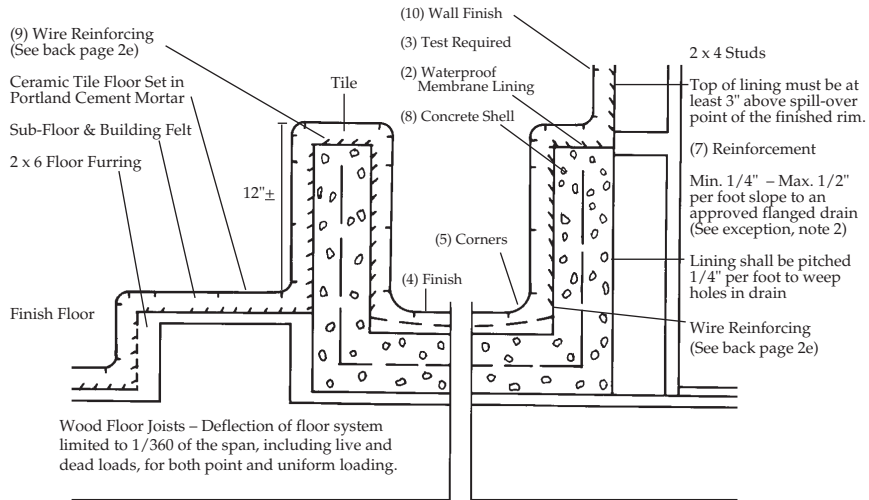


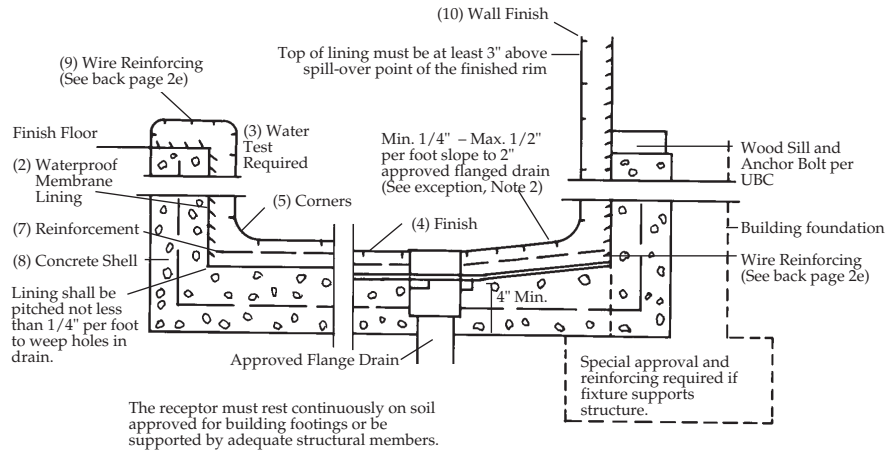
**Installation Standard
For
TILE-LINED ROMAN BATH TUBS**

IAPMO IS 2-2003



A vapor barrier consisting of at least one layer of 15 lb. type asphalt saturated felt shall be between wood surfaces and concrete.

