



भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(पोत परिवहन, सड़क परिवहन और राजमार्ग मंत्रालय)
National Highways Authority of India

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23 April, 2008
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POLICY MATTERS: TECHNICAL (11 /2008)
(Decision taken on PQ division file No. 11018/10/2008/PQ)

Sub: Common deficiencies noted in the quality system during inspections of NHDP Works.

Quality systems being implemented in the on going NHDP works have been inspected by the team of senior officers from NHAI headquarters. During these inspections, some of the common deficiencies noted are indicated below: -

1. Review of DPR designs and BOQ provisions:

In number of cases Project Supervision Consultant were found to have limited DPR review to BOQ review only and no review was carried out for the DPR designs. In EPC contracts PSC is supposed to carry out timely review of DPR design and BOQ to enable timely corrective action.

2. Quality Assurance Plan:

2.1 Quality Assurance Manual: Despite, NHAI having issued standard Quality Assurance Manual during July, 2006, in large number of cases it was noted that the QAM prepared did not even mention the organizational structure for Quality Assurance and duties and responsibilities of the quality assurance team. The QAM prepared were also found to have missed out sampling and testing procedures, frequency of mandatory tests, and use of standard formats for recording, test observation and results, reference BIS and IRC codes, ordering special tests on material/completed works, check lists for construction, flagging and removal of non-confirming materials etc.

2.2 Project Supervision Manual: In some of the cases, the Project Supervision Manual did not even contain duties and responsibilities assigned to key persons like Team Leader and team members.

2.3 Method Statement: Method Statements for various items of work are being prepared and approved as and when the work is taken up. These piece-meal approvals are neither numbered nor interlinked to form a comprehensive document. Thus, the component of planning appears missing.

2.4 Implementation of QAM:

2.4.1 Inadequate deployment of key personnel: In some of the cases despite works having been in progress for a long time, the Project Supervision Consultants had not fully mobilized and deployed the key persons required for proper supervision.

2.4.2 In some of the works quality check/cross check procedures in actual practice were found to be at variance in comparison to the procedure prescribed in the QAM.

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2.4.3 Labeling, storage and flagging of the approved samples of material: Labeling and preservation of approved material samples for subsequent comparison and reference and flagging of rejected materials for removal from site is not in practice in many of the projects.

2.4.4 In number of cases the Project Supervision Consultants / Independent Consultant despite contract provisions did not set up their independent testing laboratory for cross checking the routine tests being carried out in the construction agency's laboratory.

2.4.5 Testing of materials etc. from independent outside labs. In some of the cases it was noticed that the samples for testing in the independent outside laboratory were being sent by the construction agency and the test results were also received by the construction agency. The construction agency then forwarded the test result to the PSC. This practice is not as per the TOR of the PSC.

2.4.6 In some cases calibration & testing of plants and equipments, was found to have been carried out using non-standard procedure/practice and frequency. Maintenance of calibration plan and records of calibration were also found to be wanting.

2.5 In-house Quality Audit and management systems review by PSC/Construction agency.

Except in case of ISO 9001:2000 certified companies neither PSCs nor civil construction agencies are carrying out any in-house Internal Quality Audit and management systems review to ascertain effectiveness of the quality systems implementation at regular intervals to improve the Quality Assurance System.

2.6 Test Checks:

Mandatory Test Checks by the Team Leader, RE and PD could not be substantiated in many cases as the Consultants are not maintaining proper account/record of the test checks done by them and the PD. Some of the PDs were found to be avoiding carrying out test checks of the works and Q.C. procedures stating pre-occupation with other responsibilities assigned to them. In these locations the IPCs were also not accompanied with Test Check Statement and certificate of the consultants indicating mandatory test checks having been carried out.

2.7 Request for Inspection:

2.7.1 Approval/rejection of work is done through "Request for Inspection" document. In number of cases computer logging of RFI's, methodology to watch the final disposal of rejected RFI's, methodology and system for resolving non-conformities were not found in place. Cross linking of rejected RFI's with a new RFI's through which the corresponding rejected work is accepted was also not found. Non existence of such procedures may result in acceptance of rejected layer and subsequent covering with upper layer.

2.7.2 Check lists for checking of important items of work should invariably be accompanied with RFI's to indicate component of work checked by the construction agency's representative and cross-checked by the Supervision Consultant's representative. In number of works, it was noted that RFI's were not containing the check lists.

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2.8 Form work and Staging:

Form work and staging for the structures are required to be properly designed and erected to support the load of structure during construction and till the structure attains strength. In number of cases, it was noticed that form work included deformed shuttering plates and the supporting staging was not properly braced and supported on the ground. Such negligent approach has already resulted in failure of staging during/ immediately after construction in some locations. PSC and PD should ensure that deformed shuttering plates are not allowed/used and the joints between the shuttering plates and other members are properly sealed and staging is properly designed and cross braced to support horizontal and vertical loads during and after construction.

2.9 Defective concrete work in structures:

To ensure long-term durability of concrete structure, it is essential to ensure that the reinforcing bars are having adequate cover and provided with proper laps and concrete surface is not porous. During inspections it was noted that at number of places there were: -

- Inadequate cover to reinforcing steel.
- Leakage of cement slurry through construction joints due to improper sealing of joints.
- Tie bars, for verticals shuttering, were provided without sleeves, which got embedded in the concrete making surrounding concrete reinforcement vulnerable to corrosion.
- Not writing casting dates at prominent locations to ensure proper curing of the concrete
- Use of old and deformed shuttering plates resulting in uneven and deformed surface finish.

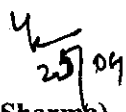
2.10 Maintenance of existing road and road safety:

2.10.1 Maintenance of existing carriageway: Existing roads are not being maintained in traffic worthy conditions.

2.10.2 Road safety: In many projects due attention is not being paid for road safety measures and installation of retro reflective cautionary and directional signage.

3. Project Directors of NHAI play an important role for effective administration and implementation of the projects. Their duties and responsibilities have already been defined in the Policy Circular No.11041/21/2002-Admn. dated 18.04.06. Project Directors are accordingly advised to issue copy of this circular to all the Project Supervision Consultants and Independent Engineers working in their jurisdiction and also ensure that efforts are made to ensure that above mentioned defects are not repeated in the works under their jurisdiction.

This issues with the approval of Chairman.


(V K Sharma)
General Manager (Admn)

To :

PS to Chairman
PS to all Members
All CGMs/CVO
All GMs /DGMs
All PIUs/CMUs/SPVs

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