METHOD STATEMENT
MasterSeal 723ST - Below Grade Application

1 SCOPE

This document covers the installation of **MasterSeal 723ST**, SBS modified torch applied bituminous waterproofing membrane, for below grade application. All materials and method involved in the execution of the waterproofing work is described.

2 RESOURCES

2.1 Materials

Item	Description of Material
MasterSeal 723ST	SBS modified torch applied bituminous membrane
MasterSeal P 700	Solvent based bitumen primer
MasterSeal 720PB	Asphaltic protection board
MasterSeal 914	High strength impermeable flowable epoxy mortar
MasterFlow 980	High strength shrinkage compensated cementitious micro concrete

2.2 Tools and Equipment

Item	Equipment Description
1	Slow speed drill machine with less than 500 rpm and a suitable spiral mixer
2	Flame torch and propane gas cylinder
3	Wooden press and lap rollers
4	Brush / roller
5	Steel scraper
6	Measuring tape
7	Cutting knife and scissors
8	Cotton rugs

3 PROJECT EXECUTION / SEQUENCE OF WORKS

3.1 Substrate Preparation

- All surface to be treated shall be sound, should have clean surface free from laitance, oil, grease, mould release agent, residual curing compound, dust or other contaminants that could impair adhesion.
- Substrates must be regular and smooth, free of loose aggregate and sharp protrusions.
- All sharp edges to be chamfered (min 30mm) and internal corners to be filled with sand cement fillet, 50mm by 50mm.

3.2 Primer Application – MasterSeal P 700

- All concrete surfaces shall be primed by solvent based bitumen primer, **MasterSeal P 700**.
- Mix the contents of the pail/drum prior to the application to remove any sediment.
- Apply the primer @ 1 to 3 m²/liters depending on the porosity of the concrete by a brush, roller or an airless spray.
- Allow the primer to dry prior to the application of the waterproof membrane.
- If membrane application gets delayed for more than 24 hours after the primer has been applied on the concrete surface, then apply a fresh coat of the primer again.

3.3 Membrane Application – MasterSeal 723ST

3.3.1 Horizontal Membrane Application

- Unroll the roll of **MasterSeal 723ST** membrane and align the side laps.
- Re-roll the roll halfway and stand on the unrolled portion to prevent shifting. Side overlaps should be a minimum of 100 mm and the end overlaps 150mm.
- **MasterSeal 723ST** membranes are installed by using a cylinder fed propane gas torch. Use of hand-held roofing torches is also recommended as it gives a control on torching. If multiple burner torching machines are utilized, care must be taken to ensure the application of uniform heat and avoid overheating of the membrane.
- Begin torching the embossed printed polyethylene side of the rolled portion of the membrane. Proper torching procedure involves passing the torch flame in an ”L” pattern applying about 75 percent of the heat across the coiled portion of the roll and 25 percent across the substrate, including the lap area of the previously installed membrane.
- As the membrane is heated the embossing starts to melt away exposing a shiny bitumen surface. Roll forward the membrane and press firmly with the boot or roller against the substrate to bond well. The propane flame should be moved from side to side and up the lap edge while the membrane is slowly unrolled and adhered to the underlying surface.
- Subsequent shift of the roll shall be avoided after heating has begun. When complete, the remaining un-torched membrane shall be re-rolled and installed in the same manner. When one end is complete, re-roll the opposite end not yet torched, and install in the same manner.

- As subsequent rolls are installed, heat is applied to both the roll and the exposed laps of the membrane being overlapped onto. Be sure to heat the entire roll evenly, not just the lap areas, with extra concentration at the laps. Care shall be taken not to over torch the membrane as this will expose and damage the reinforcement.

3.3.2 Vertical Membrane Application

- Provide a 200-mm wide reinforcing strip of **MasterSeal 723ST** over the cement sand angle fillet.
- Install the membrane in vertical direction preferably till the top of the ground level, so that unnecessary joints are avoided which tend to be the weak spots for water leakage.
- The membrane will be finished on the top by tucking into a groove cut in the concrete and sealed with a suitable mastic sealant.
- All completed areas of **MasterSeal 723ST** shall be protected by a bitumen hard protection board, **MasterSeal 720PB**, from any damage or puncture due to ongoing site activities or during backfilling.

3.3.3 Second Layer Application for Double Layer System

- Install the membrane similarly with the first layer. Reinforcing strips on corners are not required.
- Lay the second layer over the overlaps of the first layer, ideally at half-width, staggering them from each other to avoid multiple membrane layering on the same overlap.
- All completed areas of **MasterSeal 723ST** shall be protected by a bitumen hard protection board, **MasterSeal 720PB**, from any damage or puncture due to ongoing site activities or during backfilling.

