South Central Railway

Headquarters office
Works Branch
Rail Nilayam
Secunderabad.

No:W.287/RUB-Drainage Date : 07.10.2020

Sr.DEN/Co/SC,BZA,GTL,GNT,HYB & NED

Sub: Drainage problems at RUBs
Ref: GM VC held on 01.09.20

Divisions have submitted details of RUBs having drainage problem. The same was discussed during the VC held by GM with all the divisions on 01.09.20. Copy of the presentation made by CE/RSW along with enclosures have been sent to all Sr.DENs /DENs. In this connection, all the divisions are advised to take further action, as discussed in the meeting.

1. Necessary remedial actions at the identified RUBs (GTL -10, GNT- 5, SC-1, HYB-1, NED- 8) (as indicated in the annexure to the presentation) may be taken up so that drainage problem at these 25 RUBs is avoided by next monsoon.

2. Some of the RUBs were constructed with vertical clearance of 5m on certain village roads having very less Road traffic. These RUBs are being utilized by pedestrians and bullock cart traffic only. Water logging at such RUBs can either be totally avoided or minimized, if the road level in the RUB is raised by 0.3 to 0.5m. This will also facilitate adequate Hydraulic gradient to the outfall (either natural stream or percolation pit or low lying area) besides avoiding Reverse flow from the stream/ percolation pit to that much extent. Vertical clearance of 4.65 m is generally adequate for all types of vehicles plying in these roads including harvester machines. While raising the road level, it may be ensured that the vertical clearance is not less than 3.60m.

   a) Compacted Granular sub-base material (GSB) can be used to raise the road level, with top 200mm (Minimum) being cement concrete. Suitable re-grading of approach ramps, connected drainage arrangements should also be taken up simultaneously.

   b) Divisions are advised to identify such RUBs, where road level can be raised to overcome the existing water logging problem without affecting the functionality of RUB and to take up raising of road.

3. Drainage Works are in progress at 35 RUBs (GTL-10,GNT-15,NED-10). These works need to be expedited in order to complete them by Dec'20.
4. Instructions conveyed vide PCE Lr.No.W.352/Br/Policy/Subways dt 21.10.2016 shall be followed while preparing the GAD as well as during execution.
5. In order to overcome the drainage problems at RUBs, the following remedial actions can be taken. This list is only indicative. Field engineers can implement any other measures, as deemed fit, as per site conditions and requirements.

5.1 Drainage connected to natural stream –

a. Ensure sufficient hydraulic gradient to the outfall.
b. Spacing of manholes shall not be more than 30m.
c. Drainage pipe of 1.2 m dia (NP-2) shall be used.
d. De-silting of pipes should be ensured before monsoon, as well as during monsoon. Suitable contracts if required for regular desilting of drains should be in place at all the RUBs.
e. **Invert level of drain near RUB should be above the normally observed flood level of the nearby bridge / low lying area to which the drain pipe is connected.**
f. If reverse flow from the stream is observed during heavy rains, pumping should be resorted to until normal flow is restored.
g. Raise the road level in the RUB, if vertical clearance can be reduced, to minimize the water logging in the RUB.

5.2 Drainage connected to percolation pit –

a. Design the percolation pit duly considering the permeability of soil and maximum rain fall records.
b. If required, the existing percolation pit can be widened or augmented with additional percolation pits (duly interconnected).
c. Ensure gravel/boulder filling at the bottom of the pit as per the standard drawing.
d. Percolation pits need to be de-silted before monsoon as well as during the monsoon to ensure designed percolation of water.
e. If possible, connect the drainage to a nearby waterway bridge.
f. Raise the road level in the RUB, if vertical clearance can be reduced, to minimize the water logging in the RUB.
g. Pumping arrangement should be in place to pump the water from the pit during heavy rains.
h. Infiltration well (up to the aquifer) can be drilled in the pit to enhance the water percolation.

5.3 Seepage from weep holes, flow from adjacent areas-

a. If the general ground level is much above the road level, and is sloping towards the RUB, seepage through weep holes of retaining wall/ flow over the retaining wall can happen. Suitable catch water drains/ bunds shall be provided behind such retaining walls to divert the water flow away from the RUB.
b. RCC 'U' shaped retaining wall (which is designed for 100% saturated soil earth pressure) shall be used at all such locations in future.

c. The retaining wall of adequate height should continue up to the hump to prevent entry of water into the RUB. Instructions contained in PCE /SCR letter dt. 21.10.2016 in this aspect may be adhered to.
d. An RCC pipe of 600mm dia shall be provided in the approach road behind the hump to ensure flow of rain water from one side to the other side of the road.
e. Pumping arrangement should be in place to pump the water from the sump during heavy rains.

5.4 General maintenance practices –

a. Kutcha drains made in clayey soils are likely to collapse during heavy rains. These drains require frequent attention. Such kutcha drains can be dry pitched to prevent collapsing. They shall preferably in trapezoidal shape. Replace the kutcha drains with pucca drains (masonry/ concrete) wherever essential.
b. Percolation pits shall be suitably barricaded and warning boards should be exhibited around them.
c. Percolation pits need to be de-silted regularly.
d. Suitable warning board indicating the height restriction in the subway shall be erected at least 50m before the height gauge. Red coloured retro-reflective strips shall be provided to the height gauges to warn the height limitation to road user in night time. .
e. Pumping capacity should be commensurate with the seepage / water flow into the RUB. Agencies for pumping shall be in place before monsoon. Permanent arrangements for pumping shall be made at all identified RUBs where pumping becomes inevitable during monsoon. Proper sumps to be constructed at such RUBs, to facilitate pumping from sump.
f. Elevated foot paths shall be provided to facilitate movement of pedestrians during water logging in the RUB.
g. If movement of pedestrians /vehicles/ animals is risky through a waterlogged RUB/LHS, such RUB/LHS shall be barricaded until the water is drained out. A stationary watchman, lighting and guidance boards shall be provided at all such locations.

6. Cover shed on approach ramps can be provided, if Natural ground is sloping away from RUB location, to restrict rain water entering into RUB .
7. Backfill material behind boxes, walls shall be as per CBE letter No. W71/ Br/ Bridge policy dt 30.6.2020.

8. These instructions are only supplemental to the instructions contained in PCE letter No. W.352/Br/Policy/Subways dt 21.10.2016, Director (B&S) Railway Board letter No. 2017/CE-IV/ RUB/ 88 dt 24.9.2019, PCE letter No. W 352/ BR/ policy/ subways dt 18.5.2016 and does not supersede them .

CE(RSW)/SC

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