

KARNATAKA RURAL INFRASTRUCTURE DEVELOPMENT LIMITED
(FORMERLY KARNATAKA LAND ARMY CORPORATION LIMITED)
GRAMEENABHIVRUDDHI BHAVANA, 4th & 5th FLOOR, ANAND RAO CIRCLE BANGALORE-9

**Guidelines on Quality Assurance and Control Mechanism
in KRIDL for all works**

1. Introduction
2. Quality Control Registers
3. First tier quality control
4. Second tier Quality Control
5. Third Tier Quality Control
6. Quality Control Laboratories
7. KRIDL SQC & Team @ Head quarters, Bangalore.

1. Introduction:

The Karnataka Rural Infrastructure Development Limited (KRIDL) is implementing various construction works such as BBMP works, BMRCL works, Buildings such as Hostels under Social Welfare Department, Director of Technical Education Department, Director of Collegiate Educational Department, Stadiums under Youth Service Department, Roads, Water Supply works, Electrification, Suvarna Grama Yojana Works of Govt. of Karnataka and other Departments and various development works under Zilla Panchayat and other local bodies.

To ensure good quality in Construction KRIDL works, three tier Quality monitor mechanism is adopted.

KRIDL envisages a three-tier Quality Control & Quality Monitoring mechanism. The first tier shall be with the PIU/Site Engineer in charge of the work. The site Engineer establish Quality Control laboratories/Field laboratories and get the stipulated tests conducted. The test results shall be recorded in the prescribed Quality Control Registers. All the concerned officers shall record their observations in the Quality Control Registers.

The second tier shall comprise periodic inspection by the District Quality Monitor engaged by KRIDL, independent of the PIUs. The second tier comprise of District Quality Monitors appointed by KRIDL for the purpose who shall be retired Executive Engineer from State/Central

organization/Professor/Assistant/Associate Professor/Register Consultants with more than 10 years of experience. These DQM, will carry out periodic inspections of works. The SQC will be responsible for reporting compliance on the issues raised by DQMs.

The third tier shall comprise State Quality Monitors(SQMs) appointed by the RD&PR department for the purpose, who shall be retired Senior Engineers (Superintendent Engineer and above) from State/Central organizations. Central or State Public sector, Professors, Associated professors affiliated to Reputed Engineering Colleges, Registered Technical consultants with minimum qualification of B.E/M.E/M.Tech in Civil Engineering branch with more than 15 years experience in Civil construction.

These SQMs will carry out Quality testing of works on random sampling basis from the prioritizing list, mainly in order to confirm that the programme implementation and District Quality Control System is working satisfactorily. The SQMs are expected to make constructive suggestions relating to procedural aspects in addition to locating problems at individual work level.

The SQC will be responsible for reporting compliance on the issues raised by SQMs.

State quality control co-ordinator(SQC)

The following process may be adopted for State level Quality Monitoring.

There should be a State Quality Control Coordinator (SQC) of the rank of the Superintending Engineer (SE) or Chief Engineer with a team of one Executive Engineer 3 AEE's 3 AE's and computer operator. The functions of the Coordinator should be as follows:

- i. To coordinate and supervise first tier Quality Control arrangement.**
- ii. To coordinate and control the activities of District Quality Monitoring arrangement, and ensure compilation of action on the reports of District Quality Monitors.**
- iii. To facilitate and coordinate the activities of the State Quality Monitoring arrangement and ensure compilation of action on the reports of State Quality Monitors.**
- iv. To prepare monthly abstracts of DQM visits and an Annual Quality Report based on the Reports of DQM's and SQM's and action taken thereon.**

2. Quality Control Registers

Ensuring the Quality of the Buildings, roads and other works is the responsibility of KRIDL Quality Control Registers shall invariably be maintained for each of the works under the Programme. AEs/JEs are responsible for maintaining Quality Control Registers for having conducted required number of quality tests as per manual. The quality control register will be maintained in two parts. The first part will be Quality Control Register - Record of Tests and the second part will be the Record of Abstract of Tests and Non-Conformance Reports.

Register Part-I: The first part of the register is the register of all Quality Control Tests conducted by the person who is responsible for the basic Quality Control Testing. The Quality Control Register will be maintained by concerned site Engineer for every work. **This register will always be available at the work site.** The register will not be taken away from the site in any case. The first part of the register will have following three sections :

For Roads:

Section 1: Earthwork 1/21/2014 Quality Control Guidelines for roads

Section 2: Granular Construction for roads

Section 3: Bituminous construction for roads

or

For Buildings :

Section 1: Foundation, basement and plinth as per quality control guidelines for building.

