Liquid Rubber

APPLICATION GUIDELINES

APPLICATOR GUIDELINES

Applicators must agree to:

Promote, market, distribute, sell, use and apply the Products so as to maximize the business potential of the Products and the System.

Apply, use and install the Products in accordance with the System in particular in compliance with the Liquid Rubber Industries Inc. Manuals and Liquid Rubber Industries Inc. recommendations regarding thickness of application and usage of Liquid Rubber ancillary product(s).

Meet with Distributor and Liquid Rubber Industries Inc. from time to time, at such times and locations as Liquid Rubber Industries Inc. may reasonably request, to review and discuss the Applicator's performance and compliance with its obligations.

Maintain the highest degree of professionalism with respect to;

1) The conduct and appearance of Applicator and Applicators employees while on application sites,
2) The condition and cleanliness of pumps, containers and other equipment required or used in connection with the System, both on Applicator's own premises and on application sights,
3) The marketing of the Products and the System, and Liquid Rubber Industries Inc.,
4) Prepare and submit bids to the standard specified,

- Maintain all such policies of insurance as are necessary and customary with respect to Applicator's business, including, but not limited to, public liability, fire, workers' compensation and theft insurance,

- Attend training sessions, as required by Liquid Rubber Industries Inc. from time to time, in respect to the Products or the System all at Applicator's cost and expense,

- Refrain from giving any promises representation, warranties or guarantees in relation to the Products or the System without first obtaining approval in writing,

- At all times provide prompt, courteous and efficient service to its customers, and in all business dealings with members of the public observe the highest standards of honesty, integrity, fair dealing and ethical conduct. Do not engage in any actions that would tend to discredit, dishonor, or in any manner injure the reputation Liquid Rubber Industries Inc., Distributor or Applicator of Liquid Rubber Industries Inc.,

- Comply in all respects with all applicable laws and regulations in the use and application of Liquid Rubber Industries Inc.

WORK SAFETY PROCEDURES

1. All site staff will follow site Safety procedures as set down by the Builder or owner.

2. All site staff will wear all Safety equipment as required i.e.: hard hats, eye protection, safety boots.

3. Licensed electricians will tag all electrical leads and tools.

4. Worksite will be checked for Safety Hazards i.e.: edge protection, slippery surfaces.

5. Disposable overalls are to be worn while spraying.

6. Disposable dust masks are to be worn while spraying, especially in confined areas.

7. Site to be left in clean order at all times.

TYPICAL: LIQUID RUBBER INDUSTRIES INC.
APPLICATION NOTES

APPLICATION TECHNIQUE

The Membrane shall be spray applied in liquid form and air cured to form a seamless film.

The application shall be via a plural component spray gun and delivery equipment as approved by Liquid Rubber Industries Inc.

The Liquid Rubber Membrane System shall be supplied and installed by an approved Applicator.

The spray gun and associated delivery equipment shall be set up such so that the separate emulsion and catalyst are combined in two even fan patterns with no precipitation of either component. It shall produce a non-liquid coating exhibiting a finely textured surface with the characteristic of uniformly releasing the water carrier contained within the emulsion. The Applicator shall avoid overbuilding the Membrane beyond 5 mm without interlaying a layer of reinforcement fabric.

CURING

The nominal standard curing time is 48 hours. at 20^{o}C.

PROTECTION OF WORKS

The works shall be barricaded to prevent pedestrian or vehicular traffic.

The membrane Applicators shall attend and control their works until wear protection overlays are installed and completed.

REINFORCEMENT / PROTECTION

Immediately upon completion of the membrane application, a covering layer of geo-textile reinforcement shall be laid level to promote adhesion to the membrane and be followed by such protective sheeting, overcladding, or coating as specified.

Insulation (if required): Cover all membrane surfaces both horizontally and vertically with high density polystyrene foam panels, 10 mm gap fitted to cover the entire roof membrane and aligned to facilitate roof drainage.

REPAIRS

If the membrane suffers damage it shall be repaired by repeating the application process and overlapping the damaged area that has been trimmed and cleaned.

GENERAL NOTES

The Works Contractor shall provide works access, and site safety practices to avoid endangering the waterproofing Applicator, the passing public, and the building tenants.

STANDARD SURFACE SPECIFICATION

1.0 PREPARATION

Membrane substrate surfaces must be clean and free of debris. The surface must be free of wax, oil, and contaminants, and offer an unpolished, non-slippery, fine textured uniform base to the proposed Membrane, **(*EQUAL TO BULL FLOAT FINISHED 90 SLUMP CONCRETE*).** Proper surface preparation may require de-oiling, de-waxing, laitance removal, etching, shot peening, blast cleaning, crack filling, remedial fill topping, or adhered grade topping, as necessary.

2.0 BLOCKWORK

All blockwork to be flush jointed with no holes left in mortar joints, no excess mortar or concrete on blockwall face.

3.0 CONCRETE

Free from voids, bony surfaces or metal protrusions. Surfaces are to be free from curing agents, form release agents or chemicals that would interfere with the bonding capacity of the curing membrane to the substrate.

4.0 INTERNAL CORNERS

20 mm x 20 mm coved corners formed by Applicator.

5.0 EXTERNAL CORNERS

Built up.

6.0 PENETRATION

- All penetrations to be a minimum of 40 mm from parallel surface.
- Dual penetrations to be a minimum of 40 mm apart.
- All pipe penetrations to be tightly secured prior to membrane application.
- All wastes and or overflows to be flushed finished to enable application of membrane.
- All penetrations are to be sleeved, directed and/or fixed (i.e.: incapable of independent movement).

7.0 NOTATION

A minimum of 600 mm working space is required behind all walls. All surfaces to be applied with Liquid Rubber Membrane must be clear and free from non-structural or architectural structures. Surfaces not prepared as specified above may void warranty and/or incur site approval visit charges from Liquid Rubber Industries Inc.

PREPARATION OF PVC AND METAL PENETRATIONS/FLASHINGS

Liquid Rubber Industries Inc. recommends the following steps be taken prior to the application of RMS to PVC and metal penetrations/flashings.

1.0 APPLICATION TO METAL

1.1 Apply a thin tack coat of Liquid Rubber Spray Grade (Part A) to metal surfaces, and let touch dry.

1.2 Spray apply Liquid Rubber to entire area at required thickness.

2.0 APPLICATION TO PVC

2.1 Clean PVC substrate with a PVC primer/acetone; leave to air dry.

2.2 Apply a thin tack coat of Liquid Rubber Membrane Spray Grade (Part A) to PVC surfaces, and Liquid Rubber Membrane let touch dry.

2.3 Spray apply Liquid Rubber Spray Grade to entire area at specified thickness.

TYPICAL PRELIMINARIES FOR LIQUID RUBBER ON FLAT ROOFS

1.0 ROOFDRAINAGE

1.1 FALL

Adequate drainage fall should be specified at no less than the industry minimum requirement or at least 1.5% without ponding. Internal box and valley gutters require (at least) the same fall as roofs.

1.2 GUTTERING

Box/Valley Gutters can be waterproofed or overflashed using a continuation of the roof membrane. However, because gutters are such a critical waterproofing area, an additional reinforced layer of membrane is recommended.

Full bonding of the membrane to the gutter is recommended, but slip jointing should be incorporated at movement joints and at substrate junctions. Optimum drainage falls to Code sized outlet pipes should be maintained, and consideration should be given to maintenance and filtration systems to safeguard against build blockages from hailstones, vegetation and other waste accumulation. Overflow drainage should be allowed, and drip lips installed at all potential back tracking locations.

The design of gutters should permit differential thermal movement separation from the deck. A drip edge flashing should be formed/installed to support the membrane turndown, and to permit maintenance of gutters without disturbing the deck membrane.

1.3 MEMBRANE ENCAPSULATED OUTLETS

Drain outlets must be special flanged outlets that are specifically designed for membrane systems, and incorporate mechanical sealing against back pressure. Ideally, the outlets should be located at no greater than 7.5 metre centers and be of size/capacity to adequately evacuate the maximum expected water drainage load and to meet Local Government and National Standards. The outlet design shall allow for evacuation of water entrapped by the membrane as well as any requirement to drain the overlaid surface cladding.

2.0 FLASHINGS AND CAPPINGS

Cover flashings, masonry cappings and dampcourses play an equally important role in keeping a building waterproof, ***and are de facto*** **PARTS OF THE APPLICATOR'S RESPONSIBILITY.** Consideration should be given to the selection of materials and their placement in the structure. Poor flashing detailing can permit moisture entrapment within the masonry or plaster adjoining the roof membrane. As a general rule, flashings and capping heights should continue at least 150 mm above the highest water table level. **All flashings and dampcourses** must extend to overlap the membrane.

