• Extension break lateral	:	DIN EN ISO 527-3	426 %
• Power absorption at 25% Elasticity lateral	:	DIN EN ISO 527-3	0.9 N / mm
• Power absorption at 50% Elasticity lateral	:	DIN EN ISO 527-3	1.0 N / mm
• Resistance to water pressure	:	DIN EN 1928 (Version B)> 3 bar	
• UV-Resistance: min.	:	DIN EN ISO 4892-3	2480 h

Treatment Methodology:

Scope ..... Expansion joints at terrace areas (6 to 40mm wide only)

Substrate ..... Cement concrete / Reinforced Concrete

Surface Preparation ..... All inner surfaces of the expansion joints including 150mm wide on the both sides of the joint shall be cleaned to make it free from all dirt, dust and other contaminants. Loosely bonded particles and weak substrate shall be removed completely.

Edge Preparation ..... All damaged edges and inner surface of the expansion joints shall be made good using A 46 as follows:-

- Mix the 3 part of powder of A 46 to 1 part of clean water in mixing vessel and mix thoroughly to obtain lump free and slump resistant mortar using slow speed heavy duty drilling machine fixed with mixing paddle. The mix will have a working time of 15 min.
- Apply the mortar using trowel to the edge ensuring that the mortar "wets" the surface by trowelling in firmly, leaving the edge proud.
- After 15 minutes, trim excess mortar, and finish off with wet sponge or sponge float.

Backer Rod Installation ..... Install polystyrene backer rod in the expansion joint leaving required depth from the top to fill the sealant. The backer rod shall be installed in such a way that, the depth shall be equal to the width, if the width of the joint is lesser equal to 10mm, and for width of the joint above 10mm, depth shall be maintained half of its width.

Moisture Barrier Coat ..... The application of the moisture barrier coat is as follows:-

- WPM 300 is a 2 components product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using heavy duty slow speed drilling machine fixed with mixing paddle to obtain a uniform mix.
- All inner surfaces including 150mm wide on both sides of the joints shall be primed using WPM 300 in one coat at coverage of 3 Sqm per Ltr.

Sealant Installation ..... Install SU 10, in the expansion joints finishing flush with the surface. Allow the applied SU 10 to dry completely.

Waterproofing Membrane..... **Mixing:** WPM 002 is a two components product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using heavy duty slow speed drilling machine fixed with mixing paddle to obtain a uniform mix.

Two coats of WPM 002 are required to achieve the correct dry film thickness of 1.00mm. Apply the first coat over the primed surface. Install the Sealing tape 29200 on wet surface of WPM 350 ensuring the Sealing tape 29200 is completely embedded in the coat of WPM 350 and allowed to dry (4 hours at 23°C, 50% RH). Apply the second coat of WPM 002 in opposite direction to the first coat and allow it to dry completely.

Application Brush / Roller recommended: (A medium nap (8-12 mm pile) paint roller is recommended.) New rollers should be dampened with water before being used for the first time. For best results with a paint brush use a good quality, 50mm long bristle variety.

Protection To

Waterproofing Treatment .. All waterproofed treatment shall be protected by installing protection plaster or tiling and grouting. Expansion joint width shall be maintained properly for the final termination.

Sealant Installation ..... After final protection plaster or tiling and grouting has been installed; install SU 10, in the expansion joints finishing flush with the surface. Allow the applied SU 10 to dry completely.

Location 3.....Internal floors

The main features/benefits of this system are:

- Non staining and can be paintable
- Adheres on majority of building substrate like concrete, plastered works, tiles, etc.

Specification details

System Proposed: Polyurethane based highly flexible sealant.

Products Specified And Descriptions:

A 45: Rapid setting and rapid hardening internal repair mortar. The properties as are follows:-

- Bulk density of powder : Approx 1.4 Kg / Ltr
- Weight of fresh mortar : Approx 1.9 Kg / Ltr
- Initial Set (Vicat) DIN 1164 : Approx 15 min
- Final Set (Vicat) DIN 1164 : Approx 60 min

- Receives finishes : After one and half hour
- Compressive Strength : After 28 days 40.0 N/mm²
- Flexural Strength : After 28 days 7.0 N/mm²

SU 10: Polyurethane based highly flexible sealants for expansion joints. The properties of cured sealant are as follows:-

- Hardness Shore A-DIN 53 505 : 20 - 25
- Modulus at 100% ISO 8339 : 0.20 - 0.25 Mpa
- Elongation at Break ISO 8339 : 250%
- Elastic recovery ISO 7389 : > 70%
- Water vapour Diffusion
  NFT 30018 : 32g/m^2/24 hrs
- Movement Capability : 25%

Treatment Methodology:

Scope ..... Expansion joints at internal floors. (6 to 40mm wide only)

Substrate ..... RCC and proposed floor finish

Surface Preparation ..... The waterproofing treatment for expansion joints shall be started only after the completion of final floor finishing, wall and ceiling finish. All inner surfaces of the expansion joints shall be cleaned to make it free from all dirt, dust and other contaminants. Loosely bonded particles shall be removed completely.

