

GUIDE SPECIFICATIONS

**SECTION 07-55-56
BLACK PEARL
COLD RUBBERIZED ASPHALT WATERPROOFING
BP-2-PMR WITH PAVERS**

PART 1 - GENERAL

1.01 RELATED SECTIONS

Section 02 41 19	Demolition
Section 04 01 00	Masonry Repair
Section 06 10 00	Carpentry
Section 07 22 00	Roof Insulation
Section 07 60 00	Sheet Metal
Section 07 72 00	Roofing Accessories
Section 07 92 00	Caulking and Sealants

Edit to project
conditions

1.02 SUBMITTALS

- A. Submit Manufacturer's written approval or license of Applicator for installation of the herein specified roofing system.
- B. Submit Manufacturer's sample 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 sheet samples each, of ply sheet and flashing sheet, approximately 8 inches x 10 inches.
- E. 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 to all federal, state and local building codes including United States Code, Section 41:10, Subsections a-d, popularly known as the "Buy American Act".

1.03 QUALITY ASSURANCE

- A. 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 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.
- B. Contractor shall have ten (10) years documented experience in the application of similar waterproof systems. Lack of proficiency as shown by past work under other contracts which, in the sole judgment of the Owner, might hinder or prevent the prompt completion of additional work, if so awarded, or involvement in any legal actions which relate to past or present performances shall be sufficient cause to reject any bid offer.

1.04 DELIVERY, STORAGE AND HANDLING

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

1.05 PROJECT CONDITIONS

- A. Follow local, state and federal regulations, safety standards and codes. When a conflict exists use the stricter requirements.
- B. Do not apply waterproofing materials when water in any form (i.e. rain, dew, ice, frost, snow, etc...) is present on the deck.
- C. Ensure deck is structurally sound to support the live and dead load requirements of the waterproof system and sufficiently rigid to support construction traffic.
- D. Application can be made to 0°F, however workmanship standards tend to diminish below freezing temperatures and require extra supervision.

1.06 CODE COMPLIANCE

It shall be the Contractor's responsibility to ensure that the work on this project shall be in compliance with applicable safety code requirements, including obtaining any required permits prior to the start of the Work.

1.07 WARRANTY

Prior to project close out, the Contractor shall submit the Manufacturer's pre-approved 20 Year Labor and Material Warranty including membrane flashings and insulation. Pedestals and pavers shall be warranted for a ten year period.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

The Barrett Company is set forth as the referenced standard of quality. Other manufacturers of equal or better quality may request approval in conformance with specification requirements. Architect approved equals remain subject to all specification requirements.

2.02 WATERPROOFING MATERIALS

A. Waterproofing Membrane System:

Project Specification minimum standard of quality as set forth in Barrett Company Black Pearl BP•PMR specification or approved equal as noted above, in strict compliance with the following minimum specifications.

Materials required per 100 sq. ft. of roof area:

Black Pearl Waterproofing Membrane (BP•WM)	2 plies
Black Pearl Primer and Adhesive (BP•PA)	5 gals. (approx.)
Protection Course	1 ply

1. Black Pearl Reinforcing Membrane shall comply with requirements set forth in ASTM D-6769 in addition to the following minimum specifications. The Reinforcement Fabric shall be polyester fortified with fiberglass set in the machine direction.

<u>TEST</u>	<u>METHOD</u>	<u>TYPICAL TEST RESULTS</u>
Reinforcement Basis Weight	ASTM D-3776	140 gm/m ²
Sheet Thickness	ASTM D-1777	50 mils
Tensile Strength, lbf	ASTM D-4830	75 lbf/in.
Elongation, %	ASTM D-4830	26 MD, 28 XD
Tear Strength, lbf	ASTM D-4830	30 MD, 27 XD
Fatigue Life	ASTM D-8B	>10,000 cycles

2. Elastomeric Primer-Adhesive: Black Pearl Primer•Adhesive (BP•PA) shall comply with the requirements set forth in ASTM D-6769 and the following minimum specifications:

