

WESTERN RAILWAY

Recommendations of Audit carried out by IIT Bombay & inspection of Railway for ROBs in Churchgate-Virar section & action taken as on 31-04-2021

For any Safety related observation, Please call / SMS :900449270

Sr. No.	Name of ROB	Date of Inspection by IIT team	Date of report submission	Major recommendations of IIT audit report	Action Taken on Recommendation	Status of Structure
1	MEL-ROB (South)	24-09-2018 & 7-12-2018	22.04.19	1) There is significant overload on both the footpath and overlays on the road surface that is adding significant loads on the structure. 2) The bearings and expansion joints are non - functional and need to be replaced as soon as possible. 3) A proper structural audit shall be done on this bridge to ascertain in greater details the current status of the bridge, after which further recommendations for rehabilitation can be done.	1) Joint inspection has been carried with MCGM Engineer on 16.05.19. It is decided that removing of overlays on the road surface will be done by MCGM. 2) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress. 3) Required maintenance attentions have been given and for the present they are safe for public usage. They are being monitored and if required, health monitoring will be taken up on these structures. 4) The main columns of ROB is repaired by epoxy grouting & the cleaning, greasing of bearings has been done in 2018-19. 5) Epoxy painting has been carried out in 2019-20.	Safe
2	Sandurst Road	24-09-2018 & 7-12-2018	22.04.19	1) There is significant overload on the footpath and overlays on the road surface that is adding significant loads on the structure. 2) Replace Expansion Joints. 3) A proper structural audit shall be done on this bridge to ascertain in greater details the current status of the bridge, after which further recommendations for rehabilitation can be done. 4) It is recommended that the bridge should be planned for Instrumentation, Load Test etc. Health Monitoring should be done once in 06 months till the bridge is replaced.	1) Joint inspection has been carried with MCGM Engineer on 16.05.19. It is decided that removing of overlays on the road surface will be done by MCGM. The work of removing of overlays completed by MCGM including footpath. 2) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress. 3) Required maintenance attentions have been given and for the present they are safe for public usage. They are being monitored and if required, health monitoring will be taken up on these structures. 4) The cleaning, greasing and painting of bearings has been done in 2018-19.	Safe
3	French	24-09-2018 & 7-12-2018	22.04.19	1) There is significant overload on the footpath and overlays on the road surface that is adding significant loads on the structure. 2) Replace Bearings & Expansion Joints. 3) A proper structural audit shall be done on this bridge to ascertain in greater details the current status of the bridge, after which further recommendations for rehabilitation can be done. 4) It is recommended that the bridge should be planned for Instrumentation, Load Test etc. Health Monitoring should be done once in 06 months till the bridge is replaced.	1) Joint inspection has been carried with MCGM Engineer on 16.05.19. It is decided that removing of overlays on the road surface will be done by MCGM. 2) Detailed estimate amounting 35.7 Cr has been advised to MCGM for executing the work. 3) & 4) Required maintenance attentions have been given and for the present they are safe for public usage. They are being monitored and if required, health monitoring will be taken up on these structures. 5) The cleaning, greasing and painting of bearings has been done in 2018-19.	Safe
4	Kennedy	24-09-2018 & 7-12-2018	22.04.19	1) There is significant overload on the footpath and overlays on the road surface that is adding significant loads on the structure. 2) Bearings need cleaning and maintenance and replacement of bearings. 3) Replace Expansion Joints. 4) A proper structural audit shall be done on this bridge to ascertain in greater details the current status of the bridge, after which further recommendations for rehabilitation can be done. 5) It is recommended that the bridge should be planned for Instrumentation, Load Test etc. Health Monitoring should be done once in 06 months till the bridge is replaced.	1) Joint inspection has been carried with MCGM Engineer on 16.05.19. It is decided that removing of overlays on the road surface will be done by MCGM. The work of removing of overlays completed by MCGM. The work is in progress in footpath. 2) & 3) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress. 4) & 5) Required maintenance attentions have been given and for the present they are safe for public usage. They are being monitored and if required, health monitoring will be taken up on these structures. 6) The cleaning, greasing and painting of bearings has been done in 2018-19. 7) The main columns are repaired by epoxy grouting & polymer plaster & north parapet wall repaired by providing additional steel plates in 2017-18. 8) The epoxy painting work is in progress including patch repairs.	Safe
5	Ferere	24-09-2018 & 7-12-2018	22.04.19	1) There is significant overload on both the footpath and overlays on the road surface that is adding significant loads on the structure. 2) The bearings and expansion joints are non - functional and need to be replaced as soon as possible. 3) A proper structural audit shall be done on this bridge to ascertain in greater details the current status of the bridge, after which further recommendations for rehabilitation can be done. 4) It is recommended that the bridge should be planned for Instrumentation, Load Test etc. Health Monitoring should be done once in 06 months till the bridge is replaced.	1) Joint inspection has been carried with MCGM Engineer on 16.05.19. It is decided that removing of overlays on the road surface will be done by MCGM. 2) The requisite fund has been provided by MCGM. The work of regirdering is awarded & completed on 30-11-2020. 3) Bridge has been referred to IIT Bombay for proper structural audit. 4) The connections of main girders & cross girder are repaired by providing additional brackets and barricading the both footpaths including providing height gauge for restricted the heavy vehicles in 2nd October 2019. 5) Now the bridge has been closed for Road traffic on 16.01.2020 for regirdering including rehabilitation of substructure. The girder has been launched on 25-08-2020. The work of regirdering is completed since 30-11-2020.	Closed for Road traffic for regirdering on 16.01.2020. Regirdering completed.