Section 2: Super structure and roofs and all structural members as per quality control guidelines for building.

Section 3: Finishing works as per quality control guidelines for building.

Register Part-II: The second part of the register is the record of abstract of the tests conducted and Non Conformance reports. It will be maintained by the site in charge officer not below the rank of **Assistant Executive Engineer**.

The QC Register will be issued in the same manner as the Measurement Book is issued to the work.

Every register should be page numbered and no page should be removed. The register of issue of the Quality Control Register will be maintained by the head of the PIU.

The filling of tests formats of Part 1 and Part 2 shall be as per the guidelines of Quality Control Handbook.

3. First Tier Quality Control:

Head of Programme Implementing Unit (PIU) or the Assistant Executive Engineer is responsible for Quality Control of the works under his charge. He is responsible for all mandatory Quality Control tests.

The following process is suggested for the first tier Quality Control

The official responsibility for proper Quality Control Tests is at Programme Implementing Unit level (PIU). The following check mechanism may be prescribed.

- i. All the tests should be conducted by the designated qualified staff of the site i.e., AE/JE and the Quality Control Register Part-I should be maintained by him.
- ii. 20% of the tests should be conducted in the presence of the in-charge AEE of the work and the AEE should record his observations in the Quality Control Register Part-I.
- iii. 5% of the tests should be conducted in the presence of the in-charge Executive Engineer of the work and the EE should record his observations in the Quality Control Register Part-I. The EE will also ensure that the Non-Conformance reports are issued in time and the Engineer takes action in time.
- iv. The Superintending Engineer (SE), during his visits to the work will oversee the Quality Control Tests and record his observation in the Quality Control Register Part-I. The SE will monitor that the non-conformance reports are issued in time and the Engineer incharge takes action in time.
- v. The Chief Engineer (CE), during his visits to the work will review the Quality Control Test Register and records his observation on Quality Control Register Part-I. The CE will also review that the Non-Conformance reports are issued in time and the Engineer incharge takes remedial action in time.

The monthly returns of the tests will be submitted in the prescribed Performa by the Assistant Executive Engineer to the Executive Engineer in the first week of every month. The Executive Engineer will review this returns regularly to see that the Quality Control tests are being performed at the desired frequency and with required accuracy.

4. Second tier Quality Control:

As the second tier of Quality Control structure, periodic inspections of works will be carried out by the District Quality Control Monitors, engaged by KRIDL, independent of the Executive Engineer. This tier of Quality monitoring is very important and has been designed to see that the Executing agency is carrying out the Quality Controls as per specifications.

- a. District Quality Monitors (DQM) should be engaged by KRIDL to oversee the Quality in the implementation of programme Districts. These monitors should be independent of the Executing agency and should report to the State Quality Control Coordinator. Quality Control organizations, agencies or individuals who have experience in Quality Control of road, building works can be engaged for this purpose.
- b. The programme for DQMs should be drawn up in such a way that every **work is inspected at-least two times**. The first inspection of every work should be carried out during the execution of work and the last inspection should be carried out on the completion of every work, within one month of its completion.
- c. The SQC may draw up a monthly Schedule for Monitors (Block/ District wise) so as to ensure systematic coverage. A well-defined system should be formulated to monitor the compliance of the observations of the District Quality Monitor.
- d. The DQM should be given a detailed format for the inspection Report that should cover the following aspects.
 - i. Design of pavement and CD works for roads.
 - ii. Design and details of all Structural members of building.
 - iii. Provisions made in estimates with regard to site requirements .
 - iv. Construction Programme and progress of work.
 - v. Execution methodology and adherence to specifications.
 - vi. Arrangement at Quality Testing Laboratories, if necessary.
 - vii. Record of Tests- Quality Control Registers and their upto date maintenance.
 - viii. Accuracy of Quality Control Tests, issuance of Non Conformance Reports (NCR) and action of Engineer incharge on NCRs.
 - ix. Inspection of departmental officer/DQMs or SQMs and compliance of their instructions.
 - x. Provision and execution of CD works and side drains for roads.
 - xi. Provisions and execution of Water supply works, Sanitation works and ellectrification of buildings.
 - xii. Road furniture, Logo, Signboards and caution boards 1/21/2014 Quality Control Guidelines.

