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No. RW/33037/1/87/NH(Std.) *Dated the 23rd September, 1987*

To

1. The Chief Engineers of States and Union Territories, Public Works Departments dealing with National Highways and other Centrally Financed Schemes.
2. The Director General (Works), Central PWD.
3. The Director General Border Roads.

Subject : Inspection of bridges on National Highways — Proforma for detailed Bridge Inspection Reports

Please find herewith enclosed a proforma for presentation of the Bridge Inspection Reports together with necessary instructions for completing the same.

2. It is requested that all reports of inspection of bridges on National Highways, carried out in accordance with IRC Special Publication 18 — Manual for Highway Bridge Maintenance Inspection, may please be furnished in the said proforma henceforth.

Enclosure to letter No. RW/33037/1/87/NH(Std.) dt. 23.9.87.

INSTRUCTIONS FOR PREPARATION OF BRIDGE INSPECTION REPORT

I. Cover Sheet

The cover sheet shall contain the following informations :

(a) A Title stating that it is a bridge inspection report

(b) Date of the inspection.
This shall be the last date on which the actual field inspection was carried out

(c) Bridge Number

(d) Local name of the bridge

(e) Feature crossed (Name of Stream etc.)

(f) Location

(g) NH No.

(h) PWD Division and Name of State

(i) Average Daily Traffic and Year

(j) Length of bridge

(k) Name and signature of person under whose supervision the inspection report was prepared.

II. The top of each subsequent page of the Inspection Report will have the following format :

Bridge Inspection Report Sheet _____ of _____

Bridge No.
Name of the bridge
Location and NH No.
Name of PWD Division and State
Inspected by

III. General Sketches

(a) Elevation sketch of structure — This should be a diagram of the elevation view of the entire bridge showing the relationship of one span to another. This is very helpful in determining the overall picture of the structure. Sufficient information should be included so that the orientation

of the bridge could be made such as direction to a local town, route, etc. and whether the view of the structure is looking upstream or downstream.

(b) Cross section view through roadway — A sketch of the superstructure cross section taken through the roadway should be included for each typical section. Important dimensions such as roadway/width, kerb, footpath and parapet/railing dimensions, beam spacing, etc. should be shown.

IV. Structure conditions may be reported against the specific points noted in the proforma. The reporting will require a considerable judgement on the part of the inspector. It should be so written that another person can clearly understand the condition of the structure and at any time in the future, determine if any changes have occurred. Comments must be carefully referer ed as to the location so that there will be no mistake in locating the area of the structure in question.

Reports should be made on individual member like pier P1, P2, ... Calcutta side approach, Madras side approach, Abutment A_1, A_2 etc. A sketch of the member should be enclosed as far as possible. Invariably, any distress condition observed in the structure should be photographed. Such photographs should he suitably referenced, as viewed from u/s, looking towards Calcutta side Span No. 4, etc.

V. **Summary and improvement recommendations**

In para 21 of the proforma, a statement on the general overall condition of the structure, a general summary of the most significant deficiencies found (listed in priority of importance), and any general recommendations for maintenance should he given. All recommendations should either be self explanatory or explained so as to give the reader a feeling for the extent of the deficiency and the urgency of the recommendations. If an interim inspection is felt necessary, then it should be recommended.

Bridge Inspection Report
Sheet 1 of _____

Bridge No. _____
(Local Name) Bridge
Over _____ river
NH No. _____
Location Km. _____ of
Section _____
_____ Division
_____ State
(Average Daily Traffic _____ PCU/(Year)
Length of bridge _____ m.

BRIDGE INSPECTION REPORT
(DETAILED INSPECTION)

Date of Inspection _____
Prepared by Shri _____
Designation _____
_____ Division
PWD.

_____ (State)

Bridge Inspection Report Sheet 2 of _____

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20. Signboards
21. Aesthetics
22. Position of recommendations of previous inspection
23. Summary and improvement recommendations.

Bridge Inspection Report Sheet 3 of _____

Bridge No. _____
Bridge over _____ river in km _____
of _____ Section on N.H. _____ in _____ (State)

Date _____
Inspected by _____

(PROFORMA FOR INSPECTION REPORT)

1. **General**

Give statements on each of the following points :

(a) Dates of inspection and names of Officers conducting inspection on each day

(b) What part of the structure was covered in the inspection

(c) How was the inspection made, e.g. visual observations or aided by some instruments etc. Procedure adopted for approaching and inspecting different parts should be elaborated. Use of special equipment should be mentioned.