Edge Preparation ..... All damaged edges and inner surface of the expansion joints shall be made good using A 45 as follows:-

- Mix the 3 part of powder of A 45 to 1 part of clean water in mixing vessel and mix thoroughly to obtain lump free and slump resistant mortar using slow speed heavy duty drilling machine fixed with mixing paddle. The mix will have a working time of 15 min.
- Apply the mortar using trowel to the edge surface ensuring that the mortar "wets" the surface by trowelling in firmly, leaving the edge proud.
- After 15 minutes, trim excess mortar, and finish off with wet sponge or sponge float.

Backer Rod Installation ..... Install polystyrene backer rod in the expansion joint leaving required depth from the top to fill the sealant. The backer rod shall be installed in such a way that, the depth shall be equal to the width, if the width of the joint is lesser equal to 10mm, and for width of the joint above 10mm, depth shall be maintained half of its width.

Sealant Installation ..... The installation of the SU 10 is as follows:-

- Masking tape shall be installed at the edges of the expansion joints to protect the surfaces from sealant.
- Install SU 10, in the expansion joints finishing flush with the surface.
- Allow the applied SU 10 to dry completely and remove the masking tape.

Joints Protection ..... All Internal floor areas where foot traffic is high, the expansion joints shall be protected by using aluminium / stain less steel of ASM expansion joint protection Profile as per the structural consultants.

Location 4.....Internal wall and ceiling

The main features/benefits of this system are:

- Non staining and can be paintable
- Adheres on majority of building substrate like concrete, plastered works, tiles, etc.

Specification details

System Proposed: Polyurethane based highly flexible sealant.

Products Specified And Descriptions:

A 45: Rapid setting and rapid hardening internal repair mortar. The properties as are follows:-

• Bulk density of powder	:	Approx 1.4 Kg / Ltr	
• Weight of fresh mortar	:	Approx 1.9 Kg / Ltr	
• Initial Set (Vicat) DIN 1164	:	Approx 15 min	
• Final Set (Vicat) DIN 1164	:	Approx 60 min	
• Receives finishes	:	After one and half hour	
• Compressive Strength	:	After 28 days	40.0 N/mm²
• Flexural Strength	:	After 28 days	7.0 N/mm²

SU 10: Polyurethane based highly flexible sealants for expansion joints. The properties of cured sealant are as follows:-

- Hardness Shore A-DIN 53 505 : 20 - 25
- Modulus at 100% ISO 8339 : 0.20 - 0.25 Mpa
- Elongation at Break ISO 8339 : 250%
- Elastic recovery ISO 7389 : > 70%
- Water vapour Diffusion
  NFT 30018 : 32g/m^2/24 hrs
- Movement Capability : 25%

Treatment Methodology:

Scope ..... Expansion joints at internal wall and ceiling, (6 to 40mm wide only)

Substrate ..... Plastered wall surface.

Surface Preparation ..... All inner surfaces of the expansion joints shall be cleaned to make it free from all dirt, dust and other contaminants. Loosely bonded particles shall be removed completely.

Edge Preparation ..... All damaged edges and inner surface of the expansion joints shall be made good using A 45 as follows:-

- Mix the 3 part of powder of A 45 to 1 part of clean water in mixing vessel and mix thoroughly to obtain lump free and slump resistant mortar using slow speed heavy duty drilling machine fixed with mixing paddle. The mix will have a working time of 15 min.
- Apply the mortar using trowel to the edge surface ensuring that the mortar "wets" the surface by trowelling in firmly, leaving the edge proud.
- After 15 minutes, trim excess mortar, and finish off with wet sponge or sponge float.

Backer Rod Installation ..... Install polystyrene backer rod in the expansion joint leaving required depth from the top to fill the sealant. The backer rod shall be installed in such a way that, the depth shall be equal to the width, if the width of the joint is lesser equal to 10mm, and for width of the joint above 10mm, depth shall be maintained half of its width.

Sealant Installation ..... The installation of the SU 10 is as follows:-

- Masking tape shall be installed at the edges of the expansion joints to protect the surfaces from sealant.
- Install SU 10, in the expansion joints finishing flush with the surface.
- Allow the applied SU 10 to dry completely and remove the masking tape.
- The surface of the SU 10 shall be painted using good quality paints as per client requirement.

Location 5.....External wall areas

The main features/benefits of this system are:

- Water based epoxy polyamide moisture barrier coat.
- Water based acrylic waterproofing membrane, to prevent moistures, salt, fungi and algae growth on external surface.
- Highly flexible, durable UV resistant, and waterproof.
- Self cleaning and low dirt retention.
- Decorative and available in large range of durable colors.
- Vapor permeable (allow substrate to breath).
- Highly crack bridging.

Specification details

System Proposed: Extremely weather and UV resistant water based acrylic waterproofing membrane over water based epoxy polyamide moisture barrier coating.

