

A large crowd of people is gathered on a riverbank, with many small boats on the water. The scene is festive, with people on the boats and on the shore. The background shows trees and buildings under a clear sky.

Chapter 8

QUALITY ASSURANCE

Quality Assurance

Quality assurance is essential for creating physical infrastructure and provisioning of goods and services. This chapter brings out issues relating to assuring quality through regular prescribed site testing, lab testing and third party inspections of construction works.

8.1 Road works

The existing orders provide that construction works should be executed as per prescribed specifications with required quality so that the executed works serve the purpose for their designed life. For ensuring required quality during the execution of works in zones/circles/divisions, respective Zonal Chief Engineers, Superintending Engineers and Executive Engineers were responsible. IRC prescribed for conducting several quality tests for both bituminous and non-bituminous items of road works. It was prescribed in the conditions of the contract also, that the contractors would provide on-site testing facility for materials used during construction and would conduct prescribed tests at the prescribed frequency. In addition to on-site testing by contractors, divisions were also to conduct tests in district labs.

Scrutiny of the records of PWD divisions, however, revealed that neither the contractors conducted prescribed on-site tests nor the prescribed tests were conducted by the divisions in the district labs.

Following major points related to deficiencies in quality control by PWD were noticed:

8.1.1 Deficiencies in on-site testing

Contract bonds provided for establishment of laboratory at work site by the contractors for testing of materials used during construction as per IRC norms. Contractors had to evidence the quality tests conducted at work site. Scrutiny of the records of five divisions¹, however, revealed that none of the contractors established laboratories at the work sites. Hence, the prescribed tests at the work-sites were not conducted. Thus, the quality of materials used in construction works was not ensured.

CE, PWD, Allahabad during physical inspection of roads found (May 2012) that test registers were not available at work sites for entering the test reports and ordered to open these registers. However, divisions did not furnish the on-site test registers to audit.

The General Secretary of Diploma Engineer Sangh, PWD, Allahabad also informed (June 2012) SE, Allahabad-Kaushambi Circle, Allahabad that technical staff, machinery and labs, as required by Model Bidding Document (MBD), were not available with the contractors.

¹PD, CD-1, 2, 3 and 4.

Thus, the prescribed on-site testing was not conducted by any contractor engaged in MKM works, thereby not ensuring the efficacy of quality of materials used.

The State Government did not furnish specific reply and stated (November 2013) that quality tests were carried out by MNNIT and test reports revealed that quality of works was satisfactory. The fact remains that the prescribed quality tests were not conducted by MNNIT as mentioned in paragraph 8.1.4.

8.1.2 Shortcomings in quality tests by departmental laboratory

As five divisions of PWD were executing MKM road works; CE, PWD, Allahabad instructed (February 2012) all EEs to get the materials tested from departmental lab under the jurisdiction of CD-2, PWD, Allahabad and send weekly test reports to his office.

Scrutiny of the records of departmental laboratory under the jurisdiction of CD-2, pertaining to the testing of samples sent to departmental laboratory by these divisions, revealed that the prescribed tests of non-bituminous and bituminous works were not conducted. We observed:

1. Out of total 111 road works sanctioned for MKM, samples of non-bituminous works from only 22 roads (20 per cent) were sent to this lab. Further, all the five type of tests required to be conducted in the lab, were not conducted in the case of even these 22 road works as given below:

Table-1: Details of tests conducted in departmental lab

Particular	Aggregate impact value	Water Absorption of Aggregate	Flakiness Index of Aggregate	Sieve Analysis of Aggregate	Plasticity Index
(1)	(2)	(3)	(4)	(5)	(6)
Number of tests conducted	22	18	2	12	3

(Source: Information provided by CD-2, PWD)

2. As regards bituminous works, only bitumen content test was conducted. Samples of only three roads were sent for testing bitumen content for Bituminous Macadam (BM) while no samples were sent for Semi Dense Bituminous Concrete (SDBC).
3. The frequency of samples for tests was not as per IRC. Of the three roads, the samples of which were sent to the lab, only two samples from a road² against required 21 samples and one sample each from other two³ roads against required 5 samples each were sent. Thus, the norms of IRC for number and frequency of testing were not adhered to.

