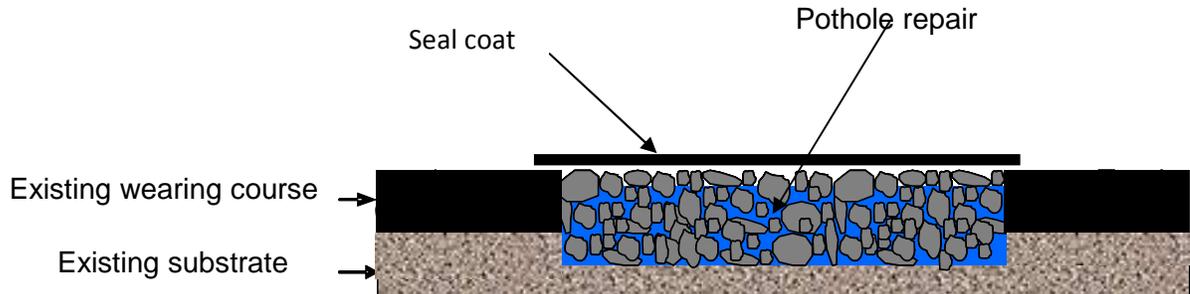


Method statement for labour based construction of:

Pothole repairs with hot or cold mix asphalt



Definition

A pothole is a round shaped hole in the road surfacing normally indicative of inadequate routine maintenance. As potholes constitute a hazard to traffic they should be repaired as soon as is practically possible. Initially, the extent of the pothole is generally limited to the depth of the surfacing. If left unattended, the pothole will normally extend into the basecourse layer. Care must be taken in this case to ensure the repair procedure will address the problem. If dealt with in time, the size of a pothole normally does not exceed 300 mm.

Potholes can occur due to poor material quality, a lack of adequate compaction and the presence of water in the base layer due to subsurface seepage or a pervious surfacing.

Application

Pothole repair is a typical road maintenance operation arising from localized defects or neglect of routine maintenance procedures. The repair should be carried out in such a manner so as not to cause the development of additional distress around the repair. All damaged material around the pothole should be removed and care should be taken to ensure that the intact surfacing around the pothole being fixed is not adversely affected by the compaction equipment used in the repair operation. This method statement covers the repair of potholes using either hot or cold mix asphalt. Both options have their advantages and disadvantages which will be discussed in the section on Quality Control.

Material requirements

Asphalt: - Hot or cold mix can be used. Usually a smaller maximum stone size (-9.5 mm) is used for ease of operation and compaction.

Prime or Bitumen emulsion: - Diluted anionic stablemix grade 60% bitumen emulsion is recommended as a tack for the pothole operation as it breaks faster and allows the work to be completed in one operation.

Solvent/water: - used to clean the equipment after use. Items used with an emulsion can be washed with water. Solvents will be required if a cutback bitumen prime is used.

Sealant: - A bitumen emulsion to cover the pothole once fixed to prevent moisture ingress at the edges and to seal off the top surface.

Plant and equipment requirements

Item	Number of items
Tape measure	1
Crayons	1 box
Straight edge	1
Shovels	2
Broom	2
Block brush	1
Hand stamper	1
Rake	1

Labour requirements

Below is the typical composition of a small maintenance team required to undertake pothole repairs. It is not possible to give an exact production rate given the nature of the work being

undertaken as routine maintenance. It will depend on the pothole sizes, how far apart they are spaced, the area in which the potholes occur and the traffic volumes on the road.

Activity	Number of workers
Supervisor	1
General labour	4

Additional labour will be required for traffic control. A minimum of 2 flag men will be required with signage to assist in this operation. Stop/go signage and large cones or delineators will be required to demarcate the working area and make it safe for the operation to be undertaken.

Construction

Traffic control

The road will need to be barricaded off in the correct manner to allow for the work to be undertaken in a safe manner, especially where the work is undertaken under traffic. The signage can be moved immediately to the next pothole location once the pothole has been repaired. This operation needs to be coordinated by the supervisor to ensure an efficient and safe operation.