Products Specified And Descriptions:

A 46: Rapid setting and rapid hardening external repair mortar. The properties as are follows:-

- Bulk density of powder : Approx 1.3 Kg / Ltr
- Weight of fresh mortar : Approx 1.8 Kg / Ltr
- Working time : 15 min
- Walkable : 2-3 hrs
- Application thickness : 2-30mm

- Compressive Strength : After 28 days 20.0 N/mm²
- Tensile Bending Strength : After 28 days 6.0 N/mm²
- Freeze thaw and salt resistant : yes
- Suitable for underfloor heating : yes

SU 10: Polyurethane based highly flexible sealants for expansion joints. The properties of cured sealant are as follows:-

- Hardness Shore A-DIN 53 505 : 20 - 25
- Modulus at 100% ISO 8339 : 0.20 - 0.25 Mpa
- Elongation at Break ISO 8339 : 250%
- Elastic recovery ISO 7389 : > 70%
- Water vapour Diffusion
  NFT 30018 : 32g/m^2/24 hrs
- Movement Capability : 25%

WPM 300: Two components, water based epoxy polyamide moisture barrier coating, which prevents rising damp and the formation of efflorescence when used as single coat.

WPM 310: WPM 310 is extreme weather and UV resistant water based acrylic waterproofing membrane, to prevent moistures salt fungi and algae growth on external surface. The technical properties are as follows:-

- Water Vapor Transmission (ASTM E96)at 1.0 mm : 21.9 g/ m^2/24hrs
- Tensile strength AS 1145
  - after 28 days dry : 2.1 MPa
  - after 14 days UV exposure : 3.0 MPa
  - after 2500 Hrs QUV : 5.9 MPa
- Elongation at break AS 1145
  - after 28 days dry : 460%
  - after 14 days UV exposure : 315%
  - after 2,500 Hrs QUV : 180%

<u>Treatment Methodology:</u>

Scope ..... Expansion joints at external walls. (6 to 40mm wide only)

Substrate ..... Plastered surfaces.

Surface Preparation ..... All inner surfaces of the expansion joints including 150mm wide on the both side of the joint shall be cleaned to make it free from all dirt, dust

and other contaminants. Loosely bonded particles and weak substrate shall be removed completely.

Edge Preparation ..... All damaged edges and inner surface of the expansion joints shall be made good using A 46 as follows:-

- Mix the 3 part of powder of A 46 to 1 part of clean water in mixing vessel and mix thoroughly to obtain lump free and slump resistant mortar using slow speed heavy duty drilling machine fixed with mixing paddle. The mix will have a working time of 15 min.
- Apply the mortar using trowel to the edge ensuring that the mortar "wets" the surface by trowelling in firmly, leaving the edge proud.
- After 15 minutes, trim excess mortar, and finish off with wet sponge or sponge float.

Backer Rod Installation ..... Install polystyrene backer rod in the expansion joint leaving required depth from the top to fill the sealant. The backer rod shall be installed in such a way that, the depth shall be equal to the width, if the width of the joint is lesser equal to 10mm, and for width of the joint above 10mm, depth shall be maintained half of its width.

Moisture Barrier Coat ..... The application of the moisture barrier coat is as follows:-

- WPM 300 is a 2 components product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using heavy duty slow speed drilling machine fixed with mixing paddle to obtain a uniform mix.
- All inner surfaces including 150mm wide on both sides of the joints shall be primed using WPM 300 in one coat at coverage of 3 m^2 per Ltr.

Sealant Installation ..... Install SU 10, in the expansion joints finishing flush with the surface. Allow the applied SU 10 to dry completely.

Facade Treatment ..... WPM 310 is a single component. Apply with a nap/textured roller or paint brush. Ensure that the coating is applied evenly at the recommended coverage rates. Apply the first coat of WPM 310 and allow it to dry. Apply the second coat of WPM 310. Time gap of

minimum 4 hours between the 1st and 2nd coat should be maintained strictly. The recommended coverage is 24 Sqm per 15 Ltr kit at DFT of 0.3mm.

Surfaces Finish ..... The surface finish achieved can be varied by selection of the method of application. Suitable roller should be selected to achieve the desired texture finish.

Drying..... The membrane will cure completely in 7 days, but initial dry of 4 hours (after the 2nd coat) is sufficient and after that the membrane shall be left exposed even to heavy rain.

Area 9.....Podium Slab

The main features /benefits of this system are:

- Waterproof, quick and easy install.
- Bitumen/Asphalt compound modified with SBS and high tack resin.
- Membrane self seals on any punctures maintaining its water tightness.
- Positive vapour barrier.
- Excellent Elongation.
- Accommodate structural movements.
- Membrane will adapt easily to irregularly shaped surfaces, and will stretch without breaking or cracking.
- The protective polymer film is highly resistant to acids alkalis and other pollutants.
- Installed without use of open flames.
- Ideal for installation in restricted spaces.
- The membrane can be adjusted, if initially placed in the wrong position, as the adhesive on the sheet achieves final adhesion only after a few minutes.

Specification details

System Proposed: SBS, self-adhesive sheet membrane made from two structural components, bitumen/asphalt compound modified with SBS and high tack resin. This special compound has been formulated to make the product easy to install.

Products Specified And Descriptions:

A 46: Rapid setting and rapid hardening external repair mortar. The properties as are follows:-

• Bulk density of powder	:	Approx 1.3 Kg / Ltr	
• Weight of fresh mortar	:	Approx 1.8 Kg / Ltr	
• Working time	:	15 min	
• Walkable	:	2-3 hrs	
• Application thickness	:	2-30mm	
• Compressive Strength	:	After 28 days	20.0 N/mm²
• Tensile Bending Strength	:	After 28 days	6.0 N/mm²
• Freeze thaw and salt resistant	:	yes	
• Suitable for underfloor heating	:	yes	

WPM 256: Two components water based epoxy polyamide act as high strength bonding bridge solution and admixture.

