SECTION 127 – REPAIR OF CRATERS

2722. If subgrade material is displaced or loosened, or If daring is disrupted, the restoration of subgrade set ability is vitally important.

2723. Shell holes and small bomb craters (see Figure27.3):-

a. Remove all mud and water.

b. Cut the whole square, down to dry, firm material.

c. Fill up to the level of the original formation with the best available material, placed and compacted in layers.

d. Lay a base and surfacing on top, well bonded into the undamaged original surfacing.

e. The hole is refilled to within 300 mm of the surrounding road surface with hard core filling in 150 mm layers (*see* Figure27.3b (i)) or, if that is not available, with 150 mm layers of well-rammed soil. Sandbags provide a useful means of carrying soil to craters. If sandbags are used, then alternate layers can be of 150 mm of well-rammed earth and properly laid and rammed sandbags (*see* Figure27.3b (ii)).

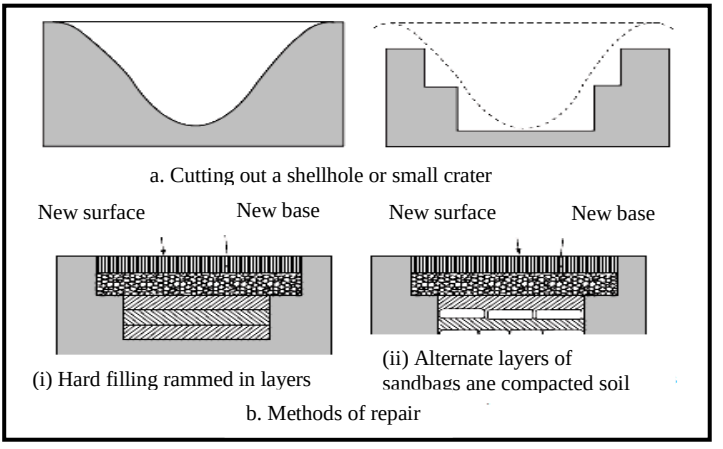


Figure 27-3: Repair of Shell Holes and Small Bomb Craters.

2724. Hasty repair of large craters. If the crater constitutes a road block and there is no practicable detour, it is the responsibility of the troops on the spot, using plant earmarked for thispurpose, to carry out hasty repairs to enable essential traffic

to pass. Theaim should be to clear a track not less than 3.5 m wide across the damagedarea. In fair weather, such a track can be made as follows (*see* Figure27.4):

a. The vicinity of the proposed track is searched for mines and booby trapsand the unsearched area is fenced off.

b. As much mud and water as possible is pumped out. If the presence ofwater is caused by a damaged drain, the drain is repaired first.

c. Loose debris and disturbed soil is cleared from the bottom and sides ofthe crater.

d. The bottom level is cut in sound material and a solid base is built of four150 mm layers of well-rammed soil or four layers of carefully laid sandbags.

e. The crater is filled to track width with the hardest material readily available, in layers about 150 mm thick, and well-rammed or compacted. Unless it is very silty or clayey, the soil thrown up round the crater may be used. If the soil is very wet, a layer of filled sandbags between each layer of rammed earth should strengthen the fill.

f. The lips of the crater on the line of the track are ramped down to a slope not steeper than 1 in 4 using the loosened material to build up the track within the crater.

g. The track within the crater is finished with a crown to allow for subsidence.

For very large craters, especially in wet conditions, the best and quickest method may be to bridge the gap with equipment bridging.

Where possible, tracks or bridges across craters should be sited so as to allow repair work to be done in the crater itself.