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6	Falkland	24-09-2018 & 7-12-2018	22.04.19	<ol style="list-style-type: none"> 1) There is significant overload on the footpath and overlays on the road surface that is adding significant loads on the structure. 2) Replace Expansion Joints. Replace the bearings with new bearings. 3) A proper structural audit shall be done on this bridge to ascertain in greater details the current status of the bridge, after which further recommendations for rehabilitation can be done. 	<ol style="list-style-type: none"> 1) Joint inspection has been carried with MCGM Engineer on 16.05.19. It is decided that removing of overlays on the road surface will be done by MCGM. 2 & 3) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress. 4) Required maintenance attentions like have been given and for the present they are safe for public usage. They are being monitored and if required, detailed structural audit will be taken up on these structures. 5) The cleaning, greasing and painting of bearings has been done in 2018-19. 6) The epoxy painting of ROB has been carried out in June 2020. 	Safe
7	Bellasis ROB	24-09-2018 & 7-12-2018	22.04.19	<ol style="list-style-type: none"> 1) The support area and bottom plates which are heavily corroded should be rehabilitated by adding additional plates, angles etc. 2) The entire bridge should be provided with High-Build zinc-rich coating system with very high quality surface preparation and washing. 3) The end I girders should be replaced. The bearing area of I girders should be rehabilitated. The bearing should be replaced and bearing area strengthened. 4) There is significant overload on the footpath and overlays on the road surface that is adding significant loads on the structure. 5) Replace Expansion Joints. 6) A proper structural audit shall be done on this bridge to ascertain in greater details the current status of the bridge, after which further recommendations for rehabilitation can be done. 7) It is recommended that the bridge should be planned for Instrumentation, Load Test etc. Health Monitoring should be done once in 06 months till the bridge is replaced. 	<ol style="list-style-type: none"> 1) At the support area the corroded dia pharam are replaced by new angle, Plates etc 2) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress. 3) End of girders repaired at the various location where it was feasible for repairing. 4) Joint inspection has been carried with MCGM Engineer on 20.05.19. It is decided that removing of overlays on the road surface will be done by MCGM. 5) Detailed estimate amounting 35.7 Cr has been advised to MCGM for executing the work . 6) Bridge proposed for proper structural audit wherein Health monitoring will also be carried out by IIT Bombay, if required after structural audit. MCGM entrusted rebuilding of this ROB by MRIDCL. 7) Bridge has been referred to IIT Bombay for proper structural audit. 8) The major strengthening work of steel structure since done in 2017-18 . 	Safe
8	MX-ROB	25-09-2018 & 8-12-2018	22.04.19	<ol style="list-style-type: none"> 1) The west side span need rehabilitation by adding additional plates, angles etc. 2) Replace the bearings with new bearings. 3) There is significant overload on the footpath and overlays on the road surface that is adding significant loads on the structure. 4) The cantilever triangular portion on Dadar end on West side which is unsafe should be demolished and the advertisement boards erected on it should be removed to reduce load on the dilapidated triangular portion of the bridge. 5) Replace Expansion Joints. 6) The entire bridge should be provided with High-Bid zinc-rich coating system with very high quality surface preparation and washing. 7) A proper structural audit shall be done on this bridge to ascertain in greater details the current status of the bridge, after which further recommendations for rehabilitation can be done. 8) It is recommended that the bridge should be planned for Instrumentation, Load Test etc. Health Monitoring should be done once in 06 months till the bridge is replaced. 	<ol style="list-style-type: none"> 1) The west-south two girders are strengthened by providing the additional plates, angles etc 2) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress. 3) Joint inspection has been carried with MCGM Engineer on 17.05.19. It is decided that removing of overlays on the road surface will be done by MCGM. Offloading work of footpaths is in progress by MCGM. 4) The advertisement boards were removed and dismantling of cantilever triangular portion has been completed in January 2020 & strengthening work of triangular portion of ROB is in progress. 5) & 6) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress. 7) Bridge has been referred to IIT Bombay for proper structural audit. MCGM entrusted rebuilding of this ROB by MRIDCL. 8) Health monitoring will also be carried out, if required after structural audit discussed in para (7) above. 9) The major strengthening work of steel structure since done in 2017-18 & the north & south cantilever portion dismantling work in progress for offloading of cantilever by MCGM. 	Safe