WPM 405: SBR based, multipurpose, concentrated, liquid polymer additive, which when used with sand/cement, greatly improves the bond strength and flexibility. The properties are as follows:-

- pH : 9 – 10
- Tensile adhesion over concrete(7 days) : 1.5 Mpa
- Hydrostatic pressure resistance : 50 psi(0.34 Mpa)
- As additive to screed Flexural strength : 3.3 Mpa

WPM 240: Bitumen modified solvent-based primer coat.

WPM 3000 X: Is a peel and stick bituminous/asphalt membrane protected by a cross-laminated, high-density polyethylene film. It is made from two structural components. Bitumen/asphalt compound modified with SBS and high tack resins. The properties of membranes are:-

The technical performance data are as follows:-

- Thickness as per UNI 8202 : 1.5mm
- Weight as per UNI 8202 : 1.6kg/ m^2
- Tensile strength long as per ASTM D 638 : 4.35N/mm
- Tensile strength trans as per ASTM D 638 : 5.69N/mm
- Longitudinal elongation of membrane as per ASTM D 638 : 435%
- Transverse elongation of membrane as per ASTM D 638 : 380%
- Tearing resistance long as per 8202/9 : 83.01 N
- Tearing resistance as per 8202/9 : 73.74 N
- Adhesion to primed concrete as per ASTM D 1000 : 4.9N/mm
- Adhesion to steel as per ASTM D 1000 : 5.8N/mm
- Puncture resistance as per ASTM E 154 : 246N/65mm
- Vapour transmission rate as per ASTM E 96 : 0.3g/ m^2/24 Hrs
- Cold flexibility as per ASTM D 146 : -30^{0}C
- Environment resistance as per ASTM D 543 : Conforms

SU 10: Polyurethane based highly flexible. The properties of cured sealant are as follows:-

- Hardness Shore A-DIN 53 505 : 20 - 25
- Modulus at 100% ISO 8339 : 0.20 - 0.25 Mpa
- Elongation at Break ISO 8339 : 250%

- Elastic recovery ISO 7389 : > 70%
- Water vapour Diffusion NFT 30018 : 32g/ m^2/24 hrs
- Movement Capability : 25%

Treatment Methodology:

Scope ..... Podium Slab

Substrate ..... RCC

Surface Preparation ..... All floor area including 300mm high on the wall shall be made free from all debris, dust, dirt and other. All sharp protrusions shall be grinded and made level with the surface.

Waterproofing Detail ..... All waterproof membrane detailing shall be carried out strictly in accordance with professional working practices for the installation of sheet/liquid membranes and in accordance with ARDEX ENDURA recommendations.

Potholes Filling ..... All potholes shall be filled as follows:-

- Mix the 3 part of powder of A 46 to 1 part of clean water in mixing vessel and mix thoroughly to obtain lump free and slump resistant mortar using slow speed heavy duty drilling machine fixed with mixing paddle. The mix will have a working time of 15 min.
- Apply the mortar using trowel to the all potholes ensuring that the mortar "wets" the surface by trowelling in firmly, leaving the surface proud.
- After 15 minutes, finish off with wet sponge or sponge float.

Construction joints

Treatment ..... All construction joints shall be treated using epoxy modified mortar as follows:-

- Cut open the construction joints by making groove in the form of "V" shape at required size.
- Clean the grooves and 75mm wide at both side of the joint to make it free from all dirt, dust and other contaminants.
- Apply neat coat of WPM 256 in and around the groove.

- Apply epoxy modified mortar of CM 1:3 admixed with WPM 256 at dosage of 1 Ltr per bag of 50Kg cement over the wet neat coat of WPM 256.
- Finish the surface with neat steel trowel flush with the surface.
- Allow the applied mortar to cure and dry completely.

Surface Consolidation ..... All corners and adjacent wall up to 300mm or up to skirting level shall be consolidated using polymer modified mortar as follows:-

- Mix WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin binder coat and spread the mix over the surface with brush (thickness not more than 2mm).
- Over wet binder coat, consolidate the vertical wall surfaces using polymer modified mortar at 8-10mm thick in CM 1:4 admixed with WPM 405 at a dosage of 1 Ltr per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate.
- All corners shall be finished with half round or fillet in shape.
- The applied plastered surface shall be allowed to cure and dry completely for 7 days.

Priming..... All surfaces shall be primed using WPM 240, single component; solvent based bitumen primer using good quality of roller and allowed to dry completely. Coverage shall be at 5-6 Sqm per Ltr. Actual coverage depends on the substrate porosity.

Waterproofing Membrane..... Install one layers of WPM 3000 X, SBS bitumen membrane by "peel and stick" over the podium slab including 300 mm high on the adjacent wall. WPM 3000 X shall be applied from the lowest point to enable laps to shed water. All edge and end laps must be overlapped minimum of 60 mm and 100mm respectively. Internal and external corners shall be reinforced with an extra layer of membrane at 300 mm wide. All end laps and exposed edges shall be sealed. Membrane shall be installed to all floor area including 300mm high on the wall.

