





90/08

**Roles and responsibilities of construction staff, Quality Control wing and third party Quality Control agency in execution of project taken up under E.P.C Turnkey system.**

The Government of Andhra Pradesh has taken up large number of Major and Medium Irrigation Projects to bring an additional ayacut of about 65 lakhs of acres in a span 2 to 5 years. Most of the projects are grounded and are at various stages of progress. As the projects are to sustain for number of decades, Quality Control assumes an important role. Maintenance of Quality of Irrigation Projects is a continuous process and has to be ensured and assured by the executing agency under EPC system, construction staff, Department Quality Control Staff and the third party Quality Control agencies wherever appointed.

For exercising the quality control check and maintaining proper record at the site of work for offering the remarks to inspecting officers, a study was made.

- a) To define the roles and responsibilities of field staff, quality control staff and 3<sup>rd</sup> party quality control agencies. In this, the essential items shall be identified which must be inspected and cleared by the quality wing and/or 3<sup>rd</sup> party quality control agencies before crucial items of civil and mechanical work like embankments, foundations of large structures, fabrication of steel/PSC pipes, embedding of EM Parts etc to be taken up.
- b) The procedure for recording of work executed in M Books for making payments to the contractors for the work executed every month including maintenance of records and certification of quality of work executed.
- c) Reporting procedure for adverse remarks of 3<sup>rd</sup> party QC agencies to field staff, CEs, Commissioner (Krishna Basin) & Ex-Officio Secretary to Government and Director (Godavari Basin) & Ex-official Additional Secretary to Government and remedial action by field staff and reporting procedure.



(3)

The following guidelines are drafted with reference to the above three aspects and the same may be followed to have a uniform procedure in maintaining the quality control / assurance in the project taken up under EPC turnkey system.

**(A) The roles and responsibilities of field staff, Quality Control staff and 3<sup>rd</sup> party Quality Control Agencies.**

**I) FIELD STAFF**

(1) The field staff (construction staff) has to associate with the EPC agency while conducting the tests. In case of necessity they may conduct tests independently whenever required. Under E.P.C. System the field staff play a vital role in quality assurance of the works.

(2) The field staff shall invariably check and produce all the following Records and O.K. Cards maintained by E.P.C. Agency at the site to the Inspecting Officers.

**A) Registers :-**

- 1) Site order.
- 2) Register of Bench Marks.
- 3) Material O.K. Register.
- 4) Register of foundations.
- 5) Register of placement for concrete, Embankment, Reinforcement and other test reports.
- 6) Register of test reports of compressive strength of concrete specimens.
- 7) Cement day Book.

**B) O.K. Cards for Big Structures and Heavy Embankments :**

- 1) O.K. card for cast-in-situ concrete lining.
- 2) O.K. card for Earthwork Embankment.
- 3) O.K. card for grouting.
- 4) O.K. card for structural concrete work.

(3) The inspecting officers should verify the above records with their observations and sign in the Registers maintained at site during their inspections.



(4) In case of Earthwork excavation embankment, the field staff have to check and record the pre levels 25 % of the pre levels taken by the E.P.C. Agency. In case of cut-off and foundations the field staff have to check and record 100% levels.

**(II) Department Quality Control Staff**

(1) The Department Quality control staff shall verify the records maintained at site by E.P.C. agency and the third party quality control agency. The field quality control staff have to check 25% of the final levels of Earthwork, revetment, lining, concrete, linear dimensions of important structures, gates etc., and record independently.

(2) Regarding the tests and frequency of tests, the field quality control staff have to conduct / associate with construction staff as mentioned in Annexure 'D'. In case of ambiguity, they shall conduct tests in A.P.E.R.L. independently.

(3) Wherever the Third party quality control agency is not appointed, the Department quality control staff have to issue the quality certificates for releasing payment to the E.P.C. agency during construction and after completion.

**(III) Third party Quality Control Agency**

(1) The third party quality control agency should possess all the testing facilities as per agreement and conduct independent testing to assure the quality of work. They should also verify 10% of the tests being done by the E.P.C. agency independently.

(2) The third party quality control agency has to submit the reports and records to the Engineer-in-Charge vide appendix 'E' (enclosed).

(3) The third party quality control agency shall give Quality Control certificate for each work bill executed by the EPC agency.