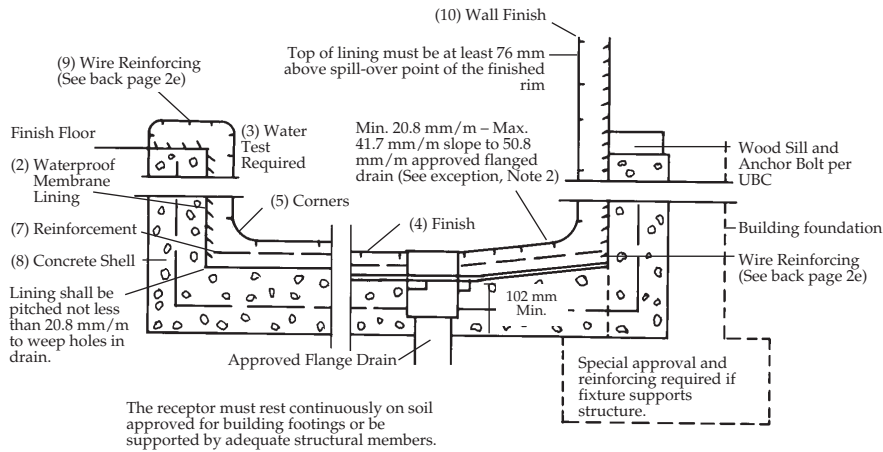
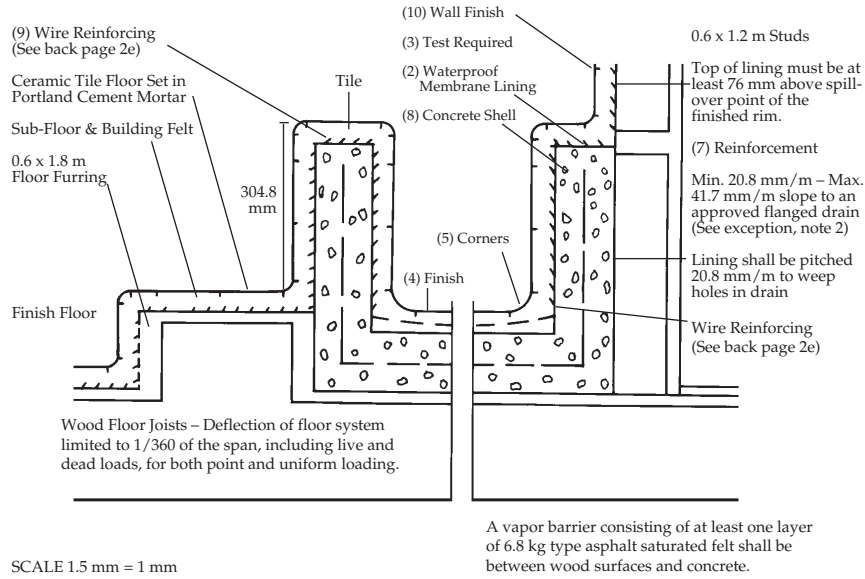
SCALE 1-1/2" = 1' - 0"



SCALE 1-1/2" = 1' - 0"

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METRIC



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1.0 GENERAL REQUIREMENTS

1.1 Inspection of Work – All surfaces prepared by others shall be inspected by the tile installer before starting tile work and all unsatisfactory conditions reported to the Administrative Authority. Starting tile work by the tile installer shall be considered as acceptance of surfaces prepared by others.

1.2 Surfaces – All surfaces to receive tile work shall be clean, structurally sound, and conform in every way to the local Building Code.

(Note: No tile work shall proceed until the pan and drain construction has been inspected and approved by the Administrative Authority, where required.)

2.0 MATERIALS

2.1 Tile Quality and Grade – Tile shall comply with American National Standard Specification for Ceramic Tile, A137.1 (equivalent to and incorporating U.S. Dept. of Commerce Simplified Practice Recommendation, R61-61 and Federal Specification SS-T-308b, Tile, Floor, Wall, and Trim Units, Ceramic).

2.2 Cement – Cement shall be portland cement type I or type II, conforming to ASTM C 150.

2.3 Sand – Sand shall be damp, clean and graded ASTM C 778.

2.4 Water – Water shall be potable.

2.5 Reinforcing shall be 3 inch x 3 inch (76 mm x 76 mm), 13 x 13 gage or 1-1/2 x 2 (38 mm x 51 mm) mesh, 16 x 13 gage steel wire, conforming to ASTM A82 and A185.

2.6 Asphalt shall conform to Federal Specification SS-A-0666, Type Z, Grade 2, Class A.

2.7 Plastic Roof Cement shall conform to Federal Specification SS-C153.

2.8 Waterproof Felt Membrane – The waterproof felt membrane shall be at least 15 lb. (6.8 kg) asphalt saturated felt, conforming to Type I, Federal Specification HH-F-191 (a).

2.9 Plastic Membrane shall comply with applicable standards listed in Table 14-1 of the UPC.

2.10 Other Membranes – Where the Administrative Authority approves their use, non-metallic sub-pans or linings of lead sheets weighing not less than 4 lbs. per sq. foot (191.5 Pa) and copper pans of at least No. 24 B & S gage may be used.

2.11 Waterproofing Admixture – The mortar bed of the receptor shall be mixed with a waterproof admixture, approved by the Administrative Authority in the amounts allowed by such approval.