Site Preparation

The area that will be removed around the pothole should be marked out using the straight edge and crayons. This marked out area should be in the shape of a square or rectangle with sides parallel to the road edge. Care should be taken to ensure that the area marked out covers the full extent of the damaged zone.

Excavation and preparation

Using a pick, the surfacing should be chipped out up to the edge of the crayon markings. This may require that some sound surfacing will have to be removed. All the loose material should be removed to a depth of at least 40 mm if only surface damage is being repaired.

The exposed areas should be broomed to remove all loose material and dust to ensure that a good bond of the backfilling material to the existing pavement layers.

Using the block brush the entire exposed surface should be painted with the tack coat material to provide a bond between the asphalt and the existing material both on the sides and the bottom of the opened area. The tack coat should not be applied in such a thick layer as to leave pools at the bottom of the area. A thin, uniformly applied layer will suffice.

Backfilling the hole

Either hot or cold mix asphalt can be used to repair the hole. Although the basic principles apply to both, some differences will be highlighted below.

Backfilling and compaction with hot mix asphalt

The asphalt must be kept hot for the pothole repair to be effective. To retain the heat of the material for as long as is necessary the heaps should be large and covered with a tarpaulin. Quantities should be ordered as required to avoid a high proportion of wastage due to the asphalt cooling off excessively and having to be discarded..

The asphalt should be placed in the hole and raked level. Allowance should be made for compression of the material during compaction by leaving the asphalt about 10 mm proud of the existing road surface. The asphalt should be compacted with the hand tamper starting from the outer edge working towards the centre. The existing road edge should serve as a guide for attaining the correct level.

The surface of the compacted layer should be tightly knit with no visible holes or large voids.

A plate compactor can also be used should the size of the repair permit it. Although it may ease the compaction procedure it may also result in damage to the surrounding surfacing thus creating the potential for further damage.

The repair surface should be checked for level with the straight edge. A pothole repair having a finished level slightly proud of the adjacent road surface is preferable to one creating a hollow. The proud surface will allow for some additional compaction under traffic especially in the wheel paths of the vehicles.

All loose material should be swept from the surface. To ensure that the patch is waterproof, a sealant should be painted onto the surface to seal off all surface cavities as well as the joint between the existing surfacing and the patch. This will ensure that the repaired patch is waterproof and will not allow water to seep into it.

The hot mix asphalt filled patch can be opened to traffic immediately after the sealant has set. A sprinkling of fine dust of sand can be placed over the sealant to assist in the drying process and preventing the sealant from being spread by the vehicles tyres. This precaution will ensure that the repair has a neat and tidy appearance.

Backfilling and compaction with cold mix asphalt

Having opened the requisite number of bags for the repair being carried out, the material should be exposed to sunlight for some time to warm up and become sufficiently workable for it to be placed and compacted.

The compaction of the repair is the same as that for hot mix asphalt.

It should be noted that where cold mix is used, it should not be opened to traffic immediately after completion because the volatiles of the binder used still need to evaporate for the mix to stiffen. If at all possible traffic should be kept off the patch repair until the following day.

Cleaning up

All the tools should be cleaned after each patch repair to prevent any build up of emulsion and asphalt of the spades and rakes. The block brush should be kept in water during the repair operations and thoroughly rinsed at the end of each day.

Quality control

Two important aspects are the compaction effort and the choice of asphalt.

- The compaction applied to the repair should be carried out in such a manner as not to damage the surrounding layers in any way.
- The choice of asphalt to use.
An advantage of using hot mix asphalt is that it allows the road to be opened to traffic immediately after the repair has been completed. A possible disadvantage is a high proportion of wastage arising from the material having cooled excessively before use. The disadvantage of cold mix asphalt is the delay in opening to traffic only once the volatiles in the binder have evaporated to avoid deformation of the repair.

As with all repairs to roads under traffic, it is vitally important that road users are aware of the roadworks through proper signage and traffic accommodation