**B Recording of measurements and certifying payments to the E.P.C Agency**

1. Measurements are to be recorded by the EPC agency in the Measurement Book and L.F. Books.
2. The measurement book and L.F. book are to be issued by the concerned Executive Engineer duly certified and numbered.
3. Field Engineer (A.E./A.E.Es) have to check and record 25% of pre levels and 100 % for final levels.
4. Field Engineer (A.E./A.E.Es) have to check measure 100 % of final measurements.
5. Field Dy. E.Es have to check the measure 25 % of the levels and measurements spread over the entire work.
6. Field E.E/S.Es have to check measure as per codal provisions and rules in vogue.
7. The measurement Books and L.F. books have to be maintained by the E.P.C. agency and finally to be handed over the Department (Engineer-in-Charge).
8. The Department, Q.C. Staff have to check 25 % of the final levels of earth work revetment, lining concrete, linear measurements of important structures.
9. Measurements will be recorded by the EPC agency for the finished work duly certifying that all tests are conducted and work done by the agency in accordance with specifications and contract conditions by using the material specified in the contract.
10. The EPC agency shall prepare monthly work bills based on the recorded measurements of work done and submit to the Engineer-in-Charge duly signed by them or his authorized signature for arranging payment. The agency is eligible for payment of completed portion of the work only as stated below for canal works as per clause 42 of the agreement. For example Package 45 the unit length for eligibility for arranging of payment for earthwork excavation of canals may be taken as 250 m for main canal (discharge between 1000 cusecs and 10,000 cusecs) 1.0 Km for branch canal (discharge between 100 cusecs and 1000 cusecs) 2.0 Km for distributories (discharge between 10 cusecs and 100 cusecs) and 5 Km for minors and sub-minors.



11. In respect of CM and CD works (structures) the intermediate payments will be in three stages i.e. at (a) completion of foundation including earth work (b) completion of sub-structure and (c) completion of super structure including miscellaneous items. The mode of payments will be 30 % after completion of foundation, 30 % after completion of sub-structure and balance 40 % after completion of individual structure.
12. The cost of earthwork excavation and structures (on percentage basis with respect to whole work) mentioned in Schedule "A".
13. Intermediate payments for each structure (in 3 stages) shall be for canals and distributories (up to 10 cusecs discharge) only. For minor and sub-minor (below 10 cusecs discharge) no separate intermediate payments to the structures shall be considered. For minors and sub-minors payment shall be released when earthwork excavation of canal and all structures (CM & CD works) are completed in full shape for a length of 5 Kms.
14. For other work like spillway, earth dam, pressure main, gates etc. the agreement clause for payment shall be followed keeping in view the agreement condition.
15. The Engineer-in-Charge shall recommend for release of payment duly ensuring quality certificate by the third party quality control agency / Department Quality control staff (in absence of third party quality control).

**NOTE:** The above guidelines have to be followed duly inter relating with the relevant conditions/clauses of the respective Agreements concluded.



(C) Reporting procedure for adverse remarks of 3<sup>rd</sup> party quality control agency and departmental quality control staff.

1. Reporting procedure shall be followed as per Appendix 'E'.
2. The third party quality control agency shall submit reports in four sets for specific cases of deficiencies for corrective action to the Engineer-in-Charge soon after verification. The sub-standard material shall be rejected and got them removed from the site. In case of necessity, Engineer-in-Charge shall arrange to stop the work till the deficiencies are rectified to the satisfaction of the 3<sup>rd</sup> party quality control agency / departmental quality staff.
3. The Engineer-in-Charge shall communicate the above remarks of 3<sup>rd</sup> party quality control agency to the EPC agency for compliance of corrective action.
4. The EPC agency shall furnish compliance report to the Engineer-in-Charge, who in turn forward the same to the third party quality control agency / department quality control as the case may be for verification.
5. Soon after receipt of report on the compliance to the remarks of the third party quality control agency by the EPC agency, evidence of compliance of corrective action has to be furnished to the Engineer-in-Charge to proceed with further work.
6. In addition to the above, the observations made by the third party quality control and the Dept., quality control staff have to be invariably complied with before the next bill is present for payment and certificate to that effect has to be recorded in bills presented by the EPC agency duly countersigned by their field construction staff before making payments.
7. Engineer-in-Charge shall conduct meeting with the EPC agency and 3<sup>rd</sup> party quality control agency once in a fortnight to review the adverse remarks, compliance reports, verification reports etc. Any non compliance of the adverse remarks within reasonable time shall be brought to the specific notice of Superintending Engineer, Chief Engineer (HOD) and the concerned Secretary (Projects/Commissioner (Krishna Basin)/Director Godavari Basin.



8. On completion of the works, the third party quality control agency and Department Quality control staff have to certify that the work has been executed as per design and specifications satisfying intended scope of project as indicated in the agreement before making final payments to the E.P.C agency.
9. Mechanical Division shall do all Quality Control Checks of Mechanical works under the control of Mechanical and Work Shop Circle.
10. All Quality Control Units inclusive of 3<sup>rd</sup> party agency shall be under the Technical Control of Engineer-in-Chief (Irrigation).

Sd/-

Engineer-in-Chief (Irrigation)