Metal flashings should be fixed and lapped to allow for thermal expansion. Different types of metals may catholically react and corrode. Similarly, metal may be broken down by some chemicals present in common building materials such as chloride salts, sulphides and alkalis. Careful consideration should be give to the possibility of these reactions when specifying.

3.0 PENETRATIONS

With time and exposure, vents, skylights, and other roof fixture penetrations can become loose. This movement may be transmitted directly to the membrane.
Separate sleeves or plinths, fixed to the deck, but free of the penetrations are recommended for independence of the membrane. The associated membrane turn-ups should be collar-overflashed off the penetrating fixture. Commercial Silicone Rubber collars are an acceptable alternative. High point placements are advisable.

4.0 TURN-UPS

Turn-ups are some of the most vulnerable points on a roof. They are susceptible to degradation from ultra violet radiation and possible mechanical damage. An additional layer of high performance membrane at these points is a wise precaution. The Membrane should be solidly bonded to vertical surfaces and to the deck. Bridge the actual junction with an angled fillet. Cover flashings should extend to the deck or surface finish level to provide additional protection.

Where adjoining walls are independent of the roof, slip sheeted or formed separation is recommended to allow for movement (for example, movement could be caused by natural settlement or the weight of additional claddings).

5.0 ANGLE FILLETS (see “Detailing” diagram appendix)

Perimeter coved or angled fillets (minimum 20 mm face) shall be placed to walls and upstands that are integral with the roof deck (or other substrate). The fillets help to distribute the forces of any concentrated movement and permit a smooth transition of the membrane from deck to wall.

6.0 IRMA (Inverted Roofing Membrane Applications)

Insulation boards, if installed, should be of premium quality high density, closed cell foam, to avoid water saturation of the insulant material.

7.0 EXPANSION AND CONTROL JOINTS (see “Detailing” diagram appendix)

A design-graded roof should have movement joints planned and sited at the highest points throughout the deck area to be sprayed. Slip-sheets shall be placed both under and over the membrane bridging such joints. The bridging membrane shall be fabric reinforced with elastic material suited and sized to accommodate the distribution of stresses from the expected movement of the joint or moving plane junction, and shall generally extend a minimum of 100 mm either side of the joint or junction. Engineering confirmation should be sought as to the magnitude of expected movement.

It is essential that in-situ movement joints be of their **DESIGN INTENDED SEPARATION DISTANCE THROUGHOUT THEIR SEPARATION** to avoid stresses to the membrane and structure that can cause physical damage. Neglecting this design detail may result in magnified movement(s) being transferred to the next operable joint or change of structural plane. Such magnified and unplanned movement(s) can abrade a sandwiched membrane or place excessive compression and delamination stresses at related upstands. The inspection and acceptance of movement joints should be included as a hold point in the Applicator's Preliminary Inspection and Test Plan.

8.0 SLIP SHEETS (see “Detailing” diagram appendix)

Slip sheeting is a laminate of flexible material that should be used where dissimilar movement is anticipated between the substrate and the surface cladding over the membrane. Slip sheeting may be placed between the membrane and the substrate, or the membrane and the overlay (if any). Slip sheeting protects the membrane from frictional and tensile causes of delamination, and rending. Slip sheeting is also employed where the membrane is required to bridge movement joints (as above), thus elastically distributing the movement stresses that would otherwise be concentrated on a small section of the membrane.

9.0 EXPANSION JOINT CAPS (see “Detailing” diagram appendix)

Membranes should not be subject to movement from high magnitude repetitive thermal cycling or other significant substrate movement. Such joints should be formed with non-flexural, non-contacting, non-corrosive metal or stable plastic profiles to form a fixed two-part wall and cap over the joint. Design should include fixings, allowance for lineal movement, assembly, required sealant to substrate, and protective measures from overcladding movement damage.

10.0 MEMBRANE MAINTENANCE

All flat roofs and associated flashings and cappings should be inspected at least every two years. Any signs of possible defects (possibly caused by mechanical damage or structural movement) should be immediately repaired.

11.0 VENTED MEMBRANES

The use of vented membranes is only required where water vapour emitted from the substrate is likely to cause probable blistering and uplifting of the overlaid membrane. The specified use of a vented membrane will be determined by the intended use of the structure and the Water Vapour Transmission permeability of the substrate.

Vented membranes have the disadvantage of permitting water interface of the substrate and membrane, but offer the benefit membrane that permits the unrestricted escape of moisture and tracking at the of a breathing related vapours.

OVER METAL ROOFING

1.0 GENERAL

The following is a typical specification for the Liquid Rubber Membrane when applied as a coating or new membrane over metal roofing. Each project will have special conditions and these should be identified and addressed additional to this specification. If in doubt, seek the advice of Liquid Rubber Industries Inc. before proceeding.

2.0 QUALITY ASSURANCE

2.1 The Liquid Rubber Membrane may only be applied by a qualified licensed Liquid Rubber Industries Inc. Applicator.

2.2 A pre-installation conference, to include at least the contractor, Applicator and architect/engineer should be held prior to application to ensure proper substrate and conditions.

3.0 INSPECTION

Prior to commencement of work, a thorough inspection of the roof surface should be carried out to determine or confirm the following:

3.1 A satisfactory surface for application.

3.2 A positive slope to and functioning of the roof drainage system.

3.3 The soundness and proper detailing of roof mounted supports, penetrations, flashing, outlets, turn-ups, and all other items that are to be a part of the new, completed roofing system.

3.4 The presence of rust, scale, loose joints, or fasteners.

3.5 If there is an existing coating on the roof; what is the compatibility of the coating and the Liquid Rubber Membrane. Compatibility should be determined by spraying a small test area.

4.0 PREPARATION

The Liquid Rubber Membrane must be installed on a clean, dry and structurally sound surface, free of sharp edges, loose or foreign material, dirt, oil, grease or other materials or debris that may damage the Liquid Rubber Membrane.

4.1 Repair and/or replace any details, flashing, penetrations or panels found to be suspect. Overlap details onto the existing roofing system three (3) times the diameter of pipe penetrations or a minimum of 100 mm to all sides.

4.2 Tighten all loose fasteners, replacing as necessary.

4.3 Clean all newly installed metal surfaces, including details, flashings, penetrations and panels, with environmentally friendly cleaner, to remove

any residual factory oils, rust or scale. Clean all other bare metal surfaces to which will be applied and etch with environmentally friendly cleaner. Water wash to complete the cleaning process. Power wash in the case of heavy rust or scale. Heavy rust or scale may require more than one application. All metal surfaces treated with environmentally friendly cleaner solution should be coated with Liquid Rubber promptly to avoid flash rusting.

4.4 Power wash or otherwise clean all other areas of the roof, as necessary, to provide a dirt free surface for application. If the existing roof has been coated, remove all loose and flaking material. In some cases, coated surfaces should be etched with environmentally friendly cleaner or primed to ensure proper adhesion of Liquid Rubber Membrane. If in doubt, consult Liquid Rubber Industries Inc. prior to application.

4.5 Apply a fillet, as necessary, after allowing time for surfaces to dry. Install 20 mm x 20 mm fillets to all 90-degree turn-ups, including details and penetrations, using a 100 mm knife to provide slightly curved fillets, leaving a smooth surface and transition.

4.6 Allow 12 hours cure time prior to application of the Liquid Rubber Membrane over filleting material.

4.7 Mask all areas as needed for protection from over-spray. Mask terminations to a straight line.

5.0 APPLICATION

5.1 Determine whether the Liquid Rubber Membrane is required as a coating, or a membrane. The recommended minimum thickness for a coating is 1 mm. The minimum recommended application of a membrane is 2 mm. In either case the application procedures below are the same.

5.02 Begin spraying from the lowest point of the roof to the highest point. Spray a thickening of material (twice the system thickness) to all vertical to horizontal intersections, such as wall/roof turn-ups, and to all expansion and construction joints, fillets and details. This thickening should extend 100 mm up the vertical surface and 150 mm onto the horizontal and at corners.

5.3 Detail Liquid Rubber Membrane around all penetrations.

5.4 Check Liquid Rubber Membrane for correct thickness in a grid pattern that incorporates sections not greater than 50 m^2.

5.5 If desired, application of a coating may proceed following a minimum of five (5) days curing. In this case, the membrane must be washed down with water to remove residue.

OVER WOOD DECKING

1.0 GENERAL

The following is a typical specification for the Liquid Rubber Membrane when applied as a coating or new membrane directly over wooden roof decks. Each project will have special conditions and these should be identified and addressed additional to this specification. If in doubt, seek the advice of Liquid Rubber Industries Inc. before proceeding.

2.0 QUALITY ASSURANCE

2.1 The Liquid Rubber Membrane may only be applied by a qualified licensed Liquid Rubber Industries Inc. Applicator.

2.2 A pre-installation conference, to include at least the contractor, Applicator and architect/engineer should be held prior to application to ensure proper substrate and conditions.