2.11.1 Currently Approved Mortar Additives

Anti-Hydro – 1 qt. (0.95 I) per sack of cement.

Plastiment – 1 lb. (0.5 kg) of powder per sack of cement.

Plastiment – 2 oz. (56.7 g) of fluid per sack of cement.

Sika 3A – 1 qt. (0.95 I) per sack of cement

Suconem (Red Label) – 1 pint (0.47 I) per sack of cement.

3.0 INSTALLATION

3.1 Drains – An approved type drain with sub-drain shall be installed with every such shower membrane. Flange of each sub-drain shall be accurately set exactly level with sloping sub-floor and shall be equipped with a clamping ring or other approved device to make a tight connection between the membrane and the sub-drain. The sub-drain shall have weep holes into the waste line. The drain shall be of such design that there will be not less than 2 inch (51 mm) depth from the top of the sub-drain flange to top of the strainer. A ring of absorbent material must be placed around the weep holes to keep them open when the finish materials are installed.

3.2 Sloping Sub-Floor and Membrane – All lining materials shall be pitched not less than one quarter (1/4) inch per foot (20.8 mm/m) to weep holes in the sub-drain by means of a smooth and solidly formed sloping sub-base. All such lining materials shall extend upward on the side walls of the tub to a point not less than four (4) inches (102 mm) above the top of the finished dam or threshold and shall extend outward over the top of the rough threshold and be turned over and fastened on the outside face of the rough threshold. All ledge tops within four (4) inches (102 mm) above the rough threshold shall be covered with the lining material. Non-metallic sub-pans or linings shall be built-up on the job site and shall consist of not less than three (3) layers of standard grade fifteen (15) pound (6.8 kg) asphalt impregnated roofing felt. The bottom layer shall be mopped to the formed sub-base with hot asphalt and each

succeeding layer thoroughly hot-mopped to that below, on the basis of twenty (20) pounds (9.1 kg) of asphalt per layer per square. All corners shall be carefully fitted and shall be made strong and watertight by folding or lapping, and each corner shall be reinforced with suitable woven glass fiber webbing hot-mopped in place. All folds, laps, and reinforcing webbing shall extend at least four (4) inches (102 mm) in all directions from the corner and all glass fiber webbing shall be of approved type and mesh, producing a tear strength of not less than fifty (50) pounds per square inch (344.5 kPa) in either direction. Non-metallic shower sub-pans or linings may also consist of multi-layers of other approved equivalent materials suitably reinforced with glass fibers and having each layer carefully fitted and hot mopped in place on the job site as elsewhere required in this section, according to manufacturer's recommended installation procedures.

Linings shall not be nailed or perforated at any point which will be less than one (1) inch (25.4 mm) above the finished dam or threshold.

Where flexible plastic sheet membranes are used, corners shall be carefully constructed by folding or bonding of pre-fabricated reinforcing corner. Joints in flexible plastic sheeting shall be constructed with the appropriate solvent bonding liquid, bodied solvent cement, or thermal welding.

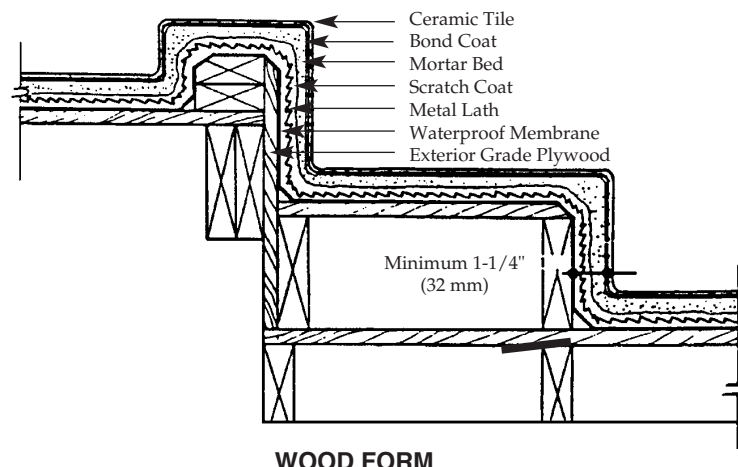
Where lead and copper pans are used as membranes, the installation shall be made in similar manner as required for felt membranes, except the asphalt moppings, and, in addition, the pans shall be insulated

from all concrete and mortar surfaces and from all conducting substances, other than their connecting drain, by 15 lb. (6.8 kg) asphalt saturated felt or an approved equivalent, hot-mopped to the lead or copper pans. Joints in lead and copper pans shall not be soldered, but shall be burned or silver brazed, respectively.