All rolls of WPM 3000 X are marked with a 60mm line. There will be significant additional stresses at this corner and these must be accommodated.

Note ..... Under any circumstances, the membrane shall not be left exposed to UV light for long time.

Membrane Protection..... The applied 3000 X shall be protected by installing 4mm thick PVC boards. PVC boards shall be placed in position using Duct Tape / PVC Tape or similar.

Membrane Termination..... Terminate the edge of the membranes on to the adjacent wall by fixing aluminium pressure bars using anchor nails and SU 10.

Area 10.....Wet areas with dry wall

The main features /benefits of this system are:

- Water based acrylic primer for plaster board walls which creates positive bond between the waterproofing membranes.
- Water based epoxy polyamide membrane as a barrier coat for floor areas will enhance the performance.
- Excellent elongation and tensile strength (Elongation 333% as per AS 1145, tensile strength 2.9 MPa as per AS1145)
- Liquid reinforced: Excellent strength

Specification details

System proposed: Two components advanced acrylic modified, synthetic micro fibre reinforced membrane formulated to provide a tough, long lasting waterproofing system over water based epoxy polyamide moisture barrier coat at RCC floor area and plastered surfaces and over two components water based acrylic primer over dry walls

Product description:

B 30 : A non-shrink, chloride free, non-staining, general purpose, cementitious structural grout. The properties are as follows:-

- Initial Flow : 190-220 mm
- Time for expansion : Start 15 min & Finish 2 Hrs
- Fresh wet density : Approximately 2350 Kg/ m^3 depending on actual consistency used
- Compressive strength : 66 N/ m^2 @ 28 days
- Flexural strength : 10 N/ m^2 @ 28 days
- Tensile strength : 3.7 N/ m^2 @ 28 days
- Pullout bond strength : 5 N/ Sqmm @ 28 days
- Modulus of Elasticity : 30 N/ Sqmm
- Expansion characteristics : An expansion of 2 - 4% overcomes plastic settlement in the unset material

WPM 256: Two components water based epoxy polyamide act as high strength bonding bridge solution and admixture.

SU 10: Polyurethane based highly flexible sealants. The properties of cured sealant are as follows:-

- Hardness Shore A-DIN 53 505 : 20 - 25
- Modulus at 100% ISO 8339 : 0.20 - 0.25 Mpa

- Elongation at Break ISO 8339 : 250%
- Elastic recovery ISO 7389 : > 70%
- Water vapour Diffusion
  NFT 30018 : 32g/ m^2/24 hrs
- Movement Capability : 25%

WPM 300: Two components, water based epoxy polyamide barrier coating, which prevents rising dampness and the formation of efflorescence when used as single coat barrier coat.

WPM 265: Single component, water based acrylic primer for dry walls which creates positive bond between the waterproofing membrane and the substrate.

WPM 002: Is two components advanced acrylic cementitious modified, synthetic micro fibre reinforced membrane formulated to provide a tough, long lasting waterproofing system specially designed for in use with sandwiched situations. The product has been uniquely formulated with synthetic micro fibers to increase its strength. The properties are as follows:-

- Elongation at Break @ 7 days dry AS1145 : 332%
- Tensile Strength @ 7 days dry AS1145 : 1.7 MPa
  @Full Cure 28 days : 2.9 MPa
- Water Absorption AS A121 App K : 4.3%
- Shore A hardness - ASTM D2240 : Dry film 85 – 90
  : Wet film 75 - 80

Sealing tape 27010: Coated with thermoplastic elastomer, resistant to ageing, non-woven, elastic in cross direction and rigid in lengthwise, extremely thin, high tenacity, specially designed for floor & wall junctions. The properties are as follows:-

- Width Total : 120 mm
- Width of the coating : 70 mm
- Total Thickness : approx. 0.5 mm
- Material weight : approx. 24 g/m
- Coating : Thermoplastic elastomer, resistant to ageing
- Coating Colour : Grey
- Surface : Structure embossing
- Adhesive Agent : Applied on top of the whole surface
- Non-woven : No wicking/ Capillarity effect
- Chemical Resistance : Certificates upon request

- Product in water impermeable : tested and approved by competent agency
- Length Per Roll : 50 m
- Burst Pressure : 2.00 bar
- Elasticity lateral by 25% : 0.40 N/mm
- Elasticity lateral by 50% : 0.80 N/mm
- Elasticity lateral until break : 144,00 %
- Peeling Resistance : 10 N/10 mm
- Ozone Resistance : Resistant (DIN 53509 Part 1=ISO 1431-1) (evaluation level 0) Ozone quantity (200± 20) pphm
- Resistant to water pressure : Resistant (1.5 bar)
- UV- Resistance : Resistant (200 h, 254-360 nm) (Evaluation level 3-4)
- Resistance to Temperature : (-30°C to + 90°C)

WPM Deck Web: Non-Woven polyester glass filament reinforced reinforcing cloth of 50 Gsm. The properties are as follows:-

• Tensile strength at break	:	MD	160 daN/5cm(Avg)	120 daN/5cm(Min)
		CD	35 daN/5cm(Avg)	20 daN/5cm (Min)
• Elongation at break	:	MD	16% (Avg)	11%(Min)
		CD	40%(Avg)	28%(Min)

