

GUIDE SPECIFICATIONS

**SECTION 07120
HOT POLYMERIC FLUID APPLIED WATERPROOFING
FOR VERTICAL WALLS AND PLANTERS
RAM-TOUGH 250 SM / RAM 400PS**

PART 1 - GENERAL

1.00 GENERAL

The general conditions, special conditions, applicable portions of Division 1 and requirements for general construction and subtrades form part of this specification.

1.01 RELATED SECTIONS

- Section 02050 Demolition
- Section 03300 Concrete
- Section 04100 Masonry
- Section 06100 Carpentry
- Section 07600 Sheet Metal
- Section 07900 Caulking & Sealants

1.02 SCOPE

The Work includes supplying all materials, labor and equipment to complete the installation of the Hot Polymeric Fluid Applied Double Membrane Waterproofing System for the following areas:

Planters, foundation walls and elsewhere as shown.

1.03 QUALIFICATIONS

The Waterproofing System shall be installed only by an Applicator approved and licensed by the Manufacturer. Polymerized bitumen and reinforcing sheet shall be supplied by the same firm to insure single-source responsibility. Materials supplied for installation will be tested by an independent laboratory to guarantee compliance with published physical

properties.

The Manufacturer shall have a minimum of ten (10) years documented experience with the system specified herein.

1.04 SUBMITTALS

- A. Submit Manufacturer's written approval or license of applicator for installation of the herein specified Waterproofing System.
- B. Submit Manufacturer's sample Fifteen Year Labor and Material System Warranty and Manufacturer's Intent to Warranty Certification for this project.
- C. Submit most recent copy of Manufacturer's literature applicable to products and specifications to be used, as specified herein, including applicable flashing details.
- D. Submit three sample sheets of neoprene flashing material and the sheet membrane material.
- E. Submit three samples, approximately 8 inches x 10 inches, of the drainage board (optional).
- F. Submit three samples of elastomeric bitumen.
- G. Submit evidence of Manufacturers history of production for the system specified herein. A minimum of ten (10) years experience is required. Documentation shall include job lists with project size, Architect of record, installing Applicator, telephone numbers and contact names.
- H. Submit, in duplicate, certification from the primary Manufacturer, properly attested by a corporate officer, stating that all materials being supplied comply with the specifications and requirements of the contract documents, including conformance with all federal, state and local building codes including United States Code Section 41:10, Subsections a-d, popularly known as the "Buy American Act".

1.05 QUALITY ASSURANCE

All the materials specified herein are cited as a minimum standard of quality and shall not preclude consideration of equal or superior materials. All suggested "equivalent materials" or other substitutions are to be submitted to the Architect for consideration a minimum of ten (10) days prior to the bid date. Submittal shall include all evidence of compliance or superiority of material from the proposed substitute Manufacturer. If accepted by the Architect, an addendum will be issued to all bidders for their consideration of the proposed

substitute Manufacturer. Determination of equivalency of all substitutions shall rest exclusively with the Architect and such decision shall be final.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store materials under provisions of General Conditions Section.
- B. Deliver materials to jobsite on pallets. Package labels shall indicate material name, production date and product code.
- C. Store materials in dry, protected areas in an upright position. Control temperature of storage areas in accordance with Manufacturer's instructions. Protect materials from moisture with breathable tarps on sides and top surfaces.

1.07 PROJECT CONDITIONS

- A. Follow local, state & federal regulations, safety standards and codes. When a conflict exists use the stricter requirement.
- B. Do not apply waterproofing materials unless proper bitumen application temperatures (approximately 350°F-400°F) can be maintained, or when moisture in any form (i.e. rain, dew, ice, frost, snow, etc.) is present on the deck. Do not heat bitumen above 400°F.
- C. Ensure deck is structurally sound to support the live and dead load requirements of the waterproofing system and sufficiently rigid to support construction traffic.
- D. Sequencing and Scheduling: The work shall be scheduled in the construction sequence so that designated complete contiguous areas can be installed and completed, including overlay wear courses, before other construction trades are allowed in the area. Prior to starting the Work, all drains shall be operative and all deck projections, sleeves and all other penetrations shall be installed, in place and operative.

1.08 CODE COMPLIANCE

It shall be the Applicator's responsibility to ensure that all the Work done under this project shall be in compliance with applicable code requirements including obtaining any required permits prior to the start of the Work.

1.09 WARRANTY

Supplier of the Waterproofing System shall furnish its standard Ten Year Warranty for labor

and materials, including the membrane, membrane flashings, protection course, drainage medium and concrete pavers, where present.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

Products manufactured or accepted by the Barrett Company, or Architect approved equal.