(d) Any constraints

2. **Description of bridge**

Describe the bridge structure including the following :

(a) Identify general type of superstructure, substructure and foundation units

(b) Number of spans

(c) Length of each span

(d) Total length of structure

(e) Roadway width

(f) Type of wearing surface

(g) Number and widths of footpaths

(h) Type of railing

(i) Approach roadway

(j) Approximate date of actual construction and extent of any major rehabilitation done (alongwith cost) subsequent to original construction.

3. **General Sketches (mention details enclosed)**

4. **Last inspection**

If previously inspected, the results of the most recent inspection along with the date should be given.

5. **Approaches**

5.1 Condition of pavement surface (Report unevenness settlement, racking, pot-holes etc.).

5.2 Side slopes (report pitched or unpitched, condition of pitching/turfing any signs of slope failure, etc.).

5.3 Erosion of embankment by rain cuts or any other damage to embankment.

5.4 Approach slab (report settlement, cracks movement, etc.).

5.5 Approach geometrics (report whether it satisfies the standards as in force, specially for sight distance, curve radius etc.).

6. **Protective Works**

6.1 Type (mention whether guidebund or protection around abutments or spurs)

6.2* Report damage of the layout, cross-section profile (check whether the layout and the cross-section are in order)

6.3 Report condition of slope pitching, apron and toe walls indicating the nature of damage if any (check for proper slope, thickness of pitching in the slopes, width and thickness of apron, erosion of toe walls, etc.).

6.4 Report condition of floor protection works, indicate nature of damage if any, (condition of impervious floor, flexible apron, curtain walls, etc.).

6.5 Extent of scour (report any abnormal scour)

6.6* Reserve stone material (check against specified quantity)

7. **Waterway (Give sketch showing approximate cross section of the river at the time of inspection).**

7.1 Report presence of obstruction, undergrowth, etc.

7.2* Report maximum observed scour and location and compare with the design values.

7.3 Report any abnormal change in flow pattern.

7.4 Report maximum flood level observed during the year and mark the same on the pier/abutment both on the U/S and D/S.

7.5 Report abnormal afflux, if any.

7.6 Report adequacy of waterway, and clearances.

7.7 Report encroachment, if any.

8. **Foundations**

8.1 Report settlement or tilting, if any.

8.2 Report cracking, disintegration, decay, erosion, cavitation, etc.

8.3 Report damage due to impact of floating bodies, boulders, etc.

8.4 For sub-ways report seepage, if any. damage to the foundations, etc.

9. **Substructure (piers, abutments, wing walls, returns, pier caps and abutment caps)**

9.1 Report efficiency of drainage of the backfill behind abutments (check functioning of weep holes, evidence of moisture on abutment faces, etc.).

9.2 Report tilting, cracking, disintegration, decay, etc.

9.3 For sub-ways report condition of side retaining walls like cracking, disintegration, etc., and see page, if any.

10. **Bearings**

10.1 Metallic bearings

10.1.1 Report general condition (check rusting, cleanliness, ceasing of plates)

10.1.2* Functioning (report excessive movement tilting, jumping off guides).

10.1.3 Creasing/oil bath (report date of last greasing/oil bath and whether to be redone or not).

10.1.4 Report cracks in supporting member (abutment cap, pier cap, pedestal).

10.1.5 Report effectiveness of anchor bolts (Check whether they are in position and tight).

10.2 Elastomeric bearings.

10.2.1 Report condition of pads (oxidation, creep, flattening, bulging, splitting).

10.2.2 Report general cleanliness.

10.3 Concrete bearings.

10.3.1 Report any signs of distress (cracking, spalling, disintegrating & photographs for distressed portion).

10.3.2 Report any excessive tilting.

11. **Superstructure**

11.1 Reinforced concrete and prestressed concrete members.

11.1.1 Report discolouration, disintegration or honey combing etc.

11.1.2 Report cracking and/or spalling (pattern, location, estimation of width and depth, explain preferably by plotting on sketch and photographs).

11.1.3 Report corrosion of reinforcements, if any.

11.1.4 Report damages, if any, due to moving vehicles.

11.1.5* Report condition of articulation (cracks, and/or spalling, if any).

11.1.6* Report perceptible vibrations if any.