<u>TEST</u>	<u>METHOD</u>	<u>TYPICAL TEST RESULT</u>
Softening Point of bitumen Component	ASTM D-36	160°F
Solids content	ASTM D-3236	55% min.
Penetration (dmm)	ASTM D-5	30 dmm
Elongation @ 77°F min	ASTM D-412	100%
Tensile & adhesive	ASTM D-1004 DIE C	>1,000 psi avg.
Ductility 77°F	ASTM D-113	40 cm
Low Temp Flexibility	ASTM D-3111	-10°F min.
Solubility	ASTM D-2024	99% min.

3. Insulation: Plaza insulation board shall be a dense, rigid, extruded polystyrene insulation, ___ inches thick, designed for plaza applications, Dow “Plazamate”, Foamular or approved equal, and approved by the membrane Manufacturer for system warranty. Plaza insulation shall meet the following values:

<u>TEST</u>	<u>TYPICAL METHOD</u>	<u>TEST RESULTS</u>
Thermal Conductivity @ 75°F	ASTM C-518	0.20 K
Compressive Strength, min.	ASTM D-1621	60 PSI
Flexural Strength, min.	ASTM C-203	75 lb/in.
Water Absorption	ASTM C-272	0.1%
Water Vapor Permeance	ASTM E-96	0.3-.8 perm
Dimensional Stability	ASTM D-2126	2% max

4. Paver Units: Exposed aggregate precast concrete units, lightly sandblasted in production, in standard colors as selected by the Architect. Paver unit size shall be 2 inches thick, 24 inches x 24 inches square. Paver unit Manufacturer shall be approved by the membrane Manufacturer for total system warranty. Paver units shall comply with the following minimum specifications:

<u>TEST</u>	<u>METHOD</u>	<u>TYPICAL TEST RESULTS</u>
Compressive Strength	ASTM C-140	7000 psi, min.
Water Absorption	ASTM C-140	5% max
Freeze/Thaw Resistance	ASTM C-67:8	1% loss, max
Flexural Strength	ASTM C-293	600 PSI

5. Paver Pedestal Units and Leveling Plates: Barrett "Roofscape" Pedestal Units fabricated from high density polyethylene with integral 1/8 inch joint spacer ribs. Pedestal units shall have thorough drainage. Pedestal units shall meet the following values:

<u>TEST</u>	<u>TYPICAL METHOD</u>	<u>TEST RESULTS</u>
Low Temperature Brittleness	ASTM D-746	-90°F
Shore Hardness	ASTM D-1706D	65
Softening point	ASTM D-15252	164°F

B. Related Materials:

1. Flashing Sheet: **RAM** 306 granular surface SBS sheet shall comply with ASTM D-6164, Grade G, Type I, minimum specifications.
2. Primer: **RAM** Primer/Surface Conditioner shall comply with ASTM D-41 requirements and only used when directed by manufacturer.
3. Protection Course: RAM 203 SBS polymer-modified Protection Course or approved equal.
4. Pipe and Stack Flashings shall be 16 oz./SF copper or .015 thick stainless steel installed in accordance with standard SMACNA and NRCA details.

5. Drain Mat: **RAM** Drain Mat 1241 shall have a 0.5 inch low profile with geotextile surface on both sides. [Optional]
6. Flashing Mastic: **RAM** Mastic trowel grade SBS modified cold process cement.
7. Nails and Mechanical Fasteners: As specified by the fastener Manufacturer for specific application and approved by membrane Manufacturer.
8. Filter Fabric: PolyFelt 3.5 Filter Fabric or approved equal.
9. Sheet Metal - See Section 076000.

PART 3 - EXECUTION

3.01 PREPARATION

Optional:

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

- A. Condition of Surface: New concrete surfaces shall comply with ACI 301-11.7.3 wood float finish. All deck surfaces shall comply with ASTM D-5295 standard preparation guide and cured for a minimum of 48 hrs. with no visible surface water.

