SECTION 113- PREFABRICATED BITUMINOUS SURFACE

2524. General. Prefabricated mats, some of which are intended mainly for use in air field and airstrip construction, may also be used as expedients in road construction. Mats increase the load-bearing capabilities of a soil by spreading the load imposed on it and protecting the soil from abrasion. Providing it is firmly embedded on a properly levelled and well-drained surface, a prefabricated mat may be taken as having a bearing strength equivalent to 150 mm of road base construction. The following matting is currently available:

a. Pierced Steel Plank (PSP) (Obsolescent).
b. Prefabricated Surfacing, Aluminium (PSA).
c. AM-2 Matting.
d. Logistic Track way (Mammoth Matting).
e. Prefabricated bituminous surface.

2525. **Pierced Steel Plank (PSP)**. When used to provide a carriageway, PSPplanks are connected together with interlocking bayonet joints that are locked with spring clips. If necessary, more than one layer of PSP may beused. When two layers are needed, the lower one should be laid longitudinally to the direction of traffic and the upper one transversely to it. Edges must be well anchored, otherwise planks might curl up at the end sand lose their bearing strength and individual planks may prove very difficult to remove for repair or replacement. PSP is obsolescent but small quantities are still available.

Figure 25.10: PSP laying on the Ground

2526. **Prefabricated Surfacing, Aluminum (PSA)**. PSA is used for Harrierpads and taxiways: it is special-to-role equipment that is not normally issued for other tasks. PSA panels have a male and a female edge thats lot together and mats are anchored with special pickets. The panels aregrey-green in colour with a roughened upper surface to increase resistance to skidding. There are special panels, colour-coded, to cater for ends ofrows, anchoring, tie-down and repair. The basic panel is 2.74 m in length and has an effective width of 0.25 m and a weight of 10.6 kg. A PSA pallet contains 200 plain panels and weighs 2400 kg.

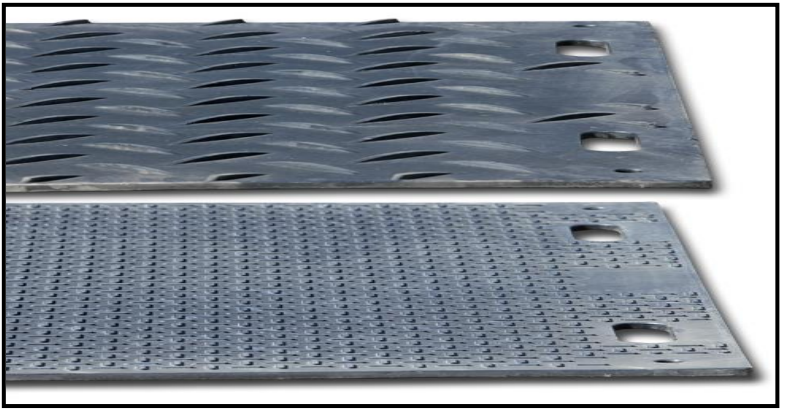


Figure 25-11: Prefabricated Surfacing, Aluminum (PSA).

2527. **AM-2 Matting**. AM-2 matting is an American expedient surfacing that isnormally used for the construction of expeditionary airfields, helicopterpads and VTOL pads. Most AM-2 components are of extruded aluminiumand when laid the panels interlock with each other at their sides and endsto form an area of rigid matting. AM-2 equates to 280 mm of flexible construction and can be laid on a natural surface with a minimum CBR of 4%. AM-2 panels are the principal structural component of the mat: theyare hollow, webbed, aluminium extrusions with a surface coat of non-slipmaterial. The panel is 3.66 m long, 0.61 m wide, 38 mm thick and weighs63.3 kg.