9	EPR-ROB(Carol Road)	26-09-2018 & 8-12-2018	22.04.19	<ol style="list-style-type: none"> 1) There is significant overload on the footpath and overlays on the road surface that is adding significant loads on the structure. 2) Replace Expansion Joints. Replace the bearings with new bearings. 3) The entire bridge should be provided with High-Build zinc-rich coating system with very high quality surface preparation and washing. 4) A proper structural audit shall be done on this bridge to ascertain in greater details the current status of the bridge, after which further recommendations for rehabilitation can be done. 5) It is recommended that the bridge should be planned for Instrumentation, Load Test etc. Health Monitoring should be done once in 06 months till the bridge is replaced. 	<ol style="list-style-type: none"> 1) Joint inspection has been carried with MCGM Engineer on 17.05.19. It is decided that removing of overlays on the road surface will be done by MCGM. Additional brackets has been provided to hold the steel footpath in safe position. 2) & 3) Detailed estimate amounting 35.7 Cr has been advised to MCGM for executing the work . 4) Bridge proposed for proper structural audit by IIT Bombay. MCGM entrusted rebuilding of this ROB by MMRDA. 5) Instrumentation and Health monitoring will also be carried out, if warranted after detailed structural audit. 6) The major strengthening work of steel structure since done in 2017-18 & additional brackets are provided to hold the both footpaths in 2019-20. 	Safe

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10	Tilak ROB	26-09-2018 & 8-12-2018	22.04.19	<ol style="list-style-type: none"> 1) The bridge can be rehabilitated. The substructure is sound. 2) There is significant overload on the footpath and overlays on the road surface that is adding significant loads on the structure. 3) The MCGM bridge which is on the West side over the road is in a precarious condition. MCGM should replace the bridge before it is too late. 4) Replace Expansion Joints. Replace the corroded bearing plates. 5) The entire bridge should be provided with High-Bid zinc-rich coating system with very high quality surface preparation and washing. 6) A proper structural audit shall be done on this bridge to ascertain in greater details the current status of the bridge, after which further recommendations for rehabilitation can be done. 7) It is recommended that the bridge should be planned for Instrumentation, Load Test etc. Health Monitoring should be done once in 06 months till the bridge is replaced. 	<ol style="list-style-type: none"> 1) It is kept into consideration while rehabilitation of this bridge. 2) Joint inspection has been carried with MCGM Engineer on 17.05.19. It is decided that removing of overlays on the road surface will be done by MCGM. 3) It is advised to MCGM to take immediate necessary action. 4) & 5) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress. 6) Bridge proposed for proper structural audit by IIT Bombay. MCGM entrusted rebuilding of this ROB by MRIDCL. 7) Instrumentation and Health monitoring will also be carried out, if warranted after detailed structural audit. 8) The major strengthening work of steel structure since done in 2016. 9) The unsafe staircase (E) connected with ROB demolished in 2019-20. 10) The off-loading of north footpath is completed & off loading of south footpath is in progress. 	Safe
11	MRU-ROB	05-12-2018	17.06.19	<ol style="list-style-type: none"> 1) MCGM should be advised to replace the expansion joints of the entire bridge and they must rehabilitate the bridge in their territory on priority. 2) There is significant overload on overlays on the road surface that is adding significant loads on the structure. It should be removed. 3) The bearings need to be replaced as soon as possible. 4) The concrete in the cover portion of the underside of PSC girders shall be repaired by lifting of girders, cleaning the reinforcement, apply rust passivator and rebuild the surface with epoxy mortar. 5) A proper structural audit and Non - Destructive Testing (NDT) shall be done on this bridge to ascertain in greater details the current status of the bridge, after which further recommendations for rehabilitation can be done. 	<ol style="list-style-type: none"> 1) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress. 2) Joint inspection has been carried with MCGM Engineer on 17.05.19. It is decided that removing of overlays on the road surface will be done by MCGM. 3) & 4) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress. 5) Required maintenance attentions have been given and for the present they are safe for public usage. They are being monitored and if required, health monitoring will be taken up on these structures. 	Safe