3.0 INSPECTION

Prior to commencement of work, a thorough inspection of the deck surface should be carried out to determine or confirm the following:

3.1 A satisfactory surface for application.

3.2 Positive and functioning drainage to deck surfaces.

3.3 Soundness and correctness of detailing to pipe penetrations, flashing, outlets, turn-ups, etc.

3.4 The presence of dry rot or delaminations in the deck or supports as a result of existing leaks. Such areas should be clearly marked.

3.5 The presence of large irregularities (i.e.: knot holes etc.) or large gaps or open areas in the decking. Such areas should be clearly marked.

3.6 The soundness of the paint, if the existing decking has been painted, and the compatibility of the paint and the Liquid Rubber Membrane. If in doubt, compatibility should be determined by spraying a small test area.

4.0 PREPARATION

The Liquid Rubber Membrane must be installed on a clean, dry and structurally sound surface, free of sharp edges, loose or foreign material, dirt, oil, grease or other materials or debris that may damage the Liquid Rubber Membrane.

4.1 Repair and/or replace any details, flashing, penetrations or panels found to be suspect. Overlap details onto the existing roofing system three (3) times the diameter of pipe penetrations or a minimum of 100 mm to all sides.

4.2 Clean all newly installed metal surfaces, including details, flashings, penetrations and panels, with environmentally friendly cleaner, to remove any residual factory oils, rust or scale. Clean all other bare metal surfaces to which Liquid Rubber Membrane will be applied and etch with environmentally friendly cleaner. Water wash to complete the cleaning process. Power wash in the case of heavy rust or scale. Heavy rust or scale may require more than one application. All metal surfaces treated with environmentally friendly cleaner solution should be coated with Liquid Rubber Membrane promptly to avoid flash rusting.

4.3 Power wash or otherwise clean all other areas of the deck, as necessary, to provide a dirt free surface for application. If the existing deck has been coated, remove all loose and flaking material. In some cases, coated surfaces should be etched with environmentally friendly cleaner or primed to ensure proper adhesion of Liquid Rubber Membrane. If in doubt, consult Liquid Rubber Industries Inc. prior to application.

4.4 Apply a fillet, as necessary, after allowing time for surfaces to dry. Install 20 mm x 20 mm fillets to all 90-degree turn-ups, including details and penetrations, using a 100 mm knife to provide slightly curved fillets, leaving a smooth surface and transition. Fill all large irregularities or depressions with suitable filler. Fill all joints to prevent entry of water into the interior during the curing process.

4.5 Allow 12 hours cure time prior to application of the Liquid Rubber Membrane over filleting material.

4.6 Mask all areas as needed for protection from over-spray. Mask terminations to a straight line.

5.0 APPLICATION

5.1 Determine whether the Liquid Rubber Membrane is required as a coating, or a membrane. The minimum recommended thickness for a coating is 1 mm. The minimum recommended thickness for a membrane is 2 mm. In either case the application procedures below are the same.

5.2 Begin spraying from the lowest point of the deck to the highest point. Spray a thickening of material (twice the system thickness) to all vertical to horizontal intersections, such as wall/roof turn-ups, and to all expansion and construction joints, fillets and details. This thickening should extend 100 mm up vertical surface and 150 mm onto the horizontal and corners.

5.3 Detail Liquid Rubber Membrane around all penetrations.

5.4 Check Liquid Rubber Membrane for correct thickness in a grid pattern that incorporates section of not greater than 10 m^2.

5.5 Application of a coating, if desired, can proceed following a minimum of five (5) days curing. In this case wash Liquid Rubber Membrane with water to remove residue.

OVER MODIFIED BITUMEN ROOFING

1.0 GENERAL

The following is a typical specification for the Liquid Rubber Membrane when applied as a coating or new membrane over smooth hot pour or modified bitumen membrane systems. Each project will have special conditions and these should be identified and addressed additional to this specification. If in doubt, seek the advice of Liquid Rubber Industries Inc. before proceeding.

2.0 QUALITY ASSURANCE

2.1 The Liquid Rubber Membrane may only be applied by a qualified licensed Liquid Rubber Industries Inc. Applicator.

2.2 A pre-installation conference, to include at least the contractor, Applicator and architect/engineer should be held prior to application to ensure proper substrate and conditions.

3.0 INSPECTION

Prior to commencement of work, a thorough inspection of the roof surface should be carried out to determine or confirm the following.

3.1 A positive slope to, and functioning of, the roof drainage system.

3.2 The soundness of the existing roof membrane to the roof.

3.3 The presence of wet insulation or dry rot resulting from existing leaks, using a moisture meter and taking core samples, where indicated.

3.4 The soundness and proper detailing of roof mounted supports, penetrations, flashings, outlets, turn-ups, sumps and all other items which are to be part of the new, completed roofing system.

3.5 The presence of delaminated layers of existing roof felts or sheeting, such as sheet laps, or large blisters, fish mouths or cracked or brittle areas. All such areas should be clearly marked.

3.6 The soundness and correctness of the existing top coat, if the membrane has been coated, to the existing membrane, and the compatibility of the coating and the Liquid Rubber Membrane. If in doubt, compatibility should be determined by spraying a small test area.

4.0 PREPARATION

The Liquid Rubber Membrane must be installed on a clean, dry and structurally sound surface, free of sharp edges, loose or foreign material, dirt, oil, grease or other materials or debris that may damage the Liquid Rubber Membrane.

4.1 If existing roof is granulated modified, remove granules to fullest extent possible by using power broom or other suitable means.

4.2 Remove all grates, drain covers, and other fittings and loose items on the roof surface.

4.3 Repair dry rot and replace wet insulation, as needed. New insulation should be sufficient thickness so as to be level with existing roof.

4.4 Fill any significant cracks or voids in the immediate substrate with suitable filler, using a backer rod, where necessary, and trowel to form a smooth surface.

4.5 If the existing roof has been coated and the coating found compatible with the Liquid Rubber Membrane, remove all loose and flaking material.

4.6 Cut out all large blisters and delaminated areas and patch with suitable filler as follows:

1) Cut a "Y" through the blister or delaminated area and fold the segments back to a sound roof.
2) Thoroughly dry any moisture from the exposed area and remove any dirt or debris.
3) Apply suitable adhesive to the exposed area, fold the segments back over the adhesive and trowel smooth.
4) Top-dress the repair with suitable filler and trowel smooth over an area 200 mm outward from the outside edges of the repair.

4.7 Once the existing roof has been determined to be a sound substrate for application, repair and/or replace any details, flashings or penetrations found to be suspect. Overlap details onto existing membrane three (3) times the diameter of pipe penetrations or a minimum of 100 mm to all sides.

4.8 Clean all newly installed metal surfaces, including details, flashings, penetrations and panels, environmentally friendly cleaner, to remove any residual factory oils, rust or scale. Clean all other bare metal surfaces to which will be applied and etch with (No muratic acid) water wash to complete the cleaning process. Power wash in the case of heavy rust or scale. Heavy rust or scale may require more than one application. All metal surfaces treated with environmentally friendly cleaner solution should be coated with Liquid Rubber Membrane promptly to avoid flash rusting.

4.9 Power wash or otherwise clean all other areas of the roof, as necessary, to provide a dirt-free surface for application. If the existing roof has been coated, remove all loose and flaking material. In some cases, coated surfaces should be etched with environmentally friendly cleaner or primed to ensure proper adhesion of Liquid Rubber Membrane if in doubt, consult Liquid Rubber Industries Inc. prior to application of Liquid Rubber Membrane.

4.10 Apply a fillet, as necessary, after allowing time for surfaces to dry. Install 20 mm x 20 mm fillets to all 90-degree turn-ups, including details and penetrations, using a 100 mm knife to provide slightly curved fillets, leaving a smooth surface and transition. Fill all large irregularities or depressions with suitable filler. Fill all joints to prevent entry of water into the interior during the curing process.

4.11 Allow 12 hours cure time prior to application of the Liquid Rubber Membrane over filleting material.

4.12 Mask all areas as needed for protection from over-spray. Mask terminations to a straight line.

5.0 APPLICATION

5.1 Determine whether the Liquid Rubber Membrane is required as a coating, or a membrane. If a coating, the recommended minimum thickness is 1 mm. The minimum recommended thickness of a membrane is 2 mm. In either case the application procedures below are the same.

5.2 Begin spraying from the lowest point of the roof to the highest point. Spray a thickening of material (twice the system thickness) to all vertical to horizontal intersections, such as wall/roof turn-ups, and to all construction and expansion joints, fillets and details. This thickening should extend 100 mm up the vertical surface and 100 mm onto the horizontal and at the corners. In all cases, continue the Liquid Rubber Membrane beyond existing, underlying membrane and any underlying filling.

5.3 Detail Liquid Rubber Membrane into sumps and penetrations, whether or not the existing underlying membrane is detailed into these areas.

