



राष्ट्रीय ग्रामीण अवसंरचना विकास एजेंसी  
( ग्रामीण विकास मंत्रालय, भारत सरकार )

**National Rural Infrastructure Development Agency**  
(Ministry of Rural Development, Govt. of India)

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**DO Letter No. NRRDA-P011 (11)/2/2021-Dir(Tech) (E:375735) Date: 30.05.2021**

**Subject: Common DPR observations in Bridge DPRs under PMGSY/RCPLWE – Regarding.**

**Dear Madam/Sir,**

It is to inform you that the common observations found during the examination of road DPRs at NRIDA have been communicated to the SRRDAs and STAs through Pre EC/ EC Meetings and letters. In the recent past, the State Governments are proposing a higher number of bridges due to the enhancement of bridge length to be considered under PMGSY/RCPLWE. In order to prepare good quality and cost-effective DPR, NRIDA has hiked the DPR preparation charges for roads and bridges and communicated vide this office Lr.No. NRIDA-P010(21)/1/2018-Technical (361224) dated 19.03.2020. Also, the State Governments were permitted to prepare the DPRs through outsourcing by engaging qualified consultants for the preparation of DPRs of bridge and road works under PMGSY and RCPLWE duly following the Quality Cum Cost Based Selection System (QCBS). Despite the efforts taken by the NRIDA, the quality of most of the DPRs submitted by the State Governments is not up to the standards. On the examination of sample Bridge DPRs at NRIDA, the most common observations noticed are listed below.

1. There are no Index and page numbers given in the DPR due to which it becomes difficult to locate the Topic/Drawing/Figure. All pages must be numbered and duly filled under heading page number in the list of Chapters, paragraphs, sub-paragraphs, figures, formats, and annexures, etc.
2. Some of the DPRs are not being prepared as per the standard Template.
3. Package no and Bridge Chainage/RD should be written at front page followed in other chapter/Proforma etc., in DPR.
4. Hydraulic survey/ Hydraulic data such as L-section, X-sections are not found attached to some of the DPRs. Without calculation of Catchment Area by gathering local information and topographical survey data and other important data, hydraulic design parameters viz. Discharge, Velocity, Scour Depth, Linear Waterway, Afflux, Foundation Levels, Height of abutment and piers, etc cannot be calculated. Hence, calculation of catchment area from levels/ toposheet and detailed hydraulic design as per IRC 5:2015 and IRC SP: 13:2004 shall be carried out and included in the DPR.
5. The latest rainfall data of the region shall be used in hydrological studies/computing discharges shall be included in the DPRs.

6. In some of DPRs, higher number of CD works are proposed without any justification. Based on computed run-off, number and location of culverts/bridges shall be assessed. All existing culverts/bridges shall be assessed for sufficiency in size and strength and their capability of taking loads of relevant IRC vehicle class. If required, tests to assess residual concrete strength, reinforcement cover sufficiency, reinforcement corrosion, soil properties should be undertaken. Based on this, decision for reconstruction / strengthening of existing culverts/bridges shall be taken. Condition of all existing CD structures shall be included in DPR. Detailed justification for replacement of existing CD structure with new one shall be given. Further, the reasons for not repairing/strengthening of existing CD structure shall also be given in the DPR.
7. Insufficient number of boreholes are made for geotechnical investigation in abutment and pier locations in some of the DPRs. One borehole for each abutment and pier location should have been made for better representation of soil. The location plan for boreholes needs to be attached with the DPR. Hence, detailed investigation of the soil is required to be made based on more Boreholes.
8. Geotechnical Investigation Report is incomplete/ missing. There are no recommendations for the Safe Bearing Capacity (SBC) and type of foundation with levels. Also, in some cases, different type of foundation is selected for construction in place of recommended type in the soil investigation report. However, the reasons for the same have not been recorded in the DPR. In some cases SBC indicated in the soil investigation report does not match with the SBC mentioned in design and everywhere in the DPR.
9. Complete design and drawings of all structural components of the bridge including bearing pedestals, seismic arrestors, reaction block, crash barrier etc., shall be enclosed. Design shall be done using Limit state method.
10. In some cases, the Standard Design & Drawings of MoRTH is attached with the DPRs. These drawings are based on IRC21:1966 or IRC21:2000 using Working State Method. Also, at many places, IRC:6:2010 & IRC:6:2014 are referred. After the publication of IRC 112-2011 Code for the Design of RCC and PSC Bridge, IRC 21 is withdrawn by IRC, hence the design and drawings as per IRC:21 are not valid. In the old design based on IRC 21, the Depth of Girders taken is very high resulting in misuse of materials viz. concrete as well as steel, resulting in high cost of the bridge. In view of this, the design and drawing using all provisions of IRC 112-2011 & IRC 6-2017 and other latest codes shall be made using proven bridge design software. Modelling of structure and all assumptions shall be clearly appended/ mentioned in the DPR.
11. The design of Deck Slab is not found attached with some of the DPRs. It must be done separately and appended.
12. In some of the DPRs, designs and drawings of bearings and expansion joints are found missing. Selection of any particular type of bearing (based on the type of superstructure, support conditions, loads transferred from superstructure, etc.), Jacking Pads, Expansion Joints, Railing, Wearing Coat and other Appurtenances shall be done judiciously duly following the relevant codes. The design and drawings of these items shall be done as per relevant codes and included in the DPR.
13. In some cases, Pot-PTFE bearings are proposed in design and drawings. As per code and MoRTH guidelines, elastomeric bearings should be used for minor bridges. These, elastomeric bearings should be designed using the latest IRC 83-2018, Section IX, Part II, for the loads, transferred from the superstructure.
14. Steps involved in installation of bearings especially PoT-PTFE should be given in the drawings. Positioning of the hydraulic jacks with load capacity should be shown in drawings for the replacement of bearings.