Further, CE wrote⁴ to all the divisions repeatedly that required test reports were not being sent to his office, as directed by him. CE also directed (May 2012) that if test reports are not furnished, name(s) of the Junior and Assistant Engineers concerned will be forwarded for necessary disciplinary action.

²Phaphamau-Sahson-Hanumanganj road (Quantity: 3,629 cum).

³Old GT road to Nagvasuki Mandir road and Old GT road to Triveni road and Hanuman Mandir Road.

⁴ 18 February 2012; 5 and 27 March 2012; 10 April 2012; 11, 19 and 25 May 2012; and 3 June 2012.

However, CE was not furnished the names of Junior and Assistant Engineers and no action was taken against the concerned engineers.

A laboratory under the jurisdiction of Provincial Division (PD) did exist, but the samples from only one⁵ out of 29 roads constructed by PD, were sent to this lab for testing, rendering the testing facility at the lab⁶ largely unutilized.

The State Government did not furnish reply (March 2014). However, EE, PD accepted (August 2013) the facts and stated that tests were carried out at sites.

8.1.3 Insufficient sampling/incomplete progress reports

The Government prescribed (August 1996) that sample(s) from every estimate of road works shall be collected and sent to Quality Promotion Cell (25 per cent), regional labs (25 per cent) and district labs (50 per cent) for testing. Scrutiny of the records of five PWD divisions revealed that no samples of road works were sent to Quality Promotion Cell. Samples of only 46 roads were sent to the district lab under the jurisdiction of CD-2, PWD Allahabad.

Divisions were also instructed to mention the position of samples tested in their monthly progress reports. Moreover, in contravention to these instructions, divisions did not mention the detailed tests conducted, number of samples tested and test reports in their monthly progress report.

The State Government did not furnish reply (March 2014).

8.1.4 Incomplete Third Party Inspection by MNNIT

Execution of MKM works started in December 2011 but the State Government ordered only on 09 July, 2012 that MNNIT would conduct third party inspection of all MKM works being executed by various departments/agencies to ensure the quality of works. However, the State Government order was not specific and did not mention details like sampling technique, frequency of tests, items of works to be tested (bituminous or non-bituminous) etc. Further, due to delay in entrusting the work of third party inspection to MNNIT (after seven months of the start of MKM works), samples from only 53 out of total 111 roads were taken. Scrutiny of the test reports revealed the following:

- MNNIT conducted quality tests of only bituminous works (BM & SDBC) and not for non-bituminous⁷ items of works;
- Even for bituminous works, all the prescribed tests as per IRC specifications were not conducted. Only the content of bitumen and crust thickness of bituminous works was tested. Testing of crust thickness was not prescribed by IRC. Without conducting test for density of compacted thickness required under IRC, testing of only crust thickness of a road was meaningless; and

⁵ Rewa road to Mirzapur road via Omaxe city, DPS and old Yamuna Bridge.

⁶ One lab assistant posted, recurring expenditure sanctioned: ₹ 30,000 per annum.

⁷ Granular Sub Base, Water Bound Macadam and Wet Mix Macadam.

- Frequency of taking samples for tests was also not as per IRC norms. We observed shortfalls in frequency of taking samples, which ranged between three and 85 per cent and one to 99 per cent in cases of BM and SDBC respectively.

The quality test to be conducted by MNNIT was not adequate.

The State Government did not furnish reply (March 2014). However, MA only stated (June 2013) that MNNIT was entrusted the work of checking of all works.

8.1.5 Damage of executed works

Physical inspection of 15 road works (July-August 2013), constructed during MKM, revealed that four roads were not in proper condition and there were pot holes and depressions on these roads. Pavement Blocks laid on foot paths were also damaged. This reflected the poor quality of executed works.



Damaged road-DPS-Omaxe city to Mirzapur road, 01.07.2013.



DPS-Omaxe city to Mirzapur road, 01.07.2013.



Damaged road-Anand Bhavan road, 01.07.2013.



Damaged road-Rewa road, Dandi market, 01.07.2013.

No reply was furnished by the Government (March 2014).

8.2 Recommendations

- IRC mandated quality tests and also the norms/Government and E-in-C orders/conditions of contract should be strictly adhered to by all works executing agencies; and
- In case, testing is to be done by a third party, the type, number and frequency of tests should be specified in the Government order/Terms of Reference itself as per standards (e.g. IRC).