5.4 Check Liquid Rubber Membrane for correct m^2 thickness in a grid pattern that incorporates sections not greater than 50.

5.5 Application of a coating, if desired, can proceed following a minimum of five (5) days curing.

BELOW GRADE BLOCK-WORK

1.0 GENERAL

The following is a typical specification for Liquid Rubber Membrane when applied as a new membrane to concrete block work as the waterproofing medium in below grade applications. Each project will have special conditions and these should be identified and addressed additional to this specification. If in doubt, seek the advice of Liquid Rubber Industries Inc. before proceeding.

2.0 QUALITY ASSURANCE

2.1 The Liquid Rubber Membrane may only be applied by a qualified licensed Liquid Rubber Industries Inc. Applicator.

2.2 A pre-installation conference, to include at least the contractor, Applicator and architect/engineer should be held prior to application to ensure proper substrate and conditions.

3.0 INSPECTION

Prior to commencement of work, a thorough inspection of the block surface should be carried out to determine or confirm the following:

3.1 All mortar joints to be flush with block-work.

3.2 All voids to be filled with sand/cement mixture.

3.3 Complete exposure of all block-work surfaces to allow the application of the Liquid Rubber Membrane to the extent shown on the drawings.

3.4 Soundness and correctness of penetrations in the block-work. Dual penetrations are to be a minimum of 50 mm apart and a minimum of 50 mm from the base. Penetrations are to be grouted in flush to block-work and free of voids.

3.5 Sufficient working area to apply membrane (minimum 600 mm).

Note: Allow block-work to be waterproofed to cure for a minimum of 24 hours. If blockwork is filled with concrete, allow an additional (minimum) period of 24 hours prior to application of Liquid Rubber Membrane.

4.0 PREPARATION

The Liquid Rubber Membrane must be installed on a clean, noticeably dry and structurally sound surface, free of sharp edges, loose or foreign material, dirt, oil, grease or other materials or debris that may damage the Liquid Rubber Membrane.

4.1 Fully expose a minimum of 50 mm clear area of footing at the base of block-work. Sweep any sand, dirt or other debris from the block-work and base to allow installation of Liquid Rubber Membrane.

4.2 Fill all void spaces and remove excess mortar to provide an uninterrupted block-work finish.

4.3 Install 20 mm x 20 mm fillets to all 90-degree up-turns.

4.4 Mask all areas as needed for protection from over-spray. Mask terminations to a straight line.

5.0 APPLICATION

5.1 The Liquid Rubber Membrane for this application is to be applied to a minimum thickness of 2 mm.

5.2 Begin spraying from the lowest point of block work to the required height in slow even strokes. Spray a thickening of material (twice the system thickness) to all expansion and construction joints as well as 90-degree transitions in block work. This thickening should extend 150 mm on either side of corners.

5.3 Check Liquid Rubber Membrane for correct thickness in a grid pattern every 10 m^2.

5.4 Following completion of application and Inspection & Test Plan checks Liquid Rubber Industries Inc. recommends the minimum installation of a protective geo-fabric (A12) with selected back-fill.

5.5 Non selected back-fill requires an A34 geo-fabric or protection board at additional cost.

CONCRETE DECKING

1.0 GENERAL

The following is a typical specification for the Liquid Rubber Membrane when applied as a coating or new membrane to concrete decks. Each project will have special conditions and these should be identified and addressed additional to this specification. If in doubt, seek the advice of Liquid Rubber Industries Inc. before proceeding.

2.0 QUALITY ASSURANCE

2.1 The Liquid Rubber Membrane may only be applied by a qualified licensed Liquid Rubber Industries Inc. Applicator.

2.2 A pre-installation conference, to include at least the contractor, Applicator and architect/engineer should be held prior to application to ensure proper substrate and conditions.

3.0 INSPECTION

Prior to commencement of work, a thorough inspection of the substrate should be carried out to determine or confirm the following:

3.1 Particularly in the case of new construction, determine whether curing or parting compounds or hardeners were used and, if so, the specific compounds used. Non-oil based compounds are generally compatible with and are preferred. However, oil based compounds do not present a problem if the surface is properly prepared (see 4.1 below). Refer questions regarding compatibility to Liquid Rubber Industries Inc.

3.2 The presence of laitance on the deck surface.

3.3 The presence of moisture in the deck.

3.4 The presence of large irregularities, such as cracks, voids, bug holes, or large gaps.

3.5 Correct sloping, and effective integration of the deck drainage system.

3.6 Soundness and proper detailing of roof mounted supports, penetrations, flashing, outlets, turn-ups, sumps, and all other items that are to be part of the new, completed deck area.

3.7 The soundness of the existing top coat, if the deck has been coated, to the existing deck, and the compatibility of the coating and the Liquid Rubber Membrane should be determined by spraying a small test area.

4.0 PREPARATION

The Liquid Rubber Membrane must be installed on a clean, dry and structurally sound surface, free of sharp edges, loose or foreign material, dirt, oil, grease or other materials or debris that may damage the Liquid Rubber Membrane.

4.1 Power wash or otherwise clean the deck, as necessary, including high pressure water blast to remove residual curing or parting compounds, hardeners, laitance or loose and flaking paint. High-pressure water blast will generally eliminate any problems associated with such compounds.

4.2 Allow deck to dry until free of surface moisture and, if possible, free from retained moisture. Some blistering may occur if moisture is entrapped in the deck at the time of application or, particularly in the case of new construction due to off-gas of the concrete when sealed. These blisters will disappear within a few days, without detriment to the Liquid Rubber Membrane as the moisture or gas is absorbed into the substrate.

4.3 Remove all grates and other fittings to the deck surface.

4.4 Fill any significant irregularities in the immediate substrate, such as cracks, voids or bug holes, or large gaps in the case of precast construction, with suitable filler to form a smooth surface.

4.5 Once the existing deck has been determined to be a sound substrate for application, repair and/or replace any details, flashing, or penetrations found to be suspect. Overlap details onto the existing system three (3) times the diameter of pipe penetrations or a minimum of 100 mm to all sides.

4.6 Clean all newly installed metal surfaces, including details, flashings and penetrations, with environmentally friendly cleaner, to remove any residual factory oils, rust or scale. Clean all other bare metal surfaces to which will be applied and etch with environmentally friendly cleaner. Water wash to complete the cleaning process. Power-wash in the case of heavy rust or scale. Heavy rust or scale may require more than one application. All metal surfaces treated with environmentally friendly cleaner solution should be coated with Liquid Rubber Membrane promptly to avoid flash rusting.

4.7 Apply a fillet, as necessary, after allowing time for surfaces to dry. Install 20 mm x 20 mm fillets to all 90-degree turn-ups, including details and penetrations.

4.8 Allow 12 hours cure time prior to application of the Liquid Rubber Membrane over filleting material.

4.9 Mask all areas as needed for protection from over-spray. Mask terminations to a straight line.

4.10 Check wind conditions prior to application and compensate for over-spray.

5.0 APPLICATION

5.1 Determine whether the Liquid Rubber Membrane is required as a coating, or a membrane. The minimum recommended coating thickness is 1 mm. The minimum recommended membrane thickness is 2 mm. In either case, the application procedures are as follows.

5.2 Begin spraying from the lowest point of the deck to the highest point. Spray a thickening of material (twice the system thickness) to all vertical to horizontal intersections, such as wall/roof turn-ups, and to all expansion and construction joints, fillets and details. This thickening should extend 100 mm up the vertical surface and 150 mm onto the horizontal and at corners.

5.3 Detail Liquid Rubber Membrane into sumps and penetrations.

5.4 Check Liquid Rubber Membrane for correct thickness in a grid pattern every 50 m^2.

5.5 If desired, application of a coating may proceed following a minimum of five (5) days curing. In this case, the membrane must be washed down with water to remove residue.

PLANTER BOXES

1.0 GENERAL

The following is a typical specification for the Liquid Rubber Membrane when applied as a coating or new membrane as the waterproofing membrane for planter boxes/roof gardens etc. Each project will have special conditions and these should be identified and addressed additional to this specification. If in doubt, seek the advice of Liquid Rubber Industries Inc. before proceeding.

2.0 QUALITY ASSURANCE

2.1 The Liquid Rubber Membrane may only be applied by a qualified licensed Liquid Rubber Industries Inc. Applicator.

2.2 A pre-installation conference, to include at least the contractor, Applicator and architect/engineer should be held prior to application to ensure proper substrate and conditions.

3.0 INSPECTION

Prior to commencement of work, a thorough inspection of the planter box surface should be carried out to determine or confirm the following:

3.1 Area to be waterproofed should maintain positive falls to drainage outlets.

3.2 Soundness and correctness of pipe and other penetrations, dual penetrations are to be a minimum of 50 mm apart and 50 mm from base.