11.1.7* Report excessive deflections or loss of camber if any (measure at same point each time).

11.1.8* Report cracks in end anchorage zone (for prestressed concrete members).

11.1.9* Report deflection at central hinge, tip of cantilever for cantilever bridges.

11.2 Steel members.

11.2.1 Report condition of paint.

11.2.2 Report corrosion if any.

11.2.3* Report perceptible vibrations, if any.

11.2.4* Report on alignment of members.

11.2.5 Report condition of connection (adequacy, looseness of rivets, bolts or worn out welds, report specially on connection of stringers to cross girders, cross girders to main girders, gussets or splices, etc.).

11.2.6 Report camber and deflection.

11.2.7 Report buckling, if any.

11.2.8 Report on the cleanliness of members and joint (check choking of drainage holes provided if the bottom booms).

11.2.9 Report loss of sections, if any (give sketch to show such locations).

11.3 Masonry arches.

11.3.1 Report condition of joints mortar, pointing, masonry, etc.

11.3.2 Profile report flattening by observing rise of the arch at centre and quarter points.

11.3.3 Report cracks, if any (indicate location, pattern, extent, depth, explain by sketches).

11.3.4 Check drainage of spandrel fillings (report bulging of spandrel walls if any).

11.3.5 Check growth of vegetation.

11.4 Timber members.

11.4.1 Report condition of paint.

11.4.2 Check decay, wear and tear, structural defects needing immediate replacement, if any.

11.4.3 Report condition of joints, splices, spikes, etc.

11.4.4 Report excessive sag, if any.

11.5* Suspension bridges.

11.5.1* Report condition of cables.

11.5.2* Report condition of suspenders and their connectors.

11.5.3* Report condition of structural steel.

11.5.4* Report condition of painting.

11.5.5* Report excessive oscillations if any requiring need of guy ropes.

11.5.6* Report looseness of joints, bolts, rivets, welds.

11.5.7* Report condition of anchors (evidence if movement).

11.5.8* Report condition of towers and saddles verticality lateral support.

12. Expansion joints

12.1 Functioning (Report cracks in the deck adjacent to the joints and the alignments of expansion joints. Measure expansion raps and record the temperature at the time of such measurement).

12.2 Report condition of sealing material (for neoprene sealing material, check for splitting, oxidation, creep, flattening, bulging and for bitumen filler, check for hardening, cracking, etc.).

12.3 Report secureness of the joints.

12.4* Top sliding plate (report corrosion, damage to welds, etc.).

12.5* Locking of joints (report locking of joints especially for finger type expansion joints).

12.6 Check for debris in open joints.

12.7 Report rattling, if any.

13. Wearing Coat (concrete/bitumen)

13.1 Report surface condition (cracks, spalling, disintegration, pot-holes etc.).

13.2 Report evidence of wear (tell-tale rings, check for thickness as against original thickness, exposed reinforcements, etc.).

14. Drainage spouts

14.1 Check clogging, deterioration and damage, if any.

14.2 Check the projection of the spout on the underside (see whether structural members are being affected).

14.3 Report adequacy, thereof.

14.4 For sub-ways report about adequacy of pumping arrangements, etc.

15. Sandrails

15.1 Report general condition (check uniformity of expansion gaps, missing parts, if any etc.).

15.2 Report rust stains, cracks and spalling, sealing and deterioration of concrete etc.

15.3 Report damages due to collision.

15.4 Check alignment (report any abruptness in profile).

16. **Footpaths**

16.1 Report general condition (damage due to mounting of vehicles).

16.2 Report missing footpath slabs.

17. **Utilities**

17.1 Report leakage of water and sewage pipes.

17.2 Report any damage by telephone and electric cables.

17.3 Report condition of lighting facilities.

17.4 Report damages due to any other utilities.

18. **Signboards**

18.1 Report any signboards missing and any improvement necessary for the existing signboards.

19. **Aesthetics**

19.1 Report any visual intrusion (Bill-boards, paints on structural members, etc.)

20. Report whether recommendations during last inspection has been attended to. (give details).

21. Summary and improvement recommendations :

Sl. No.	Item needing attention	Action recommended	Time when to be completed	Remarks

22. Certificate to be accorded by the Inspecting Official.

Certified that I have personally inspected this bridge.

Date :

Signature
Designation of the Inspecting Officer

Note : Items marked * need not be filled up for minor bridges.