12	Dharavi ROB	25-02-2020	16-03-2020	<ol style="list-style-type: none"> 1) The RCC is cracked at several places. 2) The Pier is in very unsatisfactory condition. It should be repaired/rehabilitated "On Urgent Basis". 3) There should be a through rehabilitation of the bridge. Bearings should be replaced. Bearing pedestals, girder bottom over the bearings to be repaired. 4) The Bridge is "Not Sound". 5) It is recommended to do the instrumentation and load test of the bridge to monitor the health of the bridge. 	<ol style="list-style-type: none"> 1) External Pre-stressing of south girder completed. 2) The epoxy painting work is completed. 3) The work of strengthening of pier is in progress. 4) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress. 5) Bridge proposed for proper structural audit wherein Health monitoring will also be carried out by IIT Bombay, if required after structural audit. 6) Bridge has been referred to IIT Bombay for proper structural audit. 	Safe
13	BA-ROB (Old) (Kalanagar)	08-12-2018	17.06.19	<p>The Bridge i.e. old Bandra bridge is not in sound condition and needs rehabilitation on urgent basis. The cantilever portion on Mahim end is unsafe and should be demolished. If the rehabilitation is likely to get delayed more than three months, it may be advisable to restrict the loading (axle load to 16 T and traffic speed to 50kmph) over the old bridge.</p> <ol style="list-style-type: none"> 1) The foot path portion supported on cantilevers is unsafe and must be closed for both road and pedestrian traffic by erecting strong railing system. It is recommended to remove this portion to avoid any mishap. 2) The extra heavy burden of 250 mm added over the years by road authorities must be removed immediately which is causing overloading over the bridge, and holding of moisture and causing seepage in deck slabs leading to severe corrosion and spalling of concrete. 3) Repairs to substructure and RCC deck slabs: <ol style="list-style-type: none"> i) Remove plaster from entire surface on both abutments and piers. ii) Concrete Repair - Chip weak and honeycombed concrete on abutments and on bearing pedestals, clean the surface reinforcement with wire brush, apply rust passivator, clean the surface with hot water and rebuild entire concrete surface with polymer modified cement mortar. iii) Grout abutments and piers along with pedestal with cement grout. 4) The steel cantilevers supporting RCC footpath and RCC beam and slab on Mahim end are unsafe and should be demolished. 5) Replace corroded steel bearing plates with new plates and all bearings with new elastomeric bearings. 6) Clean debris from expansion joint and replace them with 'Strip Seal' type expansion joint. 	<p>The cantilever portion has been reduced and supporting steel brackets have been removed. Thus the bridge is safe for public usage.</p> <ol style="list-style-type: none"> 1) As discussed above, the cantilever portion of foot path has been reduced and made safe. A new crash barrier has also been provided. 2) Joint inspection has been carried with PWD Engineer on 18.07.19. It is decided that removing of overlays on the road surface will be done by MCGM. 3) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress. 4) As discussed above, the cantilever portion of foot path 3.8m wide has been reduced and made safe. A new crash barrier has also been provided in 2019-20. The metalising of girder has been carried out in 2017. 5) & 6) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress. 	Safe
14	BA-ROB (New) (Kalanagar)	08-12-2018	17.06.19	<p>The bridge i.e. new bandra bridge is in sound condition.</p> <ol style="list-style-type: none"> 1) The extra heavy burden of 250 mm added over the years by road authorities must be removed immediately which is causing overloading over the bridge, and holding of moisture and causing seepage in deck slabs. 2) Repairs to cracks in Abutment -2(A2). It is recommended to expose the cracks and repaired by cutting "V" groove. The surface can be rebuilt with polymer modified cement mortar. 3) Repairs to RCC columns: Chip weak and leached concrete surface, clean the surface with hot water and rebuild concrete surface with polymer modified cement mortar. 4) It is recommended to lift entire super-structure with jacks. To replace corroded steel plates with new plates and distressed deformed elastomeric bearings. 5) It is recommended to provide missing bolts/rivets between main and cross girder. 6) Expansion joint shall be opened and cleaned and may be planned for replacement with new 'Strip-Seal' type expansion joint. 	<ol style="list-style-type: none"> 1) Joint inspection has been carried with PWD Engineer/ MCGM on 17.05.19. It is decided that removing of overlays on the road surface will be done by MCGM. 2) to 6) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress. 	Safe