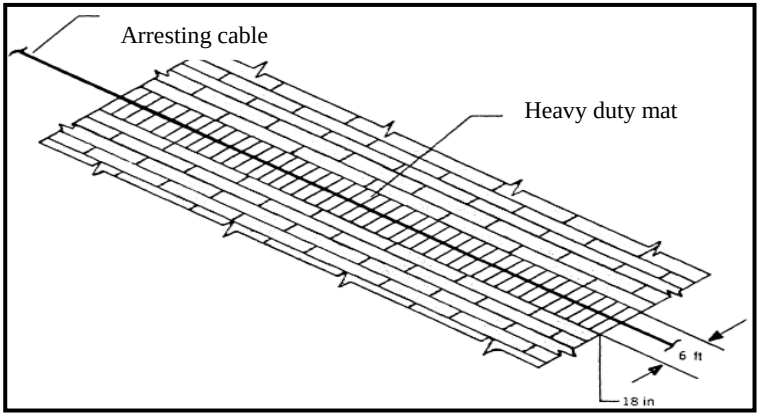


Figure 25-12: AM-2 Matting

2528. **Logistic Trackway (Mammoth Matting)**. Logistic Track way is common lyknown as 'Mammoth Matting'. The mat is a carpet of woven poly propyle negeotextile with steel wire ropes interwoven along its length and high tensile steel bars woven across its width (*see* Figure 8/8). It is supplied in 4 m x30 m rolls, complete with an accessories pack. Mats can be laid end-to end with an overlap of at least three transverse bars, or side-by-side with an overlap of 500 mm, to form roadways or hard standings. Logistic Track way is not intended to be used on main supply routes, which take a high volume of traffic and heavy load class of

vehicle, but is suitable for temporary expedient repairs of short duration. The mat must not be usedwhere rutting exceeds 150 mm or hogging exceeds 110 mm, otherwisepermanent deformation of the steel bars may occur. On weak sub-soils, itmay be advantageous to lay a light geotextile under the mat to preventsub-soil penetration of the mat. The mats are laid and recovered byunrolling and rolling by hand. They must be cleaned by high-pressurewater prior to rolling for storage. Logistic Trackway is capable of use bywheeled vehicles up to MLC 35 on ground of CBR 6 and above: it must notbe trafficked by tracked vehicles.

2529. **Usage**. The expedients described in this section absorb large quantities ofstores and, in most cases, they are expensive in time for construction andmaintenance. They should be used only for short lengths of track when noother means are available

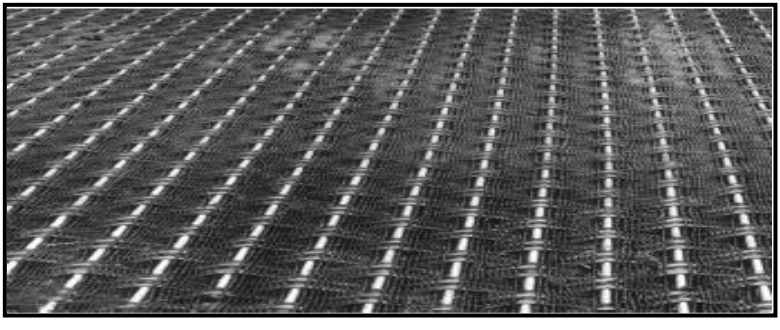


Figure 25-13: Logistic track way (Mammoth Mat).

2530. Prefabricated Bituminous Surfacing. PBS forms a waterproof skin. It does not add to the bearing strength of the base or subgrade. It is not suitable for tracked vehicles nor for animals and for wheeled traffic it is only a temporary expedient as the fabric is quickly destroyed by high speeds, fast turning and hard baking.

2531. Stores and laying constants are given in table 25.6.

TABLE 25.6: PBS GENERAL DATA

Dimensions	Unit weight (lb)	Gross weight par 100 yds x 10 ft	No of rolls per 3 ton truck	Speed of laying only (1 NCO and 10 men per strip)	Remarks
(a)	(b)	(c)	(d)	(e)	(f)

17 in roll 240' x 3 ' 4 "	320	1 ton (approx.)	20	200 sqft per man hr	Overlap- Adjacent strips- End joints- 3 ft solvent- 1 gal per 20 sqyds
20 in roll 300 x 34 "	380				

2532. Site preparation:

a. Ensure that the formation is strong enough to carry anticipated traffic loads.

b. Provide side drains of ample size. They must be deep enough to prevent subsoil water accumulating in the subgrade.

c. Grade to a smooth surface of correct shape and compact thoroughly.

d. Dig out soft patches replace with sound material and compact.

e. Remove or thoroughly roll in stones exceeding ¼ in to avoid punctures.