<u>Treatment Methodology:</u>

Scope ..... Internal floor and dry walls

Substrate ..... RCC floor and plastered and dry walls

Surface Preparation ..... All floor, wall and corners including butt joints of dry walls (full height for shower walls) shall be made free from dirt, dust, debris, laitance and other contaminants by mechanical means and wire brushing. All sharp edges, anchor fittings and protrusions shall be made flush with the surface. Dry walls shall be strong and rigid in position. All new surfaces shall be allowed to cure and dry completely according to standard practice. Imperfections, undulations and anchor fitting gaps on wall and

floor surfaces shall be made flush with the surface using Feather Finish, rapid drying, patching and smoothing compound mixed with water at rate of 2 parts of powder to 1 part of water (in case of thickness up to 3 mm only), and using A 45, rapid setting and rapid hardening internal repair mortar, by mixing it with water at rate of 3 part of powder to 1 part of water (in case of thickness more than 3 mm)

Waterproofing Detail ..... All waterproof membrane detailing shall be carried out strictly in accordance with professional working practices for the installation of Liquid membranes and in accordance with ARDEX ENDURA recommendations.

Bore Packing..... Bore packing shall be carried out as follows:-

Vertical Bore packing

- Fill all the gaps around the pipes using B 30 by mixing it with water of 0.19% of kilograms of powder used.
- All applied grouts shall be cured completely for 7 days by ponding method.

Horizontal Bore packing

- Apply a neat coat of WPM 256 to all wall internal surfaces and to pipe area.
- Fill all the gaps around the pipes over the wet WPM 256 coat using CM of 1:4 admixed with WPM 256 at dosage of 1 Ltr per bag of 50Kg cement and allowed to cure for 7 days.

Sealant

Application ..... A bead of SU 10 shall be applied at all vertical and horizontal corners, pipe penetrations including butt joints of dry walls and allowed to dry completely.

Primer For RCC Floor

And Plastered Walls ..... The application of WPM 300 as moisture barrier coat is as follows:-

- WPM 300 is a 2 components product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using heavy duty slow speed drilling machine fixed with mixing paddle to obtain a uniform mix.

- All floor areas and plastered walls shall be primed using WPM 300 in one coat at coverage of 3 Sqm per Ltr and allow it to dry completely.

Primer For Dry walls..... All wall surfaces shall be primed using WPM 265 to dry walls is as follows:-

- Stir the single component WPM 265 prior to application.
- All dry wall surfaces shall be primed using WPM 265 in one coat at coverage of 6-7 Sqm per Ltr using brush or long nap roller.
- Allow the surface to dry completely.

Waterproofing Membrane..... The application of WPM 002 as waterproofing membrane as follows:-

- WPM 002 is a two components product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using heavy duty slow speed drilling machine fixed with mixing paddle to obtain a uniform mix.
- Two coats of WPM 002 are required to achieve the correct dry film thickness of 1.00mm.
- Apply the first coat over the primed surface on all wall and floor surfaces. The waterproofing membrane shall be applied on the full height of the shower wall
- Install the WPM Deck web at all pipe penetrations and corners between the masonry walls (both vertical and horizontal) over the wet coat of WPM 002.
- Install the Sealing tape 27010 at corners between dry walls and masonry walls (both vertical and horizontal corners) over the wet surface of WPM 002
- Ensure the WPM Deck web and sealing tape 27010 is completely embedded in the coat of WPM 002 and allowed to dry (4 hours at 23°C, 50% RH).
- Apply the second coat of WPM 002 in opposite direction to the first coat and allow it to dry completely.

- Application Brush / Roller recommended: (A medium nap (8-12 mm pile) paint roller is recommended.) New rollers should be dampened with water before being used for the first time. For best results with a paint brush use a good quality, 50mm long bristle variety.

Installation Quality ..... It is critical that the application of 2nd coat over the 1st coat should be in right angle to that of 1st coat and the time gap of minimum 4 hours between the 1st and 2nd coat should be maintained strictly. Subsequent applications shall be carried out after 24 hrs followed by the application of 2nd coat of WPM 002.

Tiling and Grouting ..... All tiles as per client or architects requirement shall be installed using recommended ARDEX ENDURA adhesive by maintain joint gap of minimum 3mm and shall be allowed to dry completely. Grouting of the tile joints shall be carried out using recommended ARDEX ENDURA Grouts and shall be allowed to dry completely.

Area 11.....Small Planter Box

The main features and benefits are:

- Bitumen latex modified and highly flexible
- Contains a effective root inhibitor that repels most of the root growth that may damage the membrane and the structure as well, without killing the plant
- Tough, durable and provides long term protection.

- Excellent adhesion and can be applied to damp and dry surfaces.

Specification details

System proposed: Single component, liquid applied, latex modified, bituminous elastomeric, permanent flexible, tough waterproofing lining and specially formulated and incorporated with root inhibitor over the water based epoxy polyamide primer.

Products Specified And Descriptions:

A 46: Rapid setting and rapid hardening external repair mortar. The properties as are follows:-

• Bulk density of powder	:	Approx 1.3 Kg / Ltr	
• Weight of fresh mortar	:	Approx 1.8 Kg / Ltr	
• Working time	:	15 min	
• Walkable	:	2-3 hrs	
• Application thickness	:	2-30mm	
• Compressive Strength	:	After 28 days	20.0 N/mm²
• Tensile Bending Strength	:	After 28 days	6.0 N/mm²
• Freeze thaw and salt resistant	:	yes	
• Suitable for underfloor heating	:	yes	

WPM 256: Two components water based epoxy polyamide act as high strength bonding bridge solution and admixture.