4.0 PREPARATION

The Liquid Rubber Membrane must be installed on a clean, dry and structurally sound surface, free of sharp edges, loose or foreign material, dirt, oil, grease or other materials or debris that may damage the Liquid Rubber Membrane.

4.1 Remove all concrete sharps, fins and other irregularities. Patch concrete surfaces using sand cement and bondcrete mixture to fill void spaces.

4.2 All expansion joints to be detailed as per end specification.

4.3 Install 20 mm x 20 mm fillets to all 90-degree up-turns.

4.4 Mask all areas as needed for protection from over-spray. Mask terminations to a straight line.

4.5 Prepare all steel/PVC penetrations as per Section: “Preparation of PVC/Metal”.

5.0 APPLICATION

5.1 Begin spraying the complete area of the base of the planter box, returning 150 mm up the walls, starting from the outlets to the highest point. Spray a thickening of material (twice the system thickness) to all construction and expansion joints, as well as all 90-degree transitions.

5.2 Immediately upon completion of the base, spray the wall areas returning down over previously sprayed area.

5.3 Check Liquid Rubber Membrane for correct thickness in a grid pattern every 10 m^2.

5.4 Overlay the completed, inspected, and water tested Liquid Rubber Membrane using a geo-fabric (A12) on walls and 200 UM plastic sheeting on floors with 100 mm turn-up.

Note: Protection board may be required (as specified by architect/engineer).

CONCRETE SLABS

1.0 GENERAL

1.1 The following is a typical specification for the Liquid Rubber Membrane when applied as a new membrane to a concrete slab as a waterproofing medium. Each project will have special conditions and these should be identified and addressed additional to this specification. If in doubt, seek the advice of Liquid Rubber Industries Inc. before proceeding.

2.0 QUALITY ASSURANCE

2.01 The Liquid Rubber Membrane may only be applied by a qualified licensed Liquid Rubber Industries Inc. Applicator.

2.2 A pre-installation conference, to include at least the contractor, Applicator and architect/engineer should be held prior to application to ensure proper substrate and conditions.

3.0 INSPECTION

Prior to commencement of work, a thorough inspection of the concrete surfaces should be carried out to determine or confirm the following:

3.1 Check concrete slab for voids and irregularities.

3.2 Check that there is sufficient and safe working area.

3.3 Soundness and correctness of pipe and other penetrations. This requires these penetrations be grouted in flush to the concrete and be free of voids and clear of concrete slab by a minimum of 50 mm.

4.0 PREPARATION

The Liquid Rubber Membrane must be installed on a clean, noticeably dry and structurally sound surface, free of sharp edges, loose or foreign material, dirt, oil, grease or other materials or debris that may damage the Liquid Rubber Membrane**.** Concrete slab to be of a light broom finish or smoother.

4.1 Remove all concrete sharps, fins and other irregularities. Patch concrete surfaces using sand cement and bondcrete mixture to fill void spaces.

4.2 All expansion joints to be detailed as per engineers' specification.

4.3 Install 20 mm x 20 mm fillets to all 90-degree up-turns.

4.4 Mask all areas as needed for protection from over-spray Mask terminations to a straight line.

4.5 Prepare all steel: PVC penetration as per Section: “Preparation of PVC/Metal”.

5.0 APPLICATION

5.1 Perimeter Terminations:
Cut out lengths of geo-fabric and spray apply Liquid Rubber Membrane to a nominal thickness of 2 mm minimum.

Ensure that the sprayed geo-fabric is tightly fitted into internal corners where form works meets the concrete slab.

This procedure should be done in sections (of a manageable size). Similarly, Liquid Rubber Membrane should be applied in corresponding sections.

5.2 Begin spraying the concrete slab from the lowest point to the highest point making sure a thickening of material is applied to the joint where the perimeter termination meets the concrete slab.

5.3 Check Liquid Rubber Membrane for correct thickness in a grid pattern that incorporates sections not greater than 10 m^2.

5.4 Complete a thorough inspection of the sprayed area prior to laying down a protection system.

5.5 Begin spraying from the footing to the highest point in slow even strokes. Spray a thickening of material (twice the system thickness) to all expansion and construction joints, as well as all 90-degree transitions. This thickening should also extend a 150 mm either side of the corners.

6.0 PROTECTION

6.1 Roll out black geo-tech fabric over the entire horizontal area, making sure that lapjoints are a minimum of 50 mm.

7.0 REINFORCING STEEL

7.1 All steel bar chair are to be supported on base plates. Precaution is to be taken not to damage the membrane during placement of concrete.

TANKING TO RETAINING WALLS, LIFT PITS AND OTHER SUBSTRUCTURE APPLICATIONS

1.0 GENERAL

The following is a typical specification for the Liquid Rubber Membrane when applied as a tanking to retaining walls, basement walls, lift pits and other substructures. Each project will have special conditions and these should be identified and addressed additional to this specification. If in doubt, seek the advice of Liquid Rubber Industries Inc. before proceeding.

2.0 QUALITY ASSURANCE

2.1 The Liquid Rubber Membrane may only be applied by a qualified licensed Liquid Rubber Industries Inc. Applicator.

2.2 A pre-installation conference, to include at least the contractor, Applicator and architect/engineer should be held prior to application to ensure proper substrate and conditions.

3.0 PREPARATION

3.1 The Liquid Rubber Membrane must be installed on clean, dry and structurally sound concrete or other sound base, or to geo-textiles as specified by Liquid Rubber Industries Inc.

3.2 Formed surfaces shall be finished in accordance with the requirements of the architect or engineer. Slab surfaces shall be given a float finish to a class B tolerance throughout.

3.3 Application to surfaces where curing compounds have been used should be referred to Liquid Rubber Industries Inc. before proceeding.

3.4 If the concrete surface has been soiled with oil, grease or an accumulation of mud or dirt, it must be washed with an industrial detergent or degreaser compound, followed by a thorough rinsing and drying.

3.5 All loose concrete, laitance, sharp edges, oil or unusual stains should be removed by sandblasting, water blasting or etching. All excess sand, laitance, dust and dirt shall be removed, leaving a clean, dry surface, at the junction where the wall meets the footing is to be cleared a minimum of 50 mm to continue membrane to footing.

3.6 To all penetrations, outlets, up-turns and other details provide a 20 mm fillet of suitable fillet material. Penetrations to be a minimum of 50 mm from slab level.

4.0 APPLICATION

4.1 Liquid Rubber Membrane shall be applied to the specific thickness (usually 2 mm) starting at low points or base of wall.

5.0 DETAILING

5.1 Refer to Section: “Typical Details”. If unusual details are present Liquid Rubber Industries Inc. will design details to the specific project.

6.0 PROTECTION OF MEMBRANE

6.1 Liquid Rubber Membrane must be protected from backfill material and physical abuse by the installation of suitable protection board.

EARTHEN PONDS, LAKES & RESERVOIRS

1.0 GENERAL

The following is a typical specification for the Liquid Rubber Membrane when applied as a liner membrane for earthen ponds, lakes and reservoirs. Each project will have special conditions and these should be identified and addressed additional to this specification. If in doubt, seek the advice of Liquid Rubber Industries Inc. before proceeding.

2.0 QUALITY ASSURANCE

2.1 The Liquid Rubber Membrane may only be applied by a qualified licensed Liquid Rubber Industries Inc. Applicator.

2.2 A pre-installation conference, to include at least the contractor, Applicator and architect/engineer should be held prior to application to ensure proper substrate and conditions.

3.0 INSPECTION

Prior to commencement of work, a thorough inspection of the substrate should be carried out to determine or confirm the following:

3.1 Earth works to be carried out as per engineers' specification.

4.0 PREPARATION

4.1 Liquid Rubber Membrane shall be installed on smooth sand, clay or concrete binding, free of sharps and undulations, as well as free of weeds and other vegetation.

4.2 Perimeter Termination Trench:
In most cases Liquid Rubber Membrane requires the perimeter to terminate into a trench for marginal support of the sides of the liner. It serves as secondary and final fixing points of the perimeter of the membrane, and its use is recommended even when the trench has no anchoring requirements specified.

4.3 Provide a continuous trench at least 200 mm wide by 200 mm deep at perimeter.

4.4 Soil sterilant must be sprayed onto dirt sub-base for all ponds, lakes and reservoirs before geo-textile is rolled out. Spray apply the soil sterilant according to its manufacturer's recommendations.

4.4 Roll out geo-textile on sub-grade overlapping seams a minimum of 100 mm. Lay out geo-textile tight at all inside corners. Using galvanized pins secure geo-textile on at 2 mm grid pattern. Spray Liquid Rubber Membrane within the seam overlaps to a thickness of 1 mm minimum.

4.6 Terminate perimeter ends by making at least 2 complete turns around a one-inch PVC pipe. Place pipe in bottom of trench and back fill.