2.02 MATERIALS

A. Waterproofing Membrane:

1. Hot Polymeric Waterproofing: **ram-Tough 250** SBS Kraton® modified bitumen shall have inert mineral stabilizer. Material shall comply with the following specifications:

<u>TEST RESULTS</u>	<u>CGSB 37-GP-50M REQUIREMENTS</u>	<u>TYPICAL TEST RESULTS</u>
Flash Point, °C	Min. 260	327
Penetration, 0.1 mm	Max. 110 @ 25°C Max. 200 @ 50°C	83 165
Flow, mm	Max. 3	0.5
Toughness, J	Min. 5.5	11.7
Ratio of Toughness, J/N to Peak Load	Min. 0.040	0.059
Adhesion	Min. 1	1
Water Vapor Permeance ng/Pa.s.m_	Max. 1.7	0.39
Water Absorption, g	Loss 0.18 Gain 0.35	0.22+
Crack Bridging @ -25°C		No delamination No loss adhesion

Heat Stability @ 200°C	Max. 110 @ 25°C	No cracking 80
Penetration, 0.1 mm	Max. 200 @ 50°C	155
Low Temp Flex @ -25°C		No delamination No loss adhesion No cracking
Viscosity, s	Min. 2	5
@ 200°C	Max. 15	

2. Sheet Membrane: ram 400PS, A polyester reinforced SBS polymer-modified self-adhering sheet shall comply with the following minimum specifications:

<u>TEST</u>	<u>METHOD</u>	<u>TYPICAL TEST RESULTS</u>
Thickness	ASTM-D-412	1.5 mm (60 mils)
Breaking Strength	ASTM-D-412	50 lbs./in.
Elongation	ASTM-D-412	25%
Puncture Resistance	ASTM-E-154	80 lbs.
Cold Bend (180° bend over 1" mandrel)	ASTM-D-146	-15°F

3. Uncured Neoprene Flashing Sheet: ram Flash 327 HDR Sheet, shall comply with the following minimum specifications:

<u>TEST</u>	<u>METHOD</u>	<u>TYPICAL TEST RESULTS</u>
Thickness Tolerance, %	ASTM D-412	±10
Specific Gravity	ASTM D-297	1.48 ±.05
Tensile Strength min, psi (Mpa)	ASTM D-412	1500 (10.3)

Elongation, Ultimate min, %	ASTM D-412	250
Hardness, Curometer, A Tear resistance min, 1 bf/in (kN/m)	ASTM D-2240	60 ±10
	ASTM D-624	120 (21.0) (Die C)
Brittleness Temperature, max, F(deg C)	ASTM D-746	-30 (-34)
Flame Resistance	ASTM C-542	Must not Propagate flame
Resistance to Heat Aging Properties after 70 h at 212°F Hardness increase max.	ASTM D-573	+ 10
Resistance to Oil Aging Change in Volume, max after 70 h Immersion in ASTM Oil #3 at 212°F	ASTM D-471	+ 80%
Ozone Resistance Condition after Exposure to 100 pphm Ozone in Air for 100 h at 104 F (sample under 20% strain)	ASTM D-1149	No cracks
Resistance to Water Change in Mass, max, after 7 days Immersion at 158°F	ASTM D-471	+ 10%
Water Vapor Permeance (perms)	ASTM E-96	.07

B. Related Materials:

1. Primer: **ram Primer/Surface Conditioner**, shall comply with ASTM D-41 requirements.
2. Drainage Mat: ram-Drain installed in accordance with Manufacturer instructions.
3. Nails and Mechanical Fasteners: As specified by the fastener Manufacturer for specific application and approved by membrane Manufacturer.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Remove trash, debris, grease, oil, water, moisture and other contaminants from the substrate which may affect bond of bitumen to substrate surface.

Optional:

Sand-blasting and/or shot-blasting procedures may be required on certain renovation work to provide the best possible surface. If required, provide unit price per square foot in bid documents.

- B. Condition of Surface: Any new concrete surfaces shall be wood float finish ACI301-11.7.3 or better. All concrete shall have cured for a minimum of 28 days or, alternatively, pass the NRCA deck dryness test. All surfaces shall be dry, clean, firm and free from laitance, frost, dust, dirt, oil, unapproved curing compounds or other foreign matter detrimental to performance of the waterproofing membrane. The Applicator shall certify no wax base curing compounds have been used.

Before commencing work, examine all areas and report in writing to Architect and manufacturer any conditions that will adversely affect successful installation. Do not begin work until the conditions have been corrected. Voids, cracks, holes and other damaged surfaces shall be repaired with materials compatible with **ram-Tough 250**. On existing concrete surfaces, all old existing membrane and flashings shall be completely removed to bare concrete.

- C. Expansion Joints: Expansion joints shall be sharply formed and free of broken edges or loose aggregate and completely free of preformed joint fillers, sealants or back-up materials to a depth that is at least twice the width of the joint. Curb expansion

joints at each side of the joint, either by integrally forming with the slab or securely fastening sulfate treated wood strips to deck. Chamfered edges are required.

