APPLICATION INSTRUCTIONS
ram-Tough 250 SM

GENERAL:

These instructions are intended as a general guide to safe and proper product storage, handling and application of the **ram-Tough** 250 SM System.

SCOPE:

These instructions cover **ram-Tough** 250, **ram** Primer/Surface Conditioner, **ram** Flash 327 HDR sheet reinforcements and incidental heating & application equipment.

PRECAUTIONS AND SAFETY:

All workmen should familiarize themselves with container labels, data sheets, application instructions and "Precaution and Safety" data before commencing work. **ram** Primer/Surface Conditioner requires adequate ventilation during application. Apply only in wide open areas; avoid breathing solvent vapors and kettle fumes.

ram Primer/Surface Conditioner is a combustible liquid; keep away from sparks, heat and open flames. **ram** Primer/Surface Conditioner contains petroleum distillates. If ingested, do not induce vomiting; consult a physician immediately. If eye contact occurs, flush with water for several minutes; consult a physician immediately.

When heating **ram-Tough** 250, use an oil-jacketed kettle specifically designed for heating hot-applied rubberized asphalt materials. Do not apply an open flame to **ram-Tough** 250. Protective clothing is required by OSHA regulations when applying **ram-Tough** 250 to prevent burns.

RELATED WORK BY OTHERS:

Concrete must have been cured no less than 28 days by means of water, burlap or polyethylene sheet. Do not use liquid curing compounds or calcium chlorides unless approved in writing by the Barrett Company and the curing compound manufacturer.

ram-Tough 250 must not be applied over concrete of less than 2500 PSI or concrete incorporating lightweight aggregates, unless approved in writing by Barrett and the concrete manufacturer.

Metal pan decks must be vented.

Concrete surfaces to be waterproofed shall be free of excessive roughness, with a clean, dry surface. All honeycombs, voids, cracks and pockmarks shall be patched with non-shrinking grout applied with a bonding agent.

Vertical surfaces with form voids or pockmarks should be repaired by packing after repair of honeycombed areas. Surface must be free of all loose mortar. All tie-ends on foundation walls must be cut off flush with the wall surface and repaired with a non-shrinking grout and a bonding agent.

All surfaces to be waterproofed must be free of grease, oil, laitance, loose aggregate, form release, curing compounds, dirt and other contaminants.

Metalwork must be in place, securely attached and accurately fitted. It is very important that the metal be cleaned of all process oils with a solvent cleaner and that it be free of rust and other contaminants. Wire brush to a bright metal finish prior to priming.

Reglets, if required, shall have been provided as specified in the plans.

SURFACE INSPECTION:

Prior to commencing work, the Applicator should inspect surfaces and areas of work provided by other trades and shall find them to be fully acceptable. The Owner, Architect and General Contractor shall be notified of unacceptable conditions and work shall be performed to correct conditions prior to Applicator commencing work within an affected area. No work shall be undertaken until all adverse conditions are rectified.

ENVIRONMENTAL CONDITIONS:

The waterproofing installation may take place when the ambient temperature is above minimum 0°F. Special application procedures shall be followed below 30°F; consult Barrett. All surfaces to be waterproofed must be thoroughly dry at the commencement of any work.

HEATING EQUIPMENT:

Use double-jacketed, oil bath kettles with mechanical agitation, specifically designed for applying hot-applied, rubberized asphalt materials. Melter must be capable of maintaining material temperature at 375°F to 400°F and an oil-bath temperature of 500°F to 550°F. Consult kettle manufacturer for specific information. Kettle shall be similar to the Crafco **ram** E-Z Pour Melting Kettle, manufactured by Crafco Manufacturing Co.; Phoenix, AZ.

HEATING **ram-Tough** 250:

The melter must be operated by a workman thoroughly familiar with equipment. Check heat transfer oil level daily before starting burners. Allow sufficient space for thermal expansion. Replace with heat transfer oil as recommended by melter manufacturer.

Melter must be free of foreign materials. Begin melter warm-up two hours prior to material installation, cold weather start-up may take longer. Start-up LP gas burners and add 7-8 cubes of **ram-Tough** 250 cut into quarters. Discard the outer polyethylene wrapper. The inner polyethylene wrapper may be added with material. When material is molten, start agitator drive motor. Add **ram-Tough** 250 cut into half, sufficient to maintain melter at about 3/4 capacity. Replace material throughout the day as it is withdrawn from the melter. Each cube is equal to about three fluid gallons.