15	Milan ROB		17.06.19	<ol style="list-style-type: none"> 1) Dumping of debris, muck, husk etc. by outsides should be stopped. The already dumped materials should be removed. Provide warning boards. 2) Provide boxes around the bearings for preventing ingress of dust and water. 3) Drainage between girder no 2 and 3 needs to be provided to avoid corrosion of bottom flanges of these girders (Which had been covered by concrete and now has become dumping ground). 	<ol style="list-style-type: none"> 1) Joint inspection has been carried with MCGM Engineer on 16.05.19. It is mutually agreed that debris muck etc. will be removed by MCGM. Muck has been removed by Railway. 2) & 3) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress. 	Safe

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16	Parle Biscuit		17.06.19	<ol style="list-style-type: none"> 1) Restore the drainage system of the bridge. 2) The cracked portion of pier shall be repaired by chipping weak concrete and rebuilt the surface with polymer modified cement plaster. 3) The PSC girder should be repaired on priority. The honey combed area should be chipped, steel exposed and cleaned, add steel bar to make up for the lost area, apply rust convertor, plaster with polymer modified mortar to prevent leakage of grout and provision of coverthen grout hollows in concrete by polymer modified cement grout or epoxy. 4) The expansion joints should be cleaned and make watertight. 5) A proper structural audit and Non-Destructive Testing (NDT) shall be done on this bridge to ascertain in greater details the current status of the bridge, after which further recommendations for rehabilitation can be done. 	<ol style="list-style-type: none"> 1) Joint inspection has been carried with MCGM Engineer on 16.05.19. It is advised to restore the drainage system. 2) Necessary repair of pier was carried out. 3) Epoxy mortar and grout on PSC girder was carried out . (4) Detailed estimate amounting 35.7 Cr has been advised to MCGM for executing of work after receipt of IIT report on ROB portion under W.Rly. Jurisdiction. 5) Required maintenance attentions have been given and for the present they are safe for public usage. They are being monitored and if required, health monitoring will be taken up on these structures. 6) The epoxy painting work is completed in December 2019. 	Safe
17	ADH-ROB (Gopalkrishna Gokhale)		17.06.19	<ol style="list-style-type: none"> 1) There is significant overload on both the footpath and overlays on the road surface that is adding significant loads on the structure. Since, the footpaths have been replaced now; the overload over the deck should also be removed. 2) At present the deck drainage is faulty and it needs detailed survey, planning and execution. 3) Top surface of Abutments shall be repaired by chipping weak and honeycombed concrete, cleaning the reinforcement, rebuilt the surface with polymer modified cement mortar. 4) The bottom flanges of end steel girder and cross bracings should be strengthened by adding cover plates. 5) The columns bracings and top frames between columns need strengthening. 6) The painting of steel elements should be done with quality surface preparation. 7) The wedges blocking functioning of bearing be removed. The bearings should be replaced both place and POT/PTEE. The present bearing maintenance being done in suburban section is only cleaning and painting of visible area which is totally deceptive. 8) The area near bearing (about 1m in length at ends) of steel girders which is most likely corroded with loss of section should be strengthened at the time of replacing expansion joints, bearings and deck slab. 9) The concrete in deck slab should be rehabilitated. It is recommended to replace the entire deck slab and strengthen the top flanges of the steel girders by adding cover plates. 10) the expansion joints are non-functional, leaking and causing corrosion of rebar of deck slab and steel in the bearing area and need to be replaced. 11) Diaphragms of deck slab and parapet wall shall be repaired by chipping weak and honeycombed concrete, cleaning the reinforcement , rebuilt the surface with polymer modified cement mortar. 12) A proper structural audit and Non-Destructive Testing (NDT) shall be done on this bridge to ascertain in greater details the current status of the bridge, after which further recommendations for rehabilitation can be done. 	<ol style="list-style-type: none"> 1) Joint inspection has been carried with MCGM Engineer on 16.05.19. It is decided that removing of overlays on the road surface will be done by MCGM. 2) Detailed survey of road drainage to be done by MCGM. MCGM advised to do it early. 3) Top surface of Abutments has been repaired. 4) & 5) The work of strengthening of bottom flanges, cross bracing and column bracing is in progress. 6) The painting of steel girder is in progress. 7) Wooden block already removed. 8) , 9) & 10) Detailed estimate amounting 35.7 Cr has been advised to MCGM for executing of work . 11) Repairs to Diaphragms of deck slab had been carried out. 12) Required maintenance attentions have been given and for the present they are safe for public usage. They are being monitored and if required, health monitoring will be taken up on these structures. 	Safe