- D. Verify concrete surfaces are properly cured, dry and reasonably smooth. Prepare other surfaces according to respective Manufacturer's published instructions. Use cleaning materials and methods necessary to render an acceptable dust free surface, including oil free filtered compressed air or high speed power blowers. Protect adjacent areas from damage with tarpaulin or other durable materials.
- E. No protection from the weather is necessary for **ram-Tough 250**, but temporary protection to installed membrane is required to prevent damage by mechanical gouging, scraping, spilling of oil or solvents or excessive heat.
- F. Delivery and Storage: Deliver and store materials undamaged in original containers with Manufacturer's labels and seals intact.

3.02 INSTALLATION

- A. Surface Conditioner: Each day, prior to application of **ram-Tough 250**, apply surface conditioner, as a fine spray, at a rate of approximately 1 gallon per 300-600 square feet. Allow to dry completely tack free. Do not allow primed surface to be contaminated with construction debris or dust barrier. Re-prime and allow to dry as may be required by job conditions.
- B. Application: Units of **ram-Tough 250** shall be melted in an approved double jacket melter under continuous agitation until material can be drawn free-flowing and lump-free at a temperature of approximately 350°F - 400°F. The ram-Tough 250 shall be applied at a rate to provide a continuous coating with a minimum thickness of 90-125 mils. In a application pass exceeding the width of the ram 400 PS sheet.
- C. Installation of Sheet Membrane: Precut membrane to desired lengths. Apply membrane in lengths up to 8 feet. Apply the membrane to the ram Tough 250 while it is warm and tacky. Press firmly in place. On higher walls apply membrane in two or more sections with the upper sheet overlapping the lower sheet by at least 2-1/2 inches. Roll all membrane with a steel hand roller.

At the top terminations, press the membrane firmly to the wall with the butt end of a hardwood tool such as a hammer handle and secure with a termination bar. Seal all laps with a troweling of ram Mastic or hot ram-Tough 250 before the end of each work day.

3.03 FLASHING

Install **ram Flash 327HDR** with hot fluid **ram-Tough 250**, 125 mils thick, at all changes of plane, penetrations, all cold joints, cracks and as indicated on the drawings. Overcoat the neoprene flashing with a second 125 mil coat of **ram-Tough 250**.

Application width of neoprene flashing sheet shall be a minimum 6 inches total, minimum 3 inches in any single direction.

Flash foundation footings before application of vertical wall waterproofing

3.04 CRACK TREATMENT

At all cracks and construction joints, apply **ram-Tough 250**, 125 mils thick, then center a 6 inch wide strip of **ram Flash 327 HDR** neoprene flashing over the joint or crack and embed into the warm **ram-Tough 250**. Avoid air pockets. Allow assembly to cool. Reinforcement and flashing should be installed before the continuous, unbroken thick film of **ram Tough 250** is applied over the entire roof surface and flashing areas in accordance with specification in Section 3.02.

3.05 EXPANSION JOINTS

Over expansion joints, up to 2 inches in width with a designed total movement of 50% or less, **ram Flash 327 HDR** neoprene flashing shall be placed over the joint as shown on the drawings and embedded into a 125 mil thick coating of **ram-Tough 250**. The sheet shall be looped into the joint 1-1/2 times the joint width at maximum opening and extend 8 inches onto the deck on each side of the joint. The sheet shall be covered with **ram-Tough 250**. Install 1-1/2 inch foam rod and second sheet of neoprene flashing looped over the foam rod. Extend sheet 12 inches onto the deck on each side of the joint. Overcoat flange on each side.

3.06 WATER TEST

Water testing of vertical walls are not required.

3.07 DRAINAGE MAT

Remove exterior release paper of RAM 400 PS and install **ram-Drain** over the completed waterproofing membrane.

3.08 FIELD QUALITY CONTROL

- A. Adhesion Tests and Thickness Tests shall be monitored by the Applicator every hour throughout the application process.
- B. Test Cuts shall be made at locations of Architect's or Manufacturer's request:
 - 1. Remove one 12 inch x 12 inch unsurfaced cut per 100 squares of deck area.
 - 2. Follow field audit criteria outlined by ASTM Standards.
 - 3. Send roof cuts to: Structural Research, Inc., Madison, Wisconsin, or Manufacturer approved accredited laboratory for laboratory examinations. Applicator shall allow \$500.00 for testing fees per 100 squares of roof area. Laboratory results shall be submitted by the laboratory directly to the Architect.
 - 4. Repair sampled areas by filling in the cut-out area then use a "feathered in" patch consisting of Poly•Felt 125 VP and **ram-Tough** 250 following the Manufacturer's and NRCA procedures.
- C. Correct any deficiencies in the deck membrane, if any, (determined by deck cut analysis) as prescribed by material Manufacturer and approved by the Architect.

3.09 CLEANING

- A. Remove equipment, trash, debris and any excess material from the jobsite.
- B. Repair damage and remove any stains caused by work of this Section.

3.10 PROTECTION

General Contractor shall protect finished deck areas from damage during subsequent construction.

MAINTENANCE:

Semi-annual inspections and a systematic maintenance program are recommended to the Owner and Architect. Consult your Barrett Representative or Barrett Approved Applicator for further information.