2533. Laying and jointing. Lay strips lengthwise with the side marked with a coloured line uppermost to ensure accurate over lapping (see Figure25.14) Loose dusting powder must be broomed off before jointing.

Hand laying is normally used in road work, adhesion being secured by folding back half the strip end to end, applying solvent with mops or brooms, or by spraying and then laying the wetted surface on the soil or over lapping a previously laid strip. The process is repeated for the other half of the roll.

Alternatively, solvent can be applied by a stationary PBS laying machine ("stamplicker"). In this case, a complete roll is treated and is then carried by hand, as a strip and laid in position.

Machine laying, normally used in airfield work, is dealt with in RESPB No 5b.

2534. Solvent. A mixture of gasoline and diesel oil is used. Proportions vary with climatic conditions, from 50 per cent of each to 70 per cent gasoline and 30 per cent diesel oil. About 1 gallon per 20 sq yes is required. Partial evaporation is needed for good adhesion: traffic should be kept off for 12 hours if possible.

2535. Torch method. Immediate adhesion is secured by liquefying the bitumen coating on the hessian, instead of using solvent, by means of

torches burning gasoline, diesel oil. Or kerosene (see Figure25.15). This method is slow and consumption is about 1 gallon per 60 sq yds.

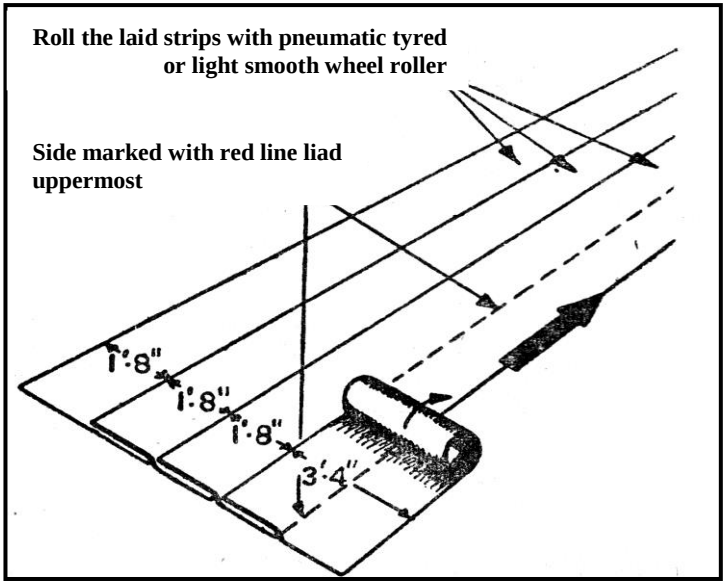


Figure 25-14: PBS Method of Laying and Jointing Overlap

2536. Precautions and Limitations.

a. PBS rolls should be stacked on end not more than three rolls high.

b. Strict fire precautions must be enforced while solvent is being applied. No smoking or matcher should be allowed within 50 yds.

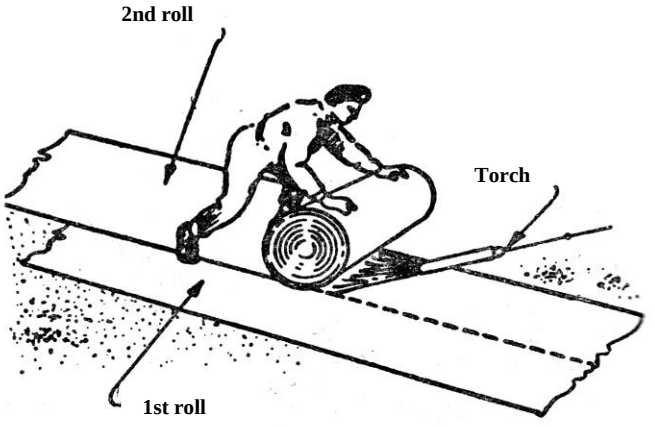
c. Except for hasty work strips should be allowed to lie flat before jointing, preferably for 24 hours to eliminate roll distortion and wrinkles.