18	GMN-ROB (Vir Savarkar)		17.06.19	<ol style="list-style-type: none"> 1) The extra heavy burden added over the years by road authorities must be removed immediately which is causing overloading over the bridge, and holding of moisture and causing seepage in deck slabs leading to severe corrosion and spalling of concrete. 2) Repairs to concrete of pier-3, Diaphragms and RCC deck slab soffit and ends by chipping weak and honeycombed concrete, clean the surface reinforcement with wire brush, apply rust passivator, clean the surface with water and rebuilt entire concrete surface with polymer modified cement mortar. 3) Replace elastomeric bearings. While replacing the bearings repair the end 1m area of PSC girder and the underside bearing surface area of the girders and top of bearings pedestals by epoxy mortar. 4) Clean debris from expansion joint and replace them with 'Strip Seal' type expansion joint. 5) It is recommended to do detailed instrumentation, Non-Destructive Testing (NDT) and load test tc. to decide the rehabilitation scheme for the end girders. 	<ol style="list-style-type: none"> 1) Joint inspection has been carried with MCGM Engineer on 13.06.19 for removal of extra heavy over burden. 2) , 3) & 4) - The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress. 5) The structure is safe for public use for the present. It is being monitored and if required instrumentation including Health monitoring will be carried out. 	Safe
19	Sudhir Phadke ROB		17.06.19	<ol style="list-style-type: none"> 1) The extra heavy burden added over the years by road authorities must be removed immediately which is causing overloading over the bridge, and holding of moisture and causing seepage in deck slabs leading to severe corrosion and spalling of concrete. Similarly, overloading on footpath should be checked are removed if in excess. 2) The concrete cap beam should be repaired by chipping weak and honeycombed concrete, clean the surface with water and rebuilt the surface with polymer modified cement mortar and grout by polymer modified cement grout. 3) Replace elastomeric bearings. While replacing the bearings repair the end 1m area of PSC girder and the underside bearing surface area of the girders and top of bearings pedestals by epoxy mortar. 4) Clean debris from expansion joint and replace them with 'Strip Seal' type expansion joint. 5) A proper structural audit and Non-Destructive Testing (NDT) shall be done on this bridge to ascertain in greater details the current status of the bridge, after which further recommendations for rehabilitation can be done. 	<ol style="list-style-type: none"> 1) Joint inspection has been carried with MCGM Engineer on 13.06.19. It is decided that removing of overlays on the road surface will be done by MCGM. 2) Concrete cap beam repairing has been completed. 3) & 4) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress. 5) Required maintenance attentions have been given and for the present they are safe for public usage. They are being monitored and if required, health monitoring will be taken up on these structures. 	Safe
20	Bhayander ROB	12/11/2018	17.06.19	<ol style="list-style-type: none"> 1) The girder, distress the elastomeric bearings, clean them and replace if there is some distressed bearing. While lifting the girders, repairs the bearing seat of PSC girder with epoxy mortar. 2) Diaphragms connecting PSC beams and parapet wall shall be repaired by chipping weak and honeycombed concrete, clean the surface reinforcement with wire brush, apply rust passivator, clean the surface with water and rebuilt entire concrete surface with polymer modified cement mortar. 3) The minor cracks in deck slab should be repaired by cutting 'V' notch and fill up with epoxy mortar. 4) Clean the expansion joint. 5) Utilities shall be covered properly. 	<ol style="list-style-type: none"> 1) & 2) IIT report has been sent to MBMC & Joint inspection has carried out with MBMC Engineer, repairs has been planned. 3) Repair work is completed. The epoxy painting has been completed in October 2020. 4) & 5) These works have already been organised and will be completed. 	Safe

Sr. No.	Name of ROB	Date of Inspection by IIT team	Date of report submission	Major recommendations of IIT audit report	Action Taken on Recommendation	Status of Structure