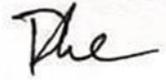
15. For ULS, the value of  $E_{cm}$  shall be taken from Table 6.5, IRC 112-2011. However, before selecting  $E_{cm}$  from Table 6.5, selection of the type of aggregate to be used for the construction is essential as  $E_{cm}$  depends upon the type of aggregate too (Notes under Table 6.5). For SLS, the value of  $E_{cm}$  shall be modified as suggested in IRC 112-2011, cl. 6.4.2.5. However, this was not followed in some of the DPRs.
16. The Seismic Zone of the location of the bridge has not been mentioned in DPR. If the location of the proposed bridge is in Zone III or more, ductile detailing should be designed as per relevant codes i.e. IRC: SP:114:2018 and shown in drawings.
17. In some of the DPRs, the span length of the selected type of superstructure is either more or less than the range in which a particular type of superstructure is economical. The particular type of superstructure shall be selected, based on the site condition, aesthetics, ease in construction, the economy in construction cost, etc. Long span bridges are generally found economical and shall be adopted in lieu of small span bridges. Reasons for selecting the particular type of superstructure shall be recorded in the DPR.
18. Pre-cast culverts and high-level bridge (RCC Solid Slab for < 15 m spans, RCC T Beam Slab for 15 m to 20 m spans, and PSC Girder with RCC Slab for > 20 m Spans) or any other innovative bridge-type viz. voided slab, continuous bridges, etc. should be preferred based on detailed design and economy in consideration.
19. Due attentions should be given while selecting bridge carriageway width as 2-lane or intermediate lane considering the expected traffic growth in future as the bridges are designed for 100 years service life.
20. Bailey bridges are mostly being used in Hilly areas. In some of the DPRs, details are not given about their design, drawings, the basis for a cost estimate, etc. Certified design, drawings, and copies of approved rates for Bailey bridge shall be included.
21. In some of the DPRs, the recommendation given by STA has not been incorporated. These recommendations shall be duly addressed and incorporated in the DPR.
22. The Schedule of rates, used in the cost estimation is not given in some of the DPRs. Copy of Schedule of rates, used in the cost estimation and approved rate analysis of all non-scheduled items shall be included in the DPR.
23. Authentic details of quarry for various construction materials shall be given and distance between the quarry and construction site shall be shown in the maps which shall be certified by the Engineer-in-Charge.
24. Adopted grade of Concrete/steel shall be at least equal to minimum grades of these materials, specified in the relevant codes.
25. In some of the DPRs, there are mismatch in the details given in the report, design and drawings. Even different grade of Concrete is taken in Cost estimate then considered during structural design / mentioned in the drawings. Hence, a system of proper checking of DPR shall be established at the initiation stage itself so that such types of mistakes did not occur.
26. Uses of waste material such as fly ash/plastic are not being used. The use of fly ash will not only save precious topsoil but also utilize the waste products of thermal power plants. For the construction of bridge approach embankments, it is advised to use fly ash as per clause 306 of 'MORD Specifications for Rural Roads'. Similarly, the possibility of the use of plastic and other waste material shall be explored.