5.0 APPLICATION

5.1 Liquid Rubber Membrane for this application is to be applied at a thickness of between 2 mm to 3 mm.

5.2 Carry out pre-detailing to penetrations applying a thickening of 2 mm.

5.3 Begin spraying from the lowest to the highest point in slow even strokes.

5.4 Check membrane for correct thickness in a grid pattern incorporating sections not greater than 10 m^2.

MARINE COATING (RMC): VOID OR BALLAST TANKS

1.0 GENERAL

The following is a typical specification for the Liquid Rubber Membrane when applied to the interior of pre-load or ballast tanks. Each project will have special conditions and these should be identified and addressed additional to this specification. If in doubt, seek the advice of Liquid Rubber Industries Inc. before proceeding.

2.0 QUALITY ASSURANCE

2.1 The Liquid Rubber Membrane may only be applied by a qualified licensed Liquid Rubber Industries Inc. Applicator.

2.2 A pre-installation conference, to include at least the contractor, Applicator and architect/engineer should be held prior to application to ensure proper substrate and conditions.

3.0 INSPECTION

Prior to commencement of work, a thorough inspection of the substrate should be carried out to determine or confirm the following:

3.1 The availability of a satisfactory surface for application.

3.2 The presence of oil, grease, or similar substances on the application surface.

3.3 The presence of rust or scale, or loose joints or fasteners, cracked webbing, loose or flaking existing coatings.

4.0 PREPARATION

The Liquid Rubber Membrane must be installed on a clean, dry and structurally sound surface, free of loose or foreign material, rust, dirt, oil, grease, or other materials or debris that may damage the Liquid Rubber Membrane.

4.1 Remove heavy accumulations of oil, grease or similar substances, using solvents or detergents as necessary.

4.2 Areas of heavy pitting, limited accessibility or sharp edges may be prepared using Liquid Rubber Trowel or brush application of Liquid Rubber High Build. Allow 12 hours cure time prior to application of Liquid Rubber High Builder over Liquid Rubber Trowel Grade.

4.3 Remove heavy rust by tool cleaning with power or hand tools.

4.4 Abrasive blast steel to an SSPC-5P6 or 5P7 (commercial sweep blast). A white metal or near white metal blast is NOT required.

4.5 Wash surface to remove dust and any remaining contamination using clean water.

4.6 Allow tanks to air dry, or dry with fans.

5.0 APPLICATION

Liquid Rubber Membranes should not be applied at an air or application surface temperature below 5 ^{0}C, or where metal temperature and atmospheric conditions cause condensation on the surface of the metal. Liquid Rubber Membranes may be applied at high humidity (up to 100%), but curing time may be somewhat prolonged at higher ranges of humidity.

5.1 Apply Liquid Rubber Membranes at a dry film thickness of 40 to 45 mils.

5.2 Begin spraying from the lowest point of the tank in slow even strokes. Work upwards in horizontal steps to the highest point.

5.3 Detail Liquid Rubber Membranes around all penetrations.

5.4 Check Liquid Rubber Membranes for correct thickness in a grid pattern incorporating sections not greater than 40 m^2.

5.5 Allow three (3) days for curing of Liquid Rubber Membranes before returning the tank to service.

ROOF WATERPROOFING AND COATING SPECIFICATIONS

PART 1 GENERAL

1.1 DESCRIPTION

Applicator must provide fluid applied roofing as indicated, specified and required By Liquid Rubber Industries Inc.

Principle work in this Section **includes**:

- Cold fluid applied roof coatings on buildings

Related work **not** in this Section:

- Flashing and sheet metal
- Joint sealers

Note: "General Requirements" applies to this Section.

1.2 QUALITY ASSURANCE

Roofing Contractor/Applicator shall be trained and approved by manufacturer, Liquid Rubber Industries Inc.

A pre-installation conference shall be held prior to application of roofing membrane to assure proper substrate and installation conditions, to include contractor, Applicator, architect (engineer and special inspector (if any)).

1.03 SUBMITTALS

Project Data Submit manufacturers' product data and installation instructions for specific applications.

Sample - Submit representative samples of the following for approval:

1) Roofing membrane material
2) Base Sheet
3) Scrim
4) Top coats
5) Foot traffic pads

1.04 DELIVERY, STORAGE AND HANDLING

Deliver materials to site in original unbroken packages bearing manufacturer's label showing; brand, weight, volume and batch number. Store materials at site in strict compliance with manufacturer's instructions. Do not allow materials to freeze in containers.

1.05 JOB CONDITIONS

Protect and mask all adjacent areas from overspray. Perform work only when existing and forecasted weather conditions are within manufacturers recommendations for the material and product used. Minimum clearance of 24 inches is required for the application of product. For areas with less than 24-inch clearance, the product may be applied by hand using Liquid Rubber Trowel Grade.

Ambient temperature shall be within manufacturers specifications (greater than 45 Deg F/7 Degree C).

All plumbing, electrical, mechanical and structural items to be under or passing through the roofing membrane shall be positively secured in their proper positions and appropriately protected prior to membrane application.

1.06 PRODUCT WARRANTY

Specific provisions of the warranties are available upon request.

PART 2 - PRODUCTS

2.01 MATERIALS

Liquid Rubber Membrane is a fluid applied roofing system. Waterborne and spray to be applied at ambient temperatures. A nominal thickness of 80 dry mils (60 mil minimum) unless specified otherwise. Liquid Rubber Membrane is non-toxic and odorless.

PART 3- EXECUTION

3.01 EXAMINATION

All surfaces to be roofed shall be inspected and approved by the Applicator at least one day prior to commencing work.

3.02 SURFACE PREPARTION

Provide 24-inch minimum clearance out from surfaces to receive the roofing membrane.

The application surface shall be prepared for the Applicator in accordance with manufacturer's specifications listed below:

Concrete Roof Decks

Concrete surfaces shall be light broom finish or smooth free of any dirt, debris, and loose material, release agents or curing compounds. Fill all voids more than ¼ inch deep and ¼ inch wide. All penetrations shall be prepared in accordance with manufacturers specifications. Prepare all flashings in accordance to common roofing practice.

Wood Roof Decks
Wood surfaces shall he clean and free of dust. Plywood decking shall be ½ inch / 5-ply minimum. All plywood edges shall have solid blocking. Wood sheathing and framing must be inspected carefully for any signs of dry rot.

Replace all dry-rotted wood. Prepare all flashings in accordance to common roofing practice.

Existing Built-up Roofing
Expose a smooth application surface by removing all gravel, debris, dirt and loose material from the roof down to the existing cap sheet. Air-blast or vacuum the entire roof just prior to application. If the original roof has gravel imbedded into a tar coat, the existing roof shall be spud, scratched and vacuumed to create a smooth, clean surface. In either case, areas of previous ponding or leaking shall be cored and checked for dry rot. Replace all dry-rotted wood. Prepare all flashings in accordance to common roofing practice.

Metal Roofs
New metal shall be treated to remove any residual factory oils from the surface. Air-blast or vacuum the entire roof just prior to application. Tighten all fasteners as required. All panel joints shall be prepared by precoating with Liquid Rubber Trowel Grade (spray or troweled) as required by inspections.

Miscellaneous Metals
Exposed steel straps or other steel elements, which are to be sealed beneath the membrane, shall be clean and free of loose scale. Each steel element shall then be 3-coarsed with the following layers before application of the Liquid Rubber Roofing Membrane: 80 mils Liquid Rubber Trowel Grade, fiberglass scrim, followed by 80 mils Liquid Rubber Trowel Grade. This preparation shall extend a minimum of 6 inches beyond the steel. New metal shall be treated to remove any residual factory oils from the surface.

3.03 INSTALLATION

As Liquid Rubber Membrane is a modified emulsion, some water will be ejected as part of the curing process. All cracks or holes should be patched prior to applying Liquid Rubber Membrane. During the curing process, any ponding water must be removed to allow the membrane to properly cure. Once fully cured, the Liquid Rubber Membrane will support ponding water.

3.03.1 INSTALLATION ON CONCRETE

Due to the numerous variables affecting concrete (i.e.: water content, mix specifications, cement source, "free-line" percentage, calcium content, pumped vs poured, environmental conditions at the time of concrete placement, admixtures, acidity, type of finish, curing conditions, etc.) every job will require pre-testing of Liquid Rubber Membrane to determine the installation procedure.

Follow the procedures below carefully.

Refer to Section 3.03.6 "Sealing Around Penetrations", for procedures to seal around penetrations.

Provide a ¾ inch minimum cant of Liquid Rubber Trowel Grade, or other suitable material, at all horizontal to vertical transitions and other inside corners of 90-degree or less. Leave to cure a minimum of 24 hours before the application of Liquid Rubber Membrane.