WPM 405: SBR based, multipurpose, concentrated, liquid polymer additive, which when used with sand/cement, greatly improves the bond strength and flexibility. The properties are as follows:-

• pH	:	9 – 10
• Tensile adhesion over concrete(7 days)	:	1.5 Mpa
• Hydrostatic pressure resistance	:	50 psi(0.34 Mpa)
• As additive to screed Flexural strength	:	3.3 Mpa

SU 10: Polyurethane based highly flexible sealant. The properties of cured sealant are as follows:-

• Hardness Shore A-DIN 53 505	:	20 - 25
• Modulus at 100% ISO 8339	:	0.20 - 0.25 Mpa
• Elongation at Break ISO 8339	:	250%
• Elastic recovery ISO 7389	:	> 70%
• Water vapour Diffusion		

- NFT 30018 : 32g/ m^2/24 hrs
- Movement Capability : 25%

WPM 300: Is two parts water based epoxy polyamide primer which acts as moisture barrier coat.

WPM 320: Single part liquid applied, latex modified, bituminous elastomeric flexible water proofing membrane which is specially formulated incorporating root inhibitor. The properties of the membrane are:-

- Appearance & Odour : Thick black fluid, slight odour
- Recoat : 2-4 hours
- Hard Dry : 24 - 48 hours
- Tensile Strength : 1.8MPa
  6 days @ 23°C/50% RH plus 24 hrs at 70°C
- Elongation of break : 220%
  6 days @ 23°C/50% RH plus 24 hrs at 70°C

WPM Deck Web: Non Woven polyester glass filament reinforced reinforcing cloth. The properties are as follows:-

- Tensile strength at break : MD 160 daN/5cm(Avg) 120daN/5cm(Min)
  CD 35daN/5cm(Avg) 20daN/5cm (Min)
- Elongation at break : MD 16% (Avg) 11%(Min)
  CD 40%(Avg) 28%(Min)

<u>Treatment methodology:</u>

Scope ..... Planter Box

Substrate ..... Cement concrete / cement sand plaster surface

Surface Preparation ..... All dirt, dust and other contaminants shall be removed completely using wire brush over the entire floor area including wall up to required height. All new surfaces shall be allowed to cure and dry completely. Sharp edges and protractions shall be grinded to make them flush with the surface.

Sealant Application ..... All pipe penetrations and cracks (if any) shall be treated as follows:-

- All pipe penetrations and cracks (if any) shall be cut opened in the form of groove in "V" shape of required shape. The grooves shall be cleaned to make it free from all dirt dust and other contaminants.
- Apply a bead of SU 10 and allow it to dry completely.
- All pipe penetrations shall be applied with SU 10 and allowed to dry completely.

Construction joints

Treatment ..... All construction joints shall be treated using epoxy modified mortar as follows:-

- Cut open the construction joints by making groove in the form of "V" shape at required size.
- Clean the grooves and 75mm wide at both side of the joint to make it free from all dirt, dust and other contaminants.
- Apply neat coat of WPM 256 in and around the groove.
- Apply epoxy modified mortar of CM 1:3 admixed with WPM 256 at dosage of 1 Ltr per bag of 50Kg cement over the wet neat coat of WPM 256.
- Finish the surface with neat steel trowel flush with the surface.
- Allow the applied mortar to cure and dry completely.

Coving Installation ..... Coving shall be installed at all corners using polymer modified mortar as follows:-

- Apply binder coat of WPM 405 with water and cement (1 part of WPM 405 with 2 parts of water and 3 parts of cement) to a thin slurry and spread the mix over the surface with brush (thickness not more than 2mm).
- Install the polymer modified mortar over wet binder coat, at all corners in required size in half round or fillet in shape using CM 1:4 admixed with WPM 405 at a dosage of 1 Ltr per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate.
- The installed coving shall be allowed to cure and dry completely for 7 days.

Surface Consolidation ..... All surface shall consolidated using A 46 as follows:-

- Mix the 3 part of powder of A 46 to 1 part of clean water in mixing vessel and mix thoroughly to obtain lump free and slump resistant mortar using slow speed heavy duty drilling machine fixed with mixing paddle. The mix will have a working time of 15 min.
- Apply the mortar using trowel to the all surface to consolidate the minor undulations and potholes ensuring that the mortar "wets" the surface by trowelling in firmly, leaving the surface proud.
- After 15 minutes, finish off with wet sponge or sponge float.

Moisture barrier coat..... WPM 300 shall be applied to all surfaces as barrier coat as follows:-

- WPM 300 is a 2 components product consisting of Part A and Part B which needs to be mixed using heavy duty electric slow speed drill with necessary mixing paddle, to achieve a uniform mix before applying.
- All floor area including wall up to required height shall be primed using WPM 300 in one coat at coverage of 3 Sqm per Ltr. Allow the applied coat to dry completely.