Existing concrete decks shall be examined for any defects or failure to meet ASTM D-5295 standard. All surfaces shall be free from laitance, grease, oil, unapproved curing compounds or other foreign matter detrimental to performance of the waterproofing membrane. The General Contractor shall certify no wax base or stearate based 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 addressed and corrected. Voids, cracks, holes and other damaged surfaces shall be repaired with materials compatible with **Black Pearl** such as Sika epoxy concrete or approved equal.

- B. Expansion Joints: Expansion joints shall be sharply formed and free of broken edges, 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. Chamfer edges of the curbs.

3.02 APPLICATION

A. Waterproofing Membrane:

1. Installation of Black Pearl Membrane is required at all flashing conditions including curbs, changes of plane, all joints and cracks and all penetrations such as pipes, rebar and conduits before proceeding with the field waterproofing. All flashings are installed in a 2 layer redundant configuration prior to the horizontal field of the deck membrane being installed.
2. Start detailing installation with a full coating of BP Primer Adhesive applied at the standard rate of 1.5 to 2 gallons per 100 square feet at flashing conditions and allow to dry to tacky condition. Install the first ply of BP Membrane a minimum of 6 inches beyond the corner or penetration in each direction. Each succeeding ply shall extend at least 4 inches beyond the underlying ply one side and shall be adhered to the previous reinforcement layer with additional adhesive applied at the same rate. At vertical pipe penetrations the flat section is installed first, followed by the vertical “wrap” where the “fingers” shall extend a minimum of 2 inches out onto the horizontal deck.
3. All drains shall be flashed with BP Membrane, 39 inches square and set in BP Primer-Adhesive before the new 2 layer-5 course waterproofing is installed over the field of the deck. All drains require clamping rings.
4. Follow the standard details of ASTM D-5898 unless otherwise required by the manufacturer or designer. All laps are to be inspected and completely sealed with BP Primer-Adhesive and all flashing reinforcement shall be rubbed or rolled into place with a steel hand roller or a weighted roller.
5. For expansion joints up to 3 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 creating a “hammock”. The “hammock” shall be looped into the joint 1-1/2 times the joint width at maximum opening and extend 4 inches onto the deck on each side of the joint. Embed the horizontal flashings into a thick coating of Black Pearl-PA. Install customized Black Pearl foam joint in a width ¼ inch smaller than the opening and the bridge centered as shown. Install a sheet of Black Pearl-WM looped over the foam extending 12 inches onto the deck on each side of the joint and set in Black Pearl-WM. Overcoat the flange on each side.
6. Deck Equipment and Penetrations: Any mechanical units set on the deck shall be lifted to allow new waterproofing and flashing under unit as required. Minimum height for all curbs is 8 inches above the highest expected waterline. Raise as shown or required. New equipment dunnage, flashing and metal coping shall be installed as shown or required. Install new neoprene wearpads between the unit supports and dunnage.

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7. Start the Black Pearl Primer-Adhesive application over the field of the deck after completing all detail work for contiguous work area. Begin installation of BP Waterproofing Membrane at the low points and drains unless otherwise approved by the manufacturer.
8. Apply Black Pearl Primer-Adhesive (BP-PA) at a rate of 1.5 to 2 gals. per 100 square feet and allow to dry to a tacky condition before installing the first layer of Black Pearl Membrane (BPM). Apply only as much adhesive as can be covered with membrane before the adhesive loses its tack.
9. Lap all edge seams a minimum of 4 inches and stagger all end laps a minimum of 6 inches. Continue the membrane 4 inches up any vertical surfaces already flashed with the flashing assembly.
10. Install membrane and rub the membrane into place with stiff brooms or a squeegee. Total contact with all substrates is required. No “bridging” will be acceptable.
11. Install second layer of BP Membrane in a BP-PA coating applied at the rate of 1 to 1.5 gal. per 100 square feet, after allowing the BP-PA to reach a tacky state. Broom or squeegee in place. Offset the side laps from the first ply by half a sheet width and end laps by 6 inches.
12. If a flood test or electric field vector mapping survey is to be conducted, it shall occur at this time.