Delineate a test area on site with a minimum dimension of 10 feet by 10 feet (3m by 3m). Apply Liquid Rubber Membrane to a thickness of 80 mills and let it cure for 24 hours. Observe for blisters. If minor or no blistering occurs, proceed to the next step. If blistering does occur, apply a thin (10-mil) tack coat of Liquid Rubber Membrane without catalyst to the concrete surface and allow to cure before proceeding (see information regarding blister repair below).

Remove all standing water before application of Liquid Rubber Membrane.

Spray apply Liquid Rubber Membrane at 80 mil nominal dry thickness (60 mils minimum). If a second coat is required, remove any standing water from the membrane before proceeding with the second application.

In all area of where recurrent traffic is expected (i.e.: equipment maintenance paths), install foot traffic pads.

NON-HORIZONTAL SURFACES
Spray on roofs and vertical surfaces, such as parapet walls, should begin at the low point (typically at the drains) and work towards the high point. This method allows the product to adhere to the surface before hitting catalyst run-off.

Note: It is normal for some blistering to occur. A small number of blister heads should be sampled and checked for proper membrane thickness. If the samples have the required membrane thickness (80 mils nominal/60 mils minimum), then the remaining blisters should not be punctured or cut. If the samples have less than the minimum 60 mils, then the area can either be resprayed to obtain the proper thickness, or the blisters can be cut out and the area resprayed or patched with Liquid Rubber Trowel Grade, to a minimum thickness of 80 dry mils over the cut-out area extending a minimum of three inches (3") beyond the cut.

3.O3.2 LIGHT WEIGHT CONCRETE ROOF DECKS

Refer to Section 3.03.6, "Sealing Around Penetrations" for procedures to seal around penetrations.

Mechanically attach 28 lb fiberglass base sheet to deck in accordance with local code.

Provide ¾ inch minimum cant of Liquid Rubber Trowel Grade, at all horizontal to vertical transitions and other inside corners of 90-degree or less. Allow to cure a minimum of 24 hours before the application of Liquid Rubber Membrane.

Fiberglass scrim may be used over the deck area if require. As the spray application begins, set the roll ends by spraying through the scrim. Then roll out the scrim ahead of the sprayer, keeping the scrim tight and wrinkle-free at all times. Overlap seams a minimum of three (3) inches. Cut all folds or wrinkles and lay flat so as not to create voids. Attach scrim tight in all corners so as not to create voids.

Remove all standing water before application of Liquid Rubber Membrane.

Spray-apply Liquid Rubber Membrane to an 80-mil nominal dry thickness (60 mils minimum) if a second coat is required, remove any standing water from the membrane before proceeding with the second application.

In all areas of where recurrent traffic is expected (i.e.: Equipment maintenance paths), install foot traffic pads.

NON-HORIZONTAL SURFACES
Spray on roofs and vertical surfaces, such as parapet walls, should begin at the low point (typically at the drains) and work towards the high point. This method allows the product to adhere to the surface before hitting catalyst run-off.

3.03.3 WOOD ROOF DECKS

Refer to Section 3.03.6, "Sealing Around Penetrations", for procedures to seal around penetrations.

Mechanically attach 28-lb fiberglass base sheet to deck in accordance with local code.

Provide ¾ inch minimum cant of Liquid Rubber Trowel Grade at all horizontal to vertical transitions and other inside corners of 90-degree or less. Allow to cure a minimum of 24 hours before the application of Liquid Rubber Membrane.

Roll out fiberglass scrim over entire deck without folds or wrinkles and staple at twelve (12) inches on center. Overlap seams a minimum of three (3) inches. Cut all folds or wrinkles and lay flat so as not to create voids. Attach scrim tight in all corners so as not to create voids.

Remove all standing water before application of Liquid Rubber Membrane.

Spray-apply Liquid Rubber Membrane to an 80-mil nominal dry thickness (60 mils (minimum)). If a second coat is required, remove any standing water from the membrane before proceeding with the second application.

In all area of where recurring traffic is expected (i.e.: Equipment maintenance paths), install foot traffic pads.

NON-HORIZONTAL SURFACES
Spray on roofs and vertical surfaces such as parapet walls, should begin at the low point (typically at the drains) and work towards the high point. This method allows the product to adhere to the surface before hitting catalyst run-off.

303.4 OVER EXISTING BUILT-UP ROOFING

Refer to Section 3.03.6, "Scaling Around Penetrations", for procedures to seal around penetrations.

On loose gravel roofs, spud, scratch and vacuum the surface. If the surface has been spud below the level of the existing cap sheet, mechanically attach 28 lb fiberglass base sheet to deck in accordance with local code. Air-blast or vacuum the entire roof just prior to application.

On existing smooth cap sheet roofs, remove all gravel and loose material. Air-blast or vacuum the entire roof just prior to application.

Provide ¾ inch minimum cant of Liquid Rubber Trowel Grade at all horizontal to vertical transitions and other inside corners of 90-degree or less. Allow to cure a minimum of 24 hours before the application of Liquid Rubber Membrane.

Roll out fiberglass scrim over entire deck area without folds or wrinkles and staple at twelve (12) inches on center. Overlap seams a minimum of three (3) inches. Cut all folds or wrinkles and lay flat so as not to create voids. Attach scrim tight in all corners so as not to create voids.

Remove all standing water before application of Liquid Rubber Membrane.

Spray-apply Liquid Rubber Membrane to an 80-mil nominal dry thickness (60 mils (minimum). If a second coat is required, remove any standing water from the membrane before proceeding with the second application.

In all area of where recurrent traffic is expected (i.e.: equipment maintenance paths), install foot traffic pads.

NON-HORIZONTAL SURFACES

Spray on roof and vertical surfaces, such as parapet walls, should begin at the low point (typically at the drains) and work towards the high point. This method allows the product to adhere to the surface before hitting catalyst run-off.

3.03.5 METAL ROOFS

Refer to Section 3.03.6 "Seating Around Penetrations", for procedures to seal around penetrations.

Provide ¾ inch minimum cant of Liquid Rubber Trowel Grade at all horizontal to vertical transitions and other inside corners of 90-degree or less. Allow to cure a minimum of 24 hours before the application of Liquid Rubber Membrane.

Remove all standing water before application of Liquid Rubber Membrane.

Spray-apply Liquid Rubber Membrane to an 80-mil nominal thickness (60 mils minimum). If a second coat is required, remove any standing water from the membrane before proceeding with the second application.

NON-HORIZONTAL SURFACES
Spray on roofs and vertical surfaces, such as parapet walls, should begin at the low point (typically at the drains) and work towards the high point. This method allows the product to adhere to the surface before hitting catalyst run-off.

3.03.6 SEALING AROUND PENETRATIONS
Clean and brush all penetrations.

Roll out and nail base sheet and scrim as required above. Base sheet and scrim should be flat around the base of the penetration. Cut base sheet and scrim as tight to the penetrations as possible.

Apply (80-mil nominal dry thickness 60-mil minimum) Liquid Rubber Trowel Grade in a six (6) inch wide ring around the penetration and up the penetration a minimum of six (6) inches.

Allow the Liquid Rubber Trowel Grade to cure completely before proceeding to the following step.

Spray-apply Liquid Rubber Membrane to an 80-mil nominal dry thickness (60-mil minimum) around the penetration, completely encapsulating the collar assembly and to a height two (2) inches minimum above the trowel grade collar. Spray-apply Liquid Rubber Membrane to surrounding areas as specified for the particular application.

3.04 FIELD QUALITY CONTROL
Field Quality Control is a very important part of all membrane applications. Applicators should check their own work for coverage, thickness, and all around good workmanship before calling for inspections.

When thickness or integrity is in question, the membrane should be tested in the proper manner as described below. However, over-sampling defeats the intent of inspections. Inspectors should always use visual and tactile measurement to guide them. Areas suspected of being too thin to the touch should be measured with the gauges to determine the exact thickness. With practice and by comparing tactile measurements with those of the gauges, fingers become very accurate tools.

3.04.01 INSPECTION METHOD #1
Membrane may be checked for coverage with a lightly oiled, needle nose depth gauge, or by taking four (4) cut-outs of one (1) square inch every five thousand (5,000) square feet. Record the minimum reading. Mark the test area.

Test areas are to be patch over with Liquid Rubber Membrane to an 80-mil minimum dry thickness, extending a minimum of one (1) inch beyond the test perimeter.

3.04.02 INSPECTION METHOD #2

Samples to be inspected may be cut from the membrane to a minimum area of two (2) square inches per five hundred (500) square feet.

Voids left by sampling are to be patched with fiberglass and must overlap the void by a minimum of two (2) inches. Spray or trowel-apply Liquid Rubber Membrane to an 80-mil minimum dry thickness, extending at least three (3) inches beyond scrim patch.

Note: Due to the nature of concrete as a substrate it is normal for some blistering to occur. This is caused by either the concrete's tendency to off-gas when sealed, or water that is temporarily trapped between the concrete and the membrane. With time blisters will absorb into the concrete without detriment to the membrane.

