

**KERALA STATE ELECTRICITY BOARD**



**GUIDELINES TO BE FOLLOWED BY THE  
OFFICERS OF THE BOARD FOR THE  
IMPLEMENTATION OF  
HYDRO ELECTRIC PROJECTS**

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# CONTENTS

Introduction .....	3
1. PRE-EXECUTION STAGE .....	4
1.1 Investigation .....	4
1.1.1 Project Identification .....	4
1.1.3 Preliminary Investigation .....	4
1.1.4 Detailed Investigation .....	4
1.2 Preparation Of DPR .....	5
2. EXECUTION STAGE .....	5
2.1 Clearances .....	5
2.2 Land Acquisition .....	6
2.3 Preparation of Estimate .....	6
2.4 Preparation of Tender documents .....	6
2.5 Pre construction survey .....	7
2.6 Preparation of preliminary drawings for tender purpose .....	7
2.7 Tendering .....	7
2.8 Execution of Work .....	8
2.9 Excavation and stacking of serviceable material .....	8
2.10 Excess quantities .....	9
2.11 Extra items.....	9
2.12 Over excavation.....	9
2.13 Over breakage/ Loose falls.....	10
2.14 Quality Control.....	10
2.15 Mix designs .....	10
2.16 Deviations.....	10
2.17 Construction drawings.....	10
3. POST EXECUTION .....	11
3.1 Completion Report .....	11
3.2 Technical Completion Report .....	11
3.3 Performance observation during defect liability period.....	11
3.4 Release of Security.....	11

# **GUIDELINES TO BE FOLLOWED BY THE OFFICERS OF THE BOARD FOR