21	Vasai ROB	9/29/2018	17.06.19	<p>1) Abutment shall be repaired by chipping weak concrete, cleaning the reinforcement with wire brush, apply rust passivator and rebuild the surface with polymer modified cement mortar.</p> <p>2) Repairs to columns: a) RCC columns should be rehabilitated by chipping cracked, weak, environmentally affected and honeycombed concrete.</p> <p>3) The extra heavy burden added over the years by road authorities must be removed immediately which is causing overloading over the bridge, and holding of moisture and causing seepage in deck slabs leading to severe corrosion and spalling of concrete.</p> <p>4) Repairs to steel elements: a) It is necessary to make 3 trial pits and observe the condition of corrosion of top flange. If it is showing loss of section, then the deck slab should be demolished, additional flange plate welded and new deck slab provided. b) It is recommended to clean the rust, do perfect surface preparation and apply high-bid performance coating system (zinc-rich primer, epoxy intermediate coat and polyurethane top coat) on steel members which will give a life of 30 to 40 years.</p> <p>5) Repairs to bracings: Replace corroded steel bearing plates and all elastomeric bearings.</p> <p>6) Clean debris from expansion joint and replace them with 'Strip Seal' type expansion joint.</p> <p>7) The parapet wall is unsafe and should be demolished and reconstructed.</p> <p>8) A proper structural audit and Non-Destructive Testing (NDT) shall be done on this bridge to ascertain in greater details the current status of the bridge, after which further recommendations for rehabilitation can be done.</p>	<p>1), 5) & 6) IIT report has been sent to PWD & Joint inspection will be carried out with PWD Engineer repair will be planned after inspection.</p> <p>2) & 4) - Repair work by jacketing of columns is completed.</p> <p>3) Executing Engineer PWD has been asked to remove the over burden.</p> <p>7) Old Parapet wall has been cut & removed with cantilever slab. New anti crash barrier work is completed.</p> <p>8) Required maintenance attentions have been given and for the present they are safe for public usage. They are being monitored and if required, health monitoring will be taken up on these structures.</p>	Safe
22	Nallasopara ROB	12/11/2018	17.06.19	<p>1) The extra heavy burden added over the years by road authorities must be removed immediately which is causing overloading over the bridge, and holding of moisture and causing seepage in deck slabs leading to severe corrosion and spalling of concrete.</p> <p>2) The bearing pedestals shall be repaired by chipping weak and honeycombed concrete, clean the reinforcement with wire brush, apply rust passivator, apply bond coat and rebuild the surface with epoxy mortar.</p> <p>3) POT/PTFE bearings should be replaced.</p> <p>4) While replacing the bearings repair the end 1m area of PSC girders and the underside bearing surface area of the girders and top of bearing pedestals by epoxy mortar.</p> <p>5) Clean debris from expansion joint and replace them with 'Strip Seal' type expansion joint.</p>	<p>1) Executing Engineer VVCMC has been asked to remove the over burden.</p> <p>2), 3), 4) & 5) - IIT report has been sent to VVCMC & Joint inspection will be carried out with VVCMC Engineer.</p> <p>6) The work for providing inspection arrangement is completed. The necessary repairs & epoxy painting work has been completed on 15-04-2021.</p>	Safe
23	Anand Nagar ROB	12/11/2018	17.06.19	<p>1) The extra heavy burden added over the years by road authorities must be removed immediately which is causing overloading over the bridge, and holding of moisture and causing seepage in deck slabs leading to severe corrosion and spalling of concrete.</p> <p>2) The bearings shall be greased at regular interval for proper functioning.</p> <p>3) Diaphragms connecting PSC beams and parapet wall shall be repaired by chipping weak and honeycombed concrete, clean the surface reinforcement with wire brush, apply rust passivator, clean the surface with water and rebuild entire concrete surface with polymer modified cement mortar.</p> <p>4) Clean debris from expansion joint.</p>	<p>1) Joint inspection has been carried with MCGM Engineer on 13.06.19. It is decided that removing of overlays on the road surface will be done by MCGM.</p> <p>2), 3) & 4) - Detailed estimate amounting 35.7 Cr has been advised to MCGM for executing the work.</p> <p>5) The epoxy painting is carried out in May 2020.</p>	Safe
