Title: Condition assessment and performance evaluation of four number of bridges at VPT and formulation of remedial measures

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Scope/Objectives:

(i) Nehru Centenary flyover bridge

- Assessment of damage in bearings and pedestals
- Load testing of identified span for assessing the performance and carrying capacity of the superstructure
- Design of new pedestals and bearings in replacement of the damaged ones

(ii) Ambedkar Centenary flyover bridge and NHAI bridge

- Assessment of existing expansion joints and their operational efficiency
- Load testing of identified span for assessing the performance and carrying capacity of the superstructure
- Design of new expansion joints for the bridge considering the maximum vehicular loading and environmental conditions

(iii) Sardharvallabai Patel Parallel bridge

- Load testing of identified span for assessing the performance and carrying capacity of the superstructure
- Design for provision of footpath to the existing bridge
- Assessment of bearings, pedestals, expansion joints and design for new for replacement of the damaged ones

(iv) Bowstring girder bridge on IBP road

- Vibration testing and measurement of the bridge and recommendations for mitigating excessive vibration
- Load testing of the girder for assessing the performance and carrying capacity of the superstructure

Objectives Achieved/ Progress made:

At first, visual inspection was carried out of the bridge sites and some major observations were made. Instrumentations were carried out at different locations of the bridges. A tripper truck (with different load cases) was positioned at different locations on the bridge span and the strain and deflection responses obtained at critical locations under these load cases was measured. Then, numerical models of the bridges were simulated using the information provided in the drawings and site measurements. The deflection response obtained from the numerical model at the critical locations under different load cases (considered in the field investigations) is validated with the field measurements. IRC loading is then applied on the validated numerical

models and checked for safety. Fig. 1(a)-(d) shows the general view, distresses in bridges, instrumentations and loading of the bridges.

From the visual, field and numerical investigations of the bridges, some alarming sign of distresses in bearings, pier cap, pedestal, rupture of prestressing cable are envisaged. Hence, to continue the limited traffic over bridge, appropriate suitable retrofitting schemes were recommended.

(a) Nehru Centenary flyover bridge

(b)Ambedkar Centenary flyover bridge

(c) Sardharvallabai Patel Parallel bridge

(d) Bowstring girder bridge

Fig. 1: General view of the bridges