B. Protection Course:

After quality control tests and the Manufacturer has approved the membrane installation, install specified protection course in top coat of BP Primer-Adhesive installed at 1 to 1.5 gal. per 100 square feet. Provide 3 inch side lap overlaps in each direction of drainage gradient.

C. Insulation:

Insure that membrane, flashing and other associated work is completed, tested and approved by Manufacturer. Upon acceptance of the waterproofing application, install extruded polystyrene insulation directly on the protection course. Stagger end joints. Tightly abut all boards. The maximum acceptable opening between boards is 1/4 inch. Install filter fabric over the insulation and turn up 6 inches at all projections and obstructions. Fabric can be trimmed after installation of the pavers. Provide temporary ballast required to prevent wind damage.

D. Drainage Mat: **[Optional]**

Clean surface of any loose debris. Install RAM Drain material with heavier, black mat down. Start panels so that the edge with the fabric lap is facing the perimeter condition. Seal the lap to the perimeter. Cut panels to fit tightly around the penetrations. Place adjacent panels so that the cores are butted-together. Lay the 4 inch fabric lap onto the adjacent panel. Secure the flaps at 3 inch intervals with adhesive or duct tape. Join roll ends by peeling back the fabric and cutting off 4 inches of the core. Place panel ends so that the cores are butted together. Glue or tape overlap in place at 3 inch intervals.

E. Pavers and Pedestals:

Specified paver units shall be set on specified pedestals to line and grade as shown, with uniform joint width. Adjust pedestal elements so that precast paver has bearing on all four corners. Where cutting is required it shall be done with a high speed masonry saw producing clean sharp edges. Precast paver units shall fit to within 1/4 inch of all projections and walls or as shown on drawings. Provide shims as required to align paver surface with existing elements and other pavers.

Following pre-determined layout, locate first row of paver units at the longest exterior edge of deck. Use 1/2 unit pedestals at the edgeline and 1/4 unit pedestals at corners. Place paver stones by lowering horizontally rather than nosing into position to eliminate possible indentation of the substrate. Run subsequent rows of pavers parallel to first row. Finished installation shall be set to line and grade shown with uniform joint width. Replace any units that exhibit damage to surface finish, corners or edges which will be exposed to view in the finished work. General Contractor shall protect units in place from soiling or damage. Install 0.18 thick stainless steel banding 3 inches wide centered over each of the outer two perimeter rows of pavers and elsewhere as required and approved by the insulation manufacturer.

3.03 FIELD QUALITY CONTROL

A. Material usage and adhesion tests shall be monitored by the Applicator every hour throughout the application process.

B. Core Cuts:

Test cuts shall be taken as directed by a representative of the Architect at their discretion. Test cuts should be 3 inches by 48 inches and run perpendicular to the direction of the reinforcement to provide a representative sample of the waterproofing work. Test cuts generally will not exceed 1 per 100 squares of deck area.

1. Follow field audit criteria outlined by ASTM Standard D 3617-83.

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2. Send roof cuts to: Structural Research Inc., Madison, Wisconsin, or Manufacturer approved, equally accredited laboratory, for laboratory examinations. Contractor shall allow \$500.00 for testing fees per 100 squares of deck area. Laboratory reports shall be submitted by the laboratory directly to the Architect.
 3. Repair sampled areas by filling in the cut-out area then use a "feathered in" patch consisting of same number of plies as in the waterproof specification following the Manufacturer's and NRCA procedures.
- C. Correct deficiencies in membrane, if any, (determined by core cut analysis) as prescribed by material Manufacturers and approved by the Architect.

3.04 CLEANING

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

3.05 PROTECTION

General Contractor and the Owner shall protect finished waterproofed areas from damage during subsequent construction not related to the deck areas.

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
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