3.3.4 Sealing the Overlap

- Heat both the overlaps and use a round-tipped trowel to seal the overlap.
- Adequate heat is confirmed when a uniform flow of melted bitumen compound flows evenly in a bead that oozes from the applied membrane's edges. Excess compound should be smoothed and pressed into the seam using a heated trowel.
- Any un-bonded areas must be lifted and re-torched. Do not attempt to reseal by torching the top surface of the membrane.

3.3.5 Membrane Application on Pipes

- A cement sand angle fillet shall be provided all around the pipe joint, primed with **MasterSeal P 700** up to 400mm of the pipe length.
- A 400mm wide sleeve of **MasterSeal 723ST**, with dovetail cut at the base, shall be wrapped and torched around the pipe.
- Melt the dovetail-cut base of the sleeve and level it off using a steel trowel.
- Place/insert a doughnut-shaped reinforcing piece of membrane, tightly around the pipe and extending 200mm from it.
- Torch the reinforcing piece and smoothen the edges by melting it and leveling it off using a steel trowel.
- The end of pipe dressing shall be clamped in place using jubilee clips.
- The pipe dressing shall be protected with a 350gsm geotextile.

3.4 Pile Head Termination

3.4.1 Pile Dressing

- Pile heads should be re-profiled with **MasterFlow 980** and its base corner filled with a 50mm by 50mm sand cement fillet.
- The pile head and its repairs shall be sufficiently dry prior to dressing.
- Primer is required prior to application of pile dressing, but only up to where the membrane is expected.
- The membrane shall be terminated at the edge of the pile and shall be continued with a membrane dressing extending 100mm from the base and 100mm on top or just before the steel reinforcement if less.
- Create dovetail cuts on the dressing to allow proper fit, then level it off with the aid of the torch and steel trowel.
- The protection board (if any) must be terminated around the base of the pile.

3.4.2 Pile Encapsulation

- Create a shutter around the pile for epoxy encapsulation to provide a minimum epoxy thickness of 25mm over and around the pile.
- The pile head must be sufficiently dry prior to encapsulation.
- Encapsulate the pile with **MasterSeal 914**.
- **MasterSeal 914** shall be mixed by adding the contents of the reactor container to the base component in a suitable mixing vessel, ensuring complete transfer of both resin components. Mix for one minute before slowly adding the aggregate and continue mixing until a pourable consistency is achieved. Do not overmix as this may entrain air.
- Pour the mixed epoxy over the pile and spread it with the use of steel trowel.
- Bubbles on the surface of epoxy can be leveled-off by striking the surface lightly using a steel trowel. Dipping the steel trowel on solvent prior to striking will prevent the epoxy from sticking to the trowel. This method should be done when the epoxy starts to set, ideally after half an hour of casting, to make sure no more bubbles will appear.

3.5 Protection Layer Application

3.5.1 Protection Screed for Horizontal Membrane

- A 50-mm cement sand protective screed with a 1000gsm, polyethylene sheet separation layer, shall be provided on top of the membrane applied on the horizontal surface to protect it from damage from reinforcements and sharp aggregates present in the concrete.
- Aggregate size of protection screed shall not exceed 10mm.

3.5.2 Protection Board, MasterSeal 720PB for Vertical Membrane

- The membranes applied on the vertical surface shall be protected immediately from the ongoing site activities or from sharp aggregates during backfilling with a tough, weather, warp and rot proof asphaltic protection board, **MasterSeal 720PB**, of suitable thickness.

- Torch the underside of the protection board until the asphalt starts melting softly. Press the board immediately onto the substrate. Provide supports/props to keep the boards in place till the adhesive is strong enough to hold the board.

3.6 Membrane Repair

- Due to high chances of damaging the membrane caused by site activities, damages can be patched repaired with a piece of the same membrane which extends at least 100mm from all the sides of the puncture. The area to be repaired shall be primed with the **MasterSeal P 700** and allowed to dry before carrying out the patching work.

4 STORING AND PROTECTION OF MATERIAL

- All materials whether loose or on pallets have to be stored vertically in a covered area and protected from UV and sunlight.
- Rolls shall never be stacked but rather kept in an upright position. Damage to the membrane may be caused due to improper storage and at high temperatures.
- Application of membranes should be avoided in case of extreme weather conditions like sand storm or rain. The ambient temperature during application should be between 5°C and 45°C.