d. Daily inspection is essential. Soft spots, cuts and tears must be made good immediately (see Figure 25.16)

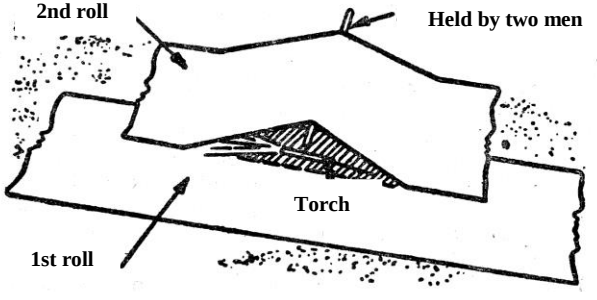
e. Material is apt to tear if roughly handled and in very difficult to lay in strong winds.

f. Fuel spillage may dissolve the bitumen coating.

g. Laying is impeded by moisture and in temperature above 100 F or below about 50 F.



(a) Apply torch over a width of about 9 ins at junction as top layer is unrolled slowly following the flame



(b) After unrolling top layer two men hold it up on bar to form a tent. The torch is applied nearly parallel to the edge of the strip

Figure 25-15: PBS-Torch Method of Joining

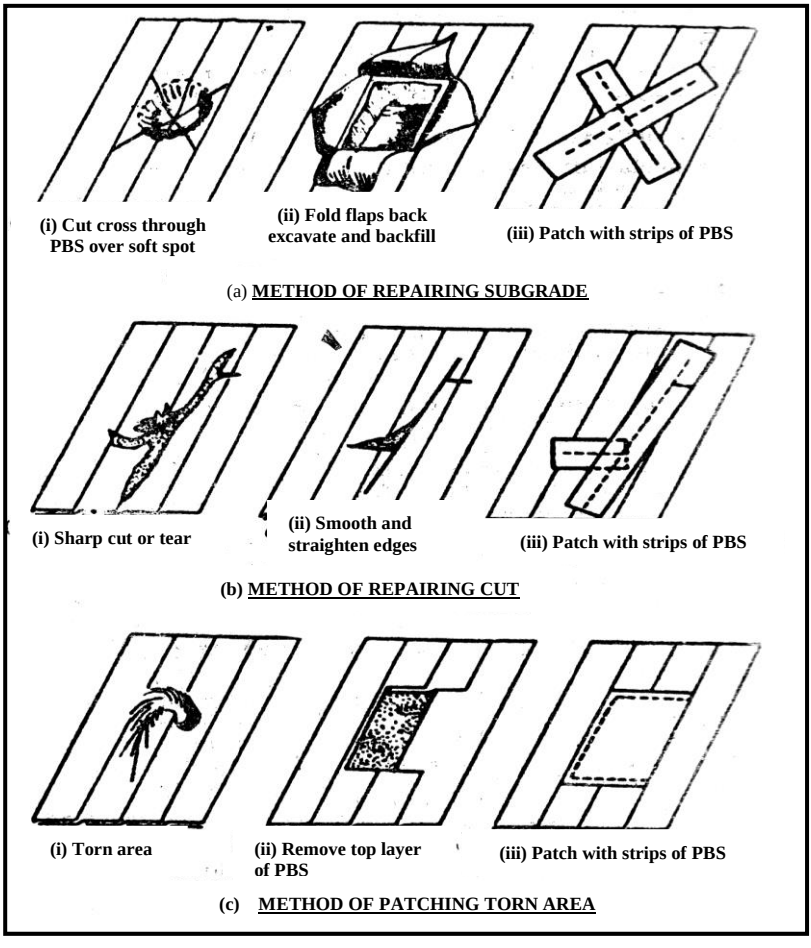


Figure 25-16: Methods of Patching Torn Area

2537. PBS in combination with metal surfacing. Metal surfacing can be used on tob of PBS but may itself puncture the fabric.

To safeguard the PBS when using metal mesh such as SMT “cushion” of hessian or straw, about ¾ in thick, can be laid between PBS and metal.

Old style PSP will puncture PBS under traffic loads: more recent types cause less damage. Damage can be minimized by placing a 2 in layer of Sand under the PBS.