Waterproofing Membrane..... The root inhabiting waterproofing membrane, WPM 320 shall be applied as follows:-

- WPM 320 is single component, shall be applied in two coats to achieve correct dry film thickness of 1.00mm. Apply the first coat over the primed surface and allow it to dry.
- All corners and pipe penetrations shall be incorporated with WPM Deck Web over the first wet surface of WPM 320. Apply the second coat of WPM 320 in opposite direction and allow it to dry completely.
- Application Brush / Roller recommended: (A medium nap (8-12 mm pile) paint roller is recommended.) New rollers should be dampened with water before being used for the first time.

For best results with a paint brush use a good quality, 50mm long bristle variety.

Installation Quality ..... It is critical that the application of 2nd coat over the 1st coat should be in right angle to that of 1st coat and the time gap of minimum 4 hours between the 1st and 2nd coat should be maintained strictly.

Drying..... The membrane will cure completely in 7 days. However, 48 hours is sufficient to proceed for pressure testing and further protection.

It is strongly recommended to protect the waterproofing membrane by providing protection plaster of bituminous modified mortar in order to avoid the damaging of the membrane by subsequent civil construction activities.

Protection Plaster ..... **Binder coat**Mix WPM 320 with water and cement (1 part of WPM 320 with 2 parts of water and 3 parts of cement) to form a thin slurry and spread the mix over the surface with brush (thickness not more than 2 mm).

Plastering Over wet binder coat consolidate all floor and wall surfaces using bituminous modified mortar at 12-15 mm thick in CM 1:4 admixed with WPM 320 at a dosage of 1 liter per bag of cement to achieve a uniform surface with a wooden float to work the mortar to achieve a good contact with the substrate.

Earth filling ..... Earth filling shall be carried out carefully with a proper supervision, not to damage the system. (As per landscape architect).

Area 12.....Facade Treatment

The normal paints that available are more decorative and can be weather proof to some extent. Usually most of the paints will not have any waterproofing, crack bridging and breathing properties. Effective external wall paint shall have all the following features to be an effective external facade membrane along with wide range of decorative colours.

The main features /benefits of this system are:

- Water based epoxy polyamide moisture barrier coat.

- Water based acrylic waterproofing membrane, to prevent moistures, salt, fungi and algae growth on external surface.
- Highly flexible, durable UV resistant, and waterproof.
- Self cleaning and low dirt retention.
- Decorative and available in large range of durable colors.
- Vapor permeable (allow substrate to breath).
- Highly crack bridging.

Specification details

System proposed: Extremely weather and UV resistant water based acrylic waterproofing membrane over water based epoxy polyamide moisture barrier coating.

Products Specified And Descriptions:

WPM 300: Two components, water based epoxy polyamide barrier coat.

WPM 310: Single component, extremely weather and UV resistant water based acrylic waterproofing membrane, to prevent moistures salt fungi and algae growth on external surface. The technical properties are as follows:-

- Water Vapor Transmission (ASTM E96)at 1.0 mm : 21.9 g/m^2/24hrs
- Tensile strength AS 1145
  - after 28 days dry : 2.1 MPa
  - after 14 days UV exposure : 3.0 MPa
  - after 2,500 Hrs QUV : 5.9 MPa
- Elongation at break AS 1145
  - after 28 days dry : 460%
  - after 14 days UV exposure : 315%
  - after 2,500 Hrs QUV : 180%

Treatment Methodology:

Scope ..... External faces of walls

Substrate ..... Plastered surfaces

Surface Preparation ..... All sharp edges shall be grind and made flush with the surface. The surfaces shall be made free from all dirt, dust, algae, fungi,

efflorescence and other contaminants. All sharp edges shall be grinded to make them flush with the surfaces.

Sealant Application..... All cracks (if any) and pipe penetrations shall be treated as follows:-

- All pipe penetrations and cracks (if any) shall be cut opened in the form of groove in "V" shape of required shape. The grooves shall be cleaned to make it free from all dirt dust and other contaminants.
- Apply a bead of SU 10 and allow it to dry completely.
- All pipe penetrations shall be applied with SU 10 and allowed to dry completely.

Moisture Barrier Coat ..... **Mixing:** WPM 300 is 2 components product consisting of part A and part B, which needs to be mixed in suitable size mixing vessel, using heavy duty slow speed drilling machine fixed with mixing paddle to obtain a uniform mix.

Application: All surfaces to which the waterproofing membrane is to be installed, including parapet wall surfaces and other protrusions shall be primed using WPM 300 in one coat at coverage of 3 Sqm per Ltr.

Facade Treatment..... WPM 310 is a single component. Apply with a nap/textured roller or paint brush. Ensure that the coating is applied evenly at the recommended coverage rates. Apply the first coat of WPM 310 and allow it to dry. Apply the second coat of WPM 310. Time gap of minimum 4 hours between the 1st and 2nd coat should be maintained strictly. The recommended coverage is 24 Sqm per 15 Ltr kit at DFT of 0.3mm.

Surfaces Finish..... The surface finish achieved can be varied by selection of the method of application. Suitable roller should be selected to achieve the desired texture finish.

Drying..... The membrane will cure completely in 7 days, but initial dry of 4 hours (after the 2nd coat) is sufficient and after that the membrane shall be left exposed even to heavy rain.