A small number of blister heads should be sampled and checked for proper membrane thickness. If the samples have the required membrane thickness (80-mil nominal/60-mil minimum), then the remaining blisters should not be punctured or cut. If the samples have less than the minimum 60-mils, then the area can either be re-sprayed to obtain the proper thickness, or the blisters can be cut out and the area re-sprayed or patched with Liquid Rubber Trowel Grade.

TYPICAL LIQUID RUBBER MEMBRANE APPLICATION NOTES

APPLICATION TECHNIQUE

The Membrane shall be spray applied in liquid form and air cured to form a seamless film.

The application shall be via a plural component spray gun and delivery equipment as approved by Liquid Rubber Industries.

The Membrane System shall be supplied and installed by an approved Applicator.

The spray gun and associated delivery equipment shall be set up such so that the separate emulsion and catalyst are combined in two even fan patterns with no precipitation of either component. It shall produce a non-liquid coating exhibiting a finely textured surface with the characteristic of uniformly releasing the water carrier contained within the emulsion. The Applicator shall avoid overbuilding the Membrane beyond 5 mm without interlaying a layer of reinforcement fabric.

CURING

The nominal standard curing time is 48 hrs at 20^{o}C.

PROTECTION OF WORKS

The works shall be barricaded to prevent pedestrian or vehicular traffic.

The membrane Applicators shall attend and control their work until wear protection overlays are installed complete.

REINFORCEMENT / PROTECTION

Immediately upon completion of the membrane application, a covering layer of geo-textile reinforcement shall be laid level to promote adhesion to the membrane and be followed by such protective sheeting, overcladding, or coating as specified.

Insulation (if required): Cover all membrane surfaces both horizontally and vertically with high density polystyrene foam panels, 10 mm gap fitted to cover the entire roof membrane and aligned to facilitate roof drainage.

REPAIRS

If the membrane suffers damage it shall be repaired by repeating the application process and overlapping the damaged area that has been trimmed and cleaned.

GENERAL NOTES

The Works Contractor shall provide works access, and site safety practices to avoid endangering the waterproofing Applicator, the passing public, and the building tenants.

STANDARD SURFACE SPECIFICATION

1.0 PREPARATION

Membrane substrate surfaces must be clean and free of debris. The surface must be free of wax, oil, and contaminants, and offer an unpolished, non-slippery, fine textured uniform base to the proposed Membrane, **(EQUAL TO BULL FLOAT FINISHED 90 SLUMP CONCRETE)**. Proper surface preparation may require de-oiling, de-waxing, laitance removal, etching, shot peening, blast cleaning, crack filling, remedial fill topping, or adhered grade topping, as necessary.

2.0 BLOCKWORK

All block work to be flushed jointed with no holes left in mortar joints.

3.0 CONCRETE

Free from voids, bony surfaces or metal protrusions. Surfaces are to be free from curing agents, form release agents or chemicals that would interfere with the bonding capacity of the curing membrane to the substrate.

4.0 INTERNAL CORNERS

Applicator must form 20 mm x 20 mm coved corners.

5.0 EXTERNAL CORNERS

Built up.

6.0 PENETRATION

- All penetrations to be minimum of 20 mm from parallel surface.
- Dual penetrations to be a minimum of 20 mm apart.
- All pipe penetrations to be tightly secured prior to membrane application.
- All wastes and or overflows to be flushed to enable application of membrane.
- All penetrations are to be sleeved, directed and / or fixed (i.e.: incapable of independent movement).

7.0 NOTATION

A minimum of 600 mm working space is required behind all walls. All surfaces to be applied with Liquid Rubber must be clear and free from non-structural or architectural structures. Surfaces not prepared as specified above may void warranty and / or incur site approval visit charges from Liquid Rubber Industries Inc.

RMS: OFF-FORM CONCRETE WALLS OR SLABS

1.0 GENERAL

The following is a typical specification for the Liquid Rubber Membrane system when applied as a coating or new membrane to off-form concrete walls as the waterproofing medium in below grade walls. Each project will have special conditions and these should be identified and addressed additional to this specification. If in doubt, seek the advice of Liquid Rubber Industries Inc. before proceeding.

2.0 QUALITY ASSURANCE

2.1 The Liquid Rubber Membrane system may only be applied by a qualified licensed Liquid Rubber Industries Inc. Applicator.

2.2 A pre-installation conference, to include at least the contractor, Applicator and architect/engineer should be held prior to application to ensure proper substrate and conditions.

3.0 INSPECTION

Prior to commencement of work, a thorough inspection of the deck surface should be carried out to determine or confirm the following:

3.1 Identify the exact detailing and relative level, determining the design requirements of the membrane system.

3.2 Complete exposure to the total depth arid all other concrete surfaces to allow application of the Liquid Rubber Membrane system to the extent shown on the design drawings.

3.3 Soundness and correctness of pipe and other penetrations. This requires these penetrations be grouted in flush to the concrete free of voids and clear of slab by minimum of 50 mm.

3.4 Inspect and accept substrate as provided.

4.0 PREPARATION

The Liquid Rubber Membrane System must be installed on a clean, dry and structurally sound surface, free of sharp edges, loose or foreign material, dirt, oil, grease or other materials or debris that may damage the Liquid Rubber Membrane system.

4.1 Use of curing and release Agents: These should be avoided where possible. If required non-oil based types are preferred. All use of curing and release agents should be identified for type and referred to Liquid Rubber Industries Inc. for appropriate preparation requirements.

4.2 Substrate preparation Applicators should identify the requirements for off-form concrete, as specified by class and imposed on concrete contractor. Determine minimum acceptable level.

4.3 Liquid Rubber Membrane System can be applied to off form concrete walls in little as 24 hours from constructing. However this should be done only if they are intended to be back-filled immediately. Due to the impervious/fully bonded nature of Liquid Rubber Membrane System in this application it is normal to expect vapour blisters. These blisters are increased proportionate to the residual moisture in the concrete and are, in all cases of no consequence to the Liquid Rubber Membrane. Once the heat source is insulated by, first protection board and finally backfilling, all entrapped moisture vapour will take the path of least resistance and dissipate through the non-membrane faces of the wall.

If minimal to no blisters is desired, 28 days curing of concrete should proceed the application of the Liquid Rubber Membrane System.

4.4 Using a stiff bristle brush or similar, fully expose a minimum of 50 mm clear area onto the footing at base. Sweep any sand, dirt or other debris from the wall and footing to allow the installation of Liquid Rubber Membrane to clean surfaces and a well-defined work area.

4.5 Chip, grind or otherwise remove all concrete sharps, fins and other irregularities. Patch concrete surfaces using a sand and cement mixture and bondcrete to fill all void spaces.

4.6 Smooth sharp irregularities in wall contours, i.e.: vertical/horizontal contours left by form ply sheet edges.

4.7 Install 20 mm x 20 mm fillets to all 90-degree up-turns and penetrations.

4.8 Mask all areas as needed for protection from over-spray. Mask terminations to a straight line.

5.0 APPLICATION

5.1 Liquid Rubber Membrane System for this application to be applied at a thickness between 2 mm to 3 mm.

5.2 Begin spraying from the footing to the highest point in slow even strokes. Spray a thickening of material (twice the system thickness) to all expansion and construction joint, as well as all 90-degree transitions. This thickening should also extend a 150 mm either side of the corners.

5.3 Check Liquid Rubber Membrane System for correct thickness in a grid pattern that incorporates sections not greater than 10 m^2.

5.4 Following the completion of application and Quality Assurance checks, Liquid Rubber Industries Inc. recommends the installation of a protective geo-fabric (M12) with selected back-fill.

The Liquid Rubber Membrane System shall be spray applied in liquid form and air cured to form a seamless film.

The application shall be via a plural component spray gun and delivered equipment as approved by Liquid Rubber Industries Inc.

The Membrane System shall be supplied and installed by an approved Liquid Rubber Industries Inc. Applicator.

The spray gun and associated delivery equipment shall be set up such so that the separate emulsion and catalyst are combined in two even fan patterns with no precipitation of either component It shall produce a non liquid coating exhibiting a finely textured surface with the characteristic of uniformly releasing the water carrier contained within the emulsion. The Applicator shall avoid overbuilding the Membrane beyond 5 mm without interlaying a layer of reinforcement fabric.

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PROTECTION OF WORKS
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The membrane Applicators shall attend and control their works until wear protection overlays are installed complete.

REINFORCEMENT / PROTECTION
Immediately upon completion of the membrane application, a covering layer of geo-textile reinforcement shall be laid level to promote adhesion to the membrane and be followed by such protective sheeting overcladding, or coating as specified.

Insulation (if required): Cover all membrane surfaces both horizontally and vertically with high density polystyrene foam panels, 10 mm gap fitted to cover the entire roof membrane and aligned to facilitate roof drainage.

REPAIRS
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