- xiii. Other issues including the technical knowledge of the staff of the executing agency and the Engineer Incharge.
- e. The State Quality Coordinator may send the Monitor's reports to the Project Implementing Unit with a copy to the SE/CE. Compliance reports should be routed to the SQC through the SE/CE. All cases of delay in reporting compliance and major cases of deviation from acceptable Quality should be taken seriously.
- f. The DQMs may hold Meetings with PIUs and Engineers incharge of works, inspect Field/ District Laboratories to ensure smooth functioning of the Quality Control Mechanism.
- g. Each month, the SQC will compile an abstract of the DQM visits giving the District-wise observations and send copies to CE in the prescribed Format.
- h. The State Quality Control Coordinator should prepare and send an Annual Report to Additional Chief Secretary, RD & PR comprising the analysed performance of District Quality Monitoring System.
The analysis should include findings of the DQM reports, SQM reports, action taken in individual cases and systemic deficiencies detected and remedied.

5. Third Tier Quality Control:

The third tier of Quality Monitoring is oriented more **towards verification and review of systems and procedures** being adopted at 1st and 2nd tier of Quality Monitoring, so that it can be ensured that specified requirements for Quality Management are being met.

As the third tier of the Quality Control Structure, the Additional Chief Secretary RD&PR is engaging Independent State Quality Monitors(SQM) mostly retired Senior Engineers with Superintendent Engineers and above rank with State/Central Organizations.

The SQMs are given the letter of request once in two months for carrying out inspection as per the program for the forthcoming two months. The SQM should finalize a suitable program to spend not more than three days in each district inspecting normally between 2 to 4 works on each days (2 works in progress or 1 work in progress and 2 completed works or 4 completed works). The districts as well as blocks where the inspection of works is to be carried out will be indicated in the letter allocating the works. Formats for inspection report of the monitors has been

prescribed and the SQMs are required to submit the copy of the report to PIU, SQC as well as RD&PR.

The SQMs will also hold post inspection discussions with all the engineers in order to review findings of his inspection and to suggest improvements in execution to obtain better Quality for all works under the PIU.

The SQMs are also expected to interact with SQCs.

The State Quality Monitors are required to visit the works and they will evaluate each part of the work for material and workmanship as per the format for Inspection Report of State Quality Monitor, indicating the tests carried out and the test results obtained. A copy of the Inspection Report will be handed over by the SQM to the Head of the DPIU.

The State Quality Monitors will submit all individual work wise Inspection Reports along with a general analysis based on the works inspected by him as well as other inspection reports accessed by him. Since the role of the State Quality Monitors is **guidance and improvement rather than mere 'fault finding'**, the analysis is an extremely important aspect and must be prepared with care, bringing out systemic deficiencies/ shortcomings and suggestions for improvement in

- Design and Estimation
- Execution and Supervision
- Quality Control as per Quality Control Guidelines

The analysis of the Reports of the SQMs is done at KRIDL with an intimation to RD&PR of Government of Karnataka and KRIDL required to take appropriate action on the report of the State Quality Monitors as quickly as possible.


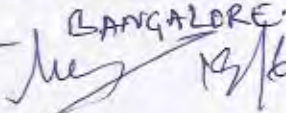
6. Quality Control Laboratories:

The AEEs and EEs are to ensure establishing field quality laboratories with equipments as per the approved lists with a mobile quality control van to ease the process of Quality Monitoring. The services of PRED & PWD District Quality Laboratories and Laboratories of reputed Engineering Colleges/Other Institutions should also be used for higher level of Quality Control Testing. Regular training programme should be organized for the field staff in updating the knowledge of testing procedures & accuracy of results and maintenance of registers.

7. KRIDL SQC & Team @ Head quarters, Bangalore.

The following team will work for the implementation of quality assurance and quality control mechanism at KRIDL, HQRS, Bangalore.

1. Sri. T.H. Gurumurthy, Executive Engineer(Works) - SQC
2. Sri. K. Abdul Raheem, Assistant Executive Engineer(Design & PMC) - Member
3. Sri. B.R. Nagaraj, Assistant Executive Engineer(Works) - Member
4. Sri. C.B. Yogish, Assistant Executive Engineer(Design) - Member
5. Sri. K.N. Krishnamurthy, Assistant Engineer(Works) - Member


CHIEF ENGINEER (S)
KRIDL BANGALORE.

13/6