27. In the title of some of the DPRs, the Phrase "Major Bridge" has been used for bridges of length less than 60m. The proper nomenclature of the bridge shall be used in the title of the DPR.
28. In some of the DPRs, following are the observations on the drawings: a) print not clear, b) font size very small, c) RD/chainage not mentioned in GAD, d) missing details about grades of various materials used / clear cover to steel reinforcement / details of welds in steel structures, etc., e) Unsigned drawings. Drawings should have good readability and signed by concerned officials; all the relevant details such as grades of various materials, clear cover to steel reinforcement, details of welds in steel structures, safe bearing capacity, etc.; and RD/chainage of the bridge in GAD. All drawings and NOTES therein shall be properly drawn, checked, and duly signed by the DPR Consultant and departmental officers.
29. In some of the DPRs, Formats and Drawings are not found signed and certified. All the Formats and Drawings shall be signed and certified by PIU officials. In some of the DPRs, there is a mismatch in the details given in the report, design, and drawings.
30. In design, Fe415 has been used. Use Fe500 as Fe415 is no more available.
31. In many places, more quantity of steel is provided than the required. This should be avoided.
32. River Training Works viz. protection works, apron with curtain /cut off wall with necessary pressure relief holes need to be provided with proper design as per IRC: 89:2019, IRC:5:2015, and IRC SP:13:2004.
33. Clear Covers for various components of the Bridge are not mentioned anywhere in the Drawings. Further, details in the NOTES should have related to that particular drawing.
34. Details of Cut off Walls and Pressure Relief Holes in the Raft Foundation required to be shown as per Article 21 "Raft Foundation" given on pp. 81 & 82 of IRC SP 13-2004.
35. Design of Dirt wall, Return Wall, Seismic Restrainers/Blocks/ Jacking pads, bearing pedestals, Crash Barriers, Expansion Joints (including mandatory post-installation tests) is required to be conducted by the Contractor, as per the guidelines of MoRTH).
36. Provision of Acceptance load testing of one span of bridge as per IRC :SP:51-2015 and other relevant codes shall be made before opening to traffic.
37. Many mandatory Proformas are incomplete and not signed by the Competent Departmental Officials and STA. These formats are required to be filled and duly signed.
38. In some cases, Joint Inspection of bridge site by STA & SE or CE & CE is not conducted before preparation of DPRs. The details indicated in the inspection format do not match with the relevant details in the DPRs. This needs to be checked and corrected.
39. Environmental Impact Assessment on the selected alignment should be carried out as per the guidelines of the Ministry of Environment & Forests.
40. Unforeseen items considered in General Abstract are not permissible by NRIDA.

Due to negligence in considering proper hydraulic data, rainfall data, catchment area calculation, incorrect design, and improper design of bearings etc during the preparation of DPRs, sometimes result in the failure of the bridges. Such incidence not only puts a question mark on the quality of infrastructure projects being built under PMGSY/ RCPLWE but also does many irreversible losses to society. I would, therefore request you to kindly review/ scrutinize the bridge DPRs in light of the MoRD specifications and relevant IRC codes/guidelines, and these observations may be communicated to the field level officers/ DPR consultants and pass necessary direction to ensure that these observations should not be repeated in future. Further, PTAs/ STAs are requested to provide suggestions/ comments on what corrective system to be imposed to remove these deficiencies in future phases. I solicit your cooperation in this regard.

**With kind regards,**

**Yours sincerely,**



**(B.C. Pradhan)**

**To,**

All the Chief Executive Officers / Engineer-in-Chief/ Chief Engineers of SRRDAs  
All Engineer-in-Chief/ Chief Engineers dealing with RCPLWE Projects in Andhra Pradesh, Bihar, Chhattisgarh, Madhya Pradesh, Maharashtra, Jharkhand, Odisha, West Bengal and Telangana  
All Coordinators, Principal Technical Agencies (PTAs) / State Technical Agencies (STAs) of all the States

Copy to Office of JS (RC) & DG, NRIDA for kind information, please.