Maintain oil-bath at approximately 500˚F and material temperature at 375˚F to 400˚F, with constant agitation. Do not overheat **ram-Tough** 250. Overheating will cause **ram-Tough** 250 to cross-link and line the walls of the kettle, adversely affecting the material performance properties. Discard all overheated materials off site in conformance with applicable environmental regulations. It is also important not to hold **ram-Tough** 250 material at elevated temperatures for prolonged periods of time as this will also cause degradation. A target of maximum four hours under heat should be adhered to.

PREPARATORY WORK:

1. Projections

   Exposed metal projections and surfaces shall be cleaned with a power wire brush and a solvent wash and then primed with **ram** Primer/Surface Conditioner and allowed to dry tack-free. Install a 1 inch cant of **ram-Tough** 250 as shown in drawings to extend from the primed metal 12 inches on to the deck. Allow the hot **ram-Tough** 250 to cool somewhat and tool into place with a trowel. Re-coat and install **ram** Pipe Boot or a two (2) piece **ram** Flash 327 HDR Flashing Sheet, base portion first or primed sheet metal sleeve flashing.

2. Flashings

   Install a flashing of **ram-Tough** 250 and **ram** Flash 327 HDR elastomeric sheeting wherever a vertical surface or change in plane (such as parapet wall, concrete column, etc..) exists. The flashing height should be determined by the Architect. The minimum required height is 8 inches. Prime the area to the specified height

and a minimum of 10 inches onto the deck; allow to dray tack-free. Use masking paper as required to avoid staining of adjacent surfaces. Take precautions to avoid wind-carried overspray from damaging adjacent surfaces. Bond laps in the sheet a minimum of 6 inches in width with 1/8 inch thickness (125 mils) of hot **ram-Tough** 250. Apply 1/8 inch of **ram-Tough** 250 a minimum of 8 inches in width to the horizontal plane and 8 inches on the vertical plane of the flashing and immediately lay the sheet into the material on the horizontal surface and embedded tight into the cove, following up the vertical surfaces and while the material is still hot. Sheeting must be fully adhered a minimum of 6 inches on the vertical and free of wrinkles and fishmouths and tightly embedded 100 percent. Use a hot roller or squeegee to apply 3/16 inch thickness (180 mils) of **ram-Tough** 250 over the entire assembly. The neoprene must be tightly pressed into the cove area. Neoprene flashing with void space below it is unaccepted and must be cut and reflashed.

3. Cracks

Treat cracks less than 1/16 inch in width by priming with **ram** Primer/Surface Conditioner 5 inches to either side of the crack. As soon as the primer has dried tack-free, apply a 1/8 inch thickness of **ram-Tough** 250 3 inches from each side of the crack.

Treat cracks 1/16 inch to 1/4 inch by priming with **ram** Primer/Surface Conditioner 8 inches to either side of the crack. As soon as **ram** Primer/Surface Conditioner has dried tack-free, apply a 1/8 inch thickness of **ram-Tough** 250 and embed a minimum 6 inch wide **ram** Flash 327 HDR elastomeric sheeting into hot **ram-Tough** 250. The sheet must extend 3 inches to either side of crack and be free of fishmouths. Lap separate lengths of **ram** Flash 327 HDR sheeting a minimum of 3 inches and adhere with 1/8 inch thick hot **ram-Tough** 250.

4. Cold Joints and Construction Joints

At cold joints and construction joints, remove any premolded joint filler to a minimum depth of 1/2 inch. Prime 8 inches to both sides of the joint with **ram** Primer and allow to dry tack-free. Apply 1/8 inch thickness of **ram-Tough** 250 to one side of the joint, a minimum 6 inches in width. Immediately embed one half of a 12 inch width of **ram** Flash 327 HDR while material is hot. Embed the other half of the sheet likewise on the other side of the joint. The sheet must be fully adhered and free of wrinkles and fishmouths. With a hot roller or squeegee,

apply a 3/16 inch (180 mils) thickness of **ram-Tough** 250 over the entire assembly.

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5. Expansion Joints

Expansion joints shall be treated by applying **ram** Primer/Surface Conditioner a minimum of 18 inches to either side of the joint. Allow to dry tack-free. Select the **ram** Flash 327 HDR elastomeric sheeting size that, upon final installation, will provide a minimum 12 inch width of sheeting bonded to each side of the joint. If necessary, join the lengths of sheeting to equal the length of the joint, allowing a minimum 6 inches for each end-lap in the sheets. Bond each end-lap in the sheet, a minimum 6 inches in width, with 1/8 inch thickness hot **ram-Tough** 250 prior to installing in the joint. Bond the **ram** Flash 327 HDR elastomeric sheeting with 1/8 inch thickness of hot **ram-Tough** 250 to one side of the joint, a minimum 12 inches in width. Loop the sheet down into the joint to a depth equal to 1-1/2 times the joint opening at maximum anticipated movement, as indicated by the drawings. Bond the **ram** Flash 327 HDR elastomeric sheeting likewise to the other side of the joint.