3.3 Tests – Upon installation, all concrete tub shells shall be tested for water tightness by being filled to the top of the rough threshold with water for 24-hours to establish their water tightness.

3.4 Roman Bath Tub – Floor shall be of ceramic tile set in portland cement mortar, mixed in the proportion of one (1) part portland cement to four (4) parts of mortar sand by volume and shall be provided with an approved shower drain designed to make a water-tight joint at the floor. The mortar mixture shall be of such consistency that a troweled surface readily assumes a smooth, slickened surface. All concrete mortar bases shall be mixed with an approved waterproofing admixture and properly reinforced with 3 inch x 3 inch (76 mm x 76 mm) mesh, 13 x 13 gage or 1-1/2 inch x 2 inch (38 mm x 51 mm) mesh, 16 x 13 gage cold drawn welded steel wire fabric located in the approximate center of the mortar bed and extending up the side walls but, in no case, less than 1 inch (25.4 mm) above the finished threshold. Corners shall be lapped and the reinforcing shall extend over the threshold and ledges.

The total thickness of the floor mortar shall not be less than 1-1/4 inch (32 mm) at any point. The tile floor shall have a minimum of 1/8 inch (3.2 mm/m) pitch and a



maximum of 1/2 inch (12.7 mm/m) pitch toward the drain per foot. Bath tub walls to a minimum height to 3 inch (76 mm) and not less than 1 inch (25.4 mm) above the finished dam shall be lined with ceramic tile set in portland cement mortar, mixed with an approved waterproofing admixture.

All wood framed bases shall be designed with a maximum deflection of 1/240 of the span, including live and dead loads.

- 3.4.1** Note: Two stages of construction are covered – the reinforced concrete shell and the wire reinforced tile lining over the water-proof membrane.
- 3.4.2** Approved waterproofing membrane, mortar bed and finish construction shall conform to the general requirements of the Uniform Plumbing Code. Exception: In short sections where there is no foot traffic, the finished floor may exceed 1/2 inch per foot (12.7 mm/m) slope.
- 3.4.3** Each concrete shell shall be filled to its overflow rim with water and shall remain watertight for not less than twenty-four (24) hours before inspection and before the finish surface is installed.
- 3.4.4** The finish surface shall be ceramic tile installed with portland cement mortar mixed to a proper consistency in the proportion of one (1) part cement and four (4) parts mortar sand by volume and having an approved waterproofing admixture* included. Ceramic tile joints shall be thoroughly grouted with approved waterproofing grout containing an admixture.
- 3.4.5** The concave interior surfaces shall be such as to permit ready cleansing and all corners shall be rounded or at angles not in excess of 45°. Grout is not acceptable for rounding corners. See details below on approved corners.
- 3.4.6** Concealed overflow or built-in waste stopper may be used if designed and approved for this application.
- 3.4.7** For reinforcement in center of pour, use #30 @ 8 inch (203 mm) O.C. both ways.
- 3.4.8** 2000 P.S.I. (13,780 kPa) compressive strength concrete shall be poured monolithically and shall have an approved waterproofing admixture included*. Concrete to have not less than six (6) sacks of portland cement per batch.
- 3.4.9** Reinforcing wire, as specified under materials in this standard or equal, shall be wired together in a self-supporting manner. Nails shall not be used through the waterproofing membrane to fasten wire reinforcing.

*Quantities of several approved waterproofing admixtures required per sack of cement:

Anti-Hydro – 1 qt. (0.95 l) per sack of cement.

Plastiment – 1 lb. (0.5 kg) of powder per sack of cement.

Plastiment – 2 oz. (56.7 g) of fluid per sack of cement.

Sika 3A – 1 qt. (0.95 l) per sack of cement.

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ADOPTED: 1966

REVISED: 1977, 1982, 1990, 2003