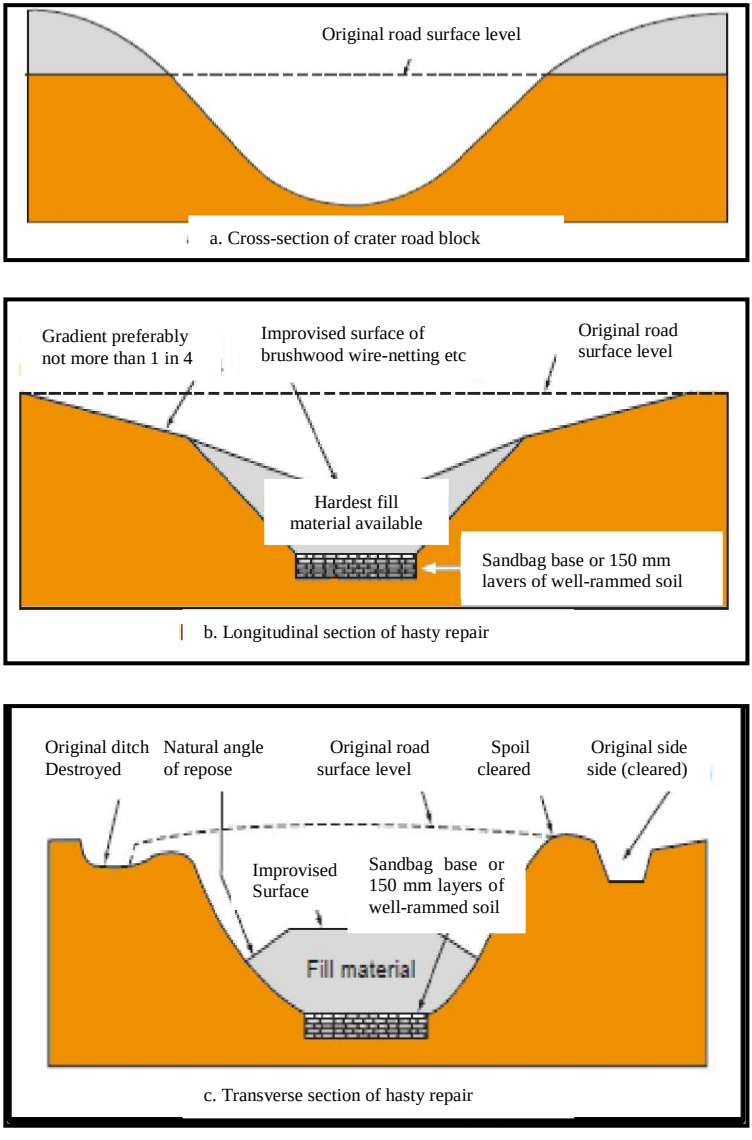


Figure 27-4:Hasty Repair of a Large Road Crater (Fair Weather Only)

2725. The hasty repair of a large crater in wet weather takes longer. The sequence may be:

a. The drainage system is repaired in order to prevent surface water flowing into the crater.

b. As much of the water and mud as possible is cleared from the crater.

c. The crater is filled with coarse hard material only, to the level of the surrounding surface.

d. The repair is finished off with two 150 mm layers of finer hard material, well-rammed and compacted.

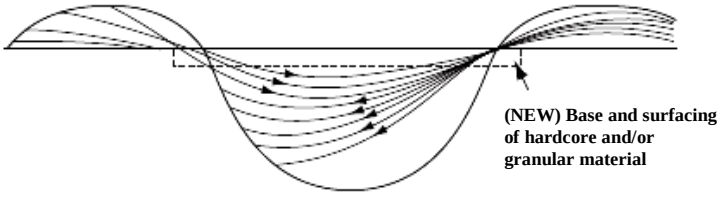
e. The final surface of the track ramps upwards from the undamaged surface.

2726. Deliberate repair of large craters:

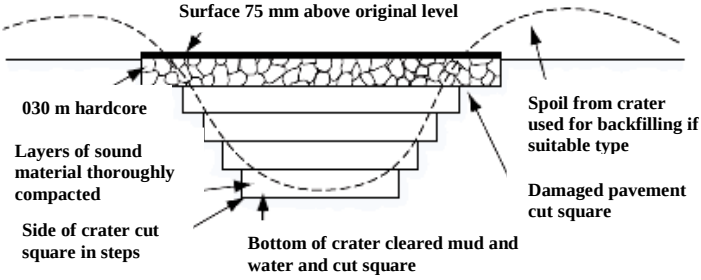
a. First remove all standing water. Plug and repair any broken drains. Remove all mud and wet soil. If water seeps into the hole, use only coarse filling material for repair. If the crater is dry, clear loose debris and disturbed soil from the bottom and sides of the crater.

b. Unless the spoil thrown up is very silty or clayey the best method is to back fill with a tracked dozer (see Figure 27.5 (a)). Work the soil into the hole from one side to form a ramp. As soon as the dozer can move in and out of the crater, push spoil in from all round and track compact it in layers about one feet thick.

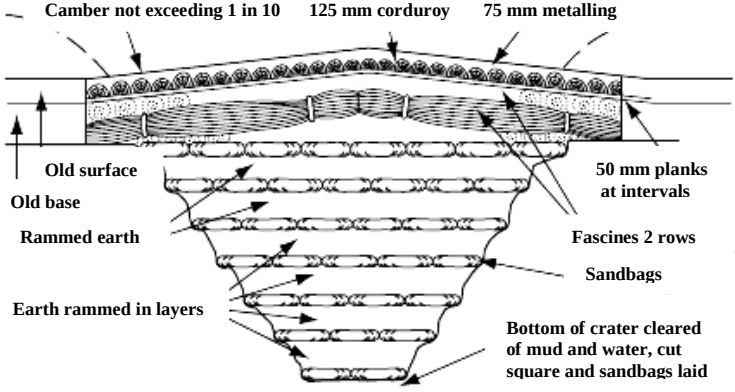
c. A slower but more reliable method is to cut the bottom level in sound material and to cut the sides in steps (see Figure 27.5 (b)). Fill the crater with sound material, compacting each 6 in to 1 ft layer either mechanically by crawler tractor or by hand ramming. Finish the fill to a slight crown to allow for settlement and provide surfacing. If the available filling material is of poor quality, alternate layers of filled sandbags and compacted soil canbe used, but maintenance will be necessary to make good settlement (see Figure 27.5 (c)).



a. Diagram showing method of back filling and track compaction (see Paragraph 0944)



b. Longitudinal section of deliberate repair with granular material and hardcore



c. Longitudinal section of deliberate repair of a large road crater using fascines timber sandbags and natural soil (eg on an earth road or where pave was laid over chalk and clay subgrade)

Figure 27-5: Method of Repairing Large Craters.