Coat the entire assembly with 3/16 inch (180 mils) of hot **ram-Tough** 250 and fill the loop flush with the deck with **ram-Tough** 250.

Install a 1 inch (or as recommended) open-cell polyurethane foam rod into the joint and allow to protrude 1/2 inch or as recommended. Install second sheet of **ram** Flash 327 HDR over the foam rod being careful not to touch the foam rod with the hot **ram-Tough** 250. The sheet should be loosely laid over the foam. Overcoat the flat portion of the neoprene; do not coat the bulb over the foam rod.

Always consult your Barrett representative for specific design requirements or questions concerning proper installation.

<u>FULL MEMBRANE INSTALLATION:</u>

1. **ram** Primer/Surface Conditioner Application

Substrates must be free of dust, debris, rust, oil, laitance and other contaminants. Deck shall be cleaned with power blower and filtered air compressor just prior to **ram** Primer/Surface Conditioner installation. (CAUTION: Unfiltered air

compressors often blow out oil and moisture condensation which will act as a bond breaker.)

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Apply **ram** Primer/Surface Conditioner at a rate of 200-600 square feet per gallon, depending on the roughness and porosity of the concrete. Primer/Surface Conditioner should be applied by Hudson type garden spray. Mask all adjoining surfaces and avoid overspray. Avoid high wind applications unless adequate precautions are instituted.

Apply **ram** Primer/Surface Conditioner to all surfaces to receive **ram-Tough** 250. All previously primed areas must be lapped 12 inches with fresh primer. **ram** Primer/Surface Conditioner must be allowed to dry tack-free before applying **ram-Tough** 250. Allow to dry. Drying time will vary depending on the temperature and sunlight.

ram Primer/Surface Conditioner should present a non-uniform mottled brown appearance. Do not prime more than will be covered in the same day. Reprime all areas which have been contaminated by dust or debris.

Clean equipment with Xylol or similar solvent cleaner.

2. **ram-Tough** 250

The preparatory work to all surfaces, cracks, joints, flashings, etc.., must be completed as outlined and the primed areas must be allowed to dry to a tack-free condition before the **ram-Tough** 250 membrane is installed.

Draw material from melter in 5 gallon pails. **ram-Tough** 250 may be poured into place and spread evenly with a squeegee or roller mop, such as manufactured by American Associated Company, Inc., Atlanta, Georgia. Do not allow the material to cool before spreading because of rapid thermoplastic set.

Alternatively, fill hot **ram-Tough** 250 into a 20 to 30 gallon "mop cart" type container. Use a squeegee or hot roller mops to apply the material. Several passes may be required with a roller, but a more uniform thickness may be obtained. The roller mop method is preferred for foundation walls.

Apply the **ram-Tough** 250 an average of 3/16 inch thickness (180 mils) with an absolute minimum of 1/8 inch thickness (125 mils) to the substrate and preparatory work in place. Application shall be made in strict accordance with the recommendations of the manufacturer.

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Perform adhesion test and thickness test once every hour. Do not proceed if inadequate adhesion is evident. If inadequate thickness is a problem reduce melter temperature and, using a chalk line, grid out the deck in 8 foot x 8 foot grids. Two 5 gallon buckets (with net 4 gallons of material each) used per grid area should provide adequate coverage under normal conditions. One pound **ram-Tough** 250 equals 160 mils on a perfectly flat surface; one gallon **ram-Tough** 250 weighs approximately 10 lbs.

WATER TESTING:

It is recommended that prior to installation of protection board or insulation, completed membrane installation or sections thereof should be tested with 2 inches of water for 48 hours. Any leaks should be repaired and the area is to be retested. This test is a requirement with many warranty applications.

PROTECTION COURSE:

Following the water test, an approved 1/8 inch thick asphalt impregnated protection course material such as Barrett **ram** 201 or **ram** 203 protection course must be laid to protect the membrane from backfilling operations, traffic by subsequent trades, etc. Overlap sidelaps by 2 inches and 6 inch endlaps. Butt joints are not acceptable. Use **ram-Tough** 250 as adhesive as required. Protection course may be laid up in hot **ram-Tough** 250 if no water test is made.

It may be necessary to ballast the protection course or "spot adhere" it in place with **ram-Tough** 250 to prevent wind blowoff. Do not leave protection course exposed for more than 14 days.

On protected membrane assemblies where the insulation is to be installed immediately following the membrane application, install a 4 mil layer of polyethylene sheet, overlapping seams by 6 inches to prevent insulation from sticking to the membrane.

Follow up with insulation, filter fabric and ballast.