24	Virar ROB	12/11/2018	17.06.19	<p>1) While replacing the bearings repair the end 1m area of PSC girders and the underside bearing surface area of the girders and top of bearing pedestals by epoxy mortar.</p> <p>2) The deck slab soffit may be repaired in the same manner as suggested in repairing of capping beam along with grouting the slab with polymer grout or deck slab should be replaced.</p> <p>3) Clean debris from expansion joint and replace them with 'Strip Seal' type expansion joint.</p>	<p>1), 2) & 3) IIT report has been sent to VVMC & Joint inspection will be carried out with VVCMC Engineer. The work is awarded & will be carried out after monsoon for repairing & epoxy painting work.</p> <p>4) The work for providing inspection arrangement is completed. The necessary repairs & epoxy painting work has been completed on 20-01-2021.</p>	Safe
25	Thackeray ROB	16.11.19	03.12.19	<p>1. For steel section: a) For rust removal: Wash the bridge thoroughly by high pressure jet to remove layers of rust, dust, dirt from steel elements and connections. This will help in identifying all the defects which are now covered by rust, dust and contaminants. b) For corrosion: the steel elements of entire bridge should be provided with coating system only after proper surface preparation.</p> <p>2) Provide proper drainage system on the bridge.</p>	<p>1) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress.</p> <p>2) Joint inspection has been carried with MCGM Engineer on 13.06.19. It is decided that proper drainage will be done by MCGM.</p>	Safe
26	Mrinal Tai ROB	16.11.19	03.12.19	<p>1. For steel section: a) For rust removal: Wash the bridge once a year thoroughly by high pressure jet to remove layers of rust, dust, dirt from steel elements and connections. This will help in identifying all the defects which are now covered by rust, dust and contaminants. b) For corrosion: the steel elements of entire bridge should be provided with coating system only after proper surface preparation.</p> <p>2) Provide proper drainage system on the bridge.</p> <p>3) Temporary structures below the ROB should be removed "On urgent Basis."</p>	<p>1) Detailed estimate amounting 35.7 Cr has been advised to MCGM for executing the work.</p> <p>2) & 3) Joint inspection has been carried with MCGM Engineer on 13.06.19. It is decided that proper drainage will be done by MCGM. Structure below ROB will be removed.</p>	Safe

Sr. No.	Name of ROB	Date of Inspection by IIT team	Date of report submission	Major recommendations of IIT audit report	Action Taken on Recommendation	Status of Structure
27	Rajguru ROB	16.11.19	03.12.19	<p>1) RCC diaphragms shall be repaired by chipping weak or honeycombed concrete, apply bond coat and rebuilt the surface with polymer modified high strength mortar.</p> <p>2) It is recommended to lift entire superstructure with jacks. After lifting, damaged pedestals shall be repaired by removing cracked or repaired concrete. Chipped the concrete upto 25mm behind the reinforcement. The reinforcement steel shall be cleaned off all loose corrosion mass by steel hard brush. Apply rust passivator on the reinforcement. Apply bond coat on concrete surface. The concrete shall then be repaired with polymer modified high strength add with bio polar chemical.</p> <p>3) All the bearings shall be replaced with new neoprene bearings .</p> <p>4) Provide proper drainage system on the bridge.</p>	<p>1) Detailed estimate amounting 35.7 Cr has been advised to MCGM for executing the work.</p> <p>2) Joint inspection has been carried with MCGM Engineer on 13.06.19. It is decided that proper drainage will be done by MCGM.</p> <p>3) The epoxy painting work is completed in December 2019.</p>	Safe
28	Dattapada ROB	16.11.19	03.12.19	<p>1) For Corrosion- The steel elements of entire bridge should be provided with coating system only after proper surface preparation.</p> <p>2) For pier caps- Remove cracked concrete. The concrete shall then be repaired with polymer modified high strength mortar.</p> <p>3) RCC diaphragms shall be repaired by chipping weak or honeycombed concrete, apply bond coat and rebuilt the surface with polymer modified high strength mortar.</p> <p>4) Provide proper drainage system on the bridge.</p>	<p>1) The 50% of requisite fund has been provided by MCGM. The work is awarded & in progress.</p> <p>2) Joint inspection has been carried with MCGM Engineer on 13.06.19. It is decided that proper drainage will be done by MCGM.</p> <p>3) The epoxy painting work is completed in May 2019.</p>	Safe
29	Vasai Road New ROB	09.05.20	25.05.20	<p>1) For RCC Elements:</p> <p>a) Chip honeycombed and weathered concrete.</p> <p>b) Clean the surface with water.</p> <p>c) Apply bond coat on the old concrete surface.</p> <p>d) The concrete shall then be repaired with polymer modified high strength mortar added with bipolar chemical.</p> <p>2) The steel elements on the bridge main need "Preventive Maintenance".</p> <p>3) Expansion joints need cleaning and maintenance on periodic basis.</p>	<p>1) & 2) IIT report has been sent to VVCMC & Joint inspection will be carried out with VVCMC Engineer. The work is awarded & work is in progress.</p> <p>3) It will be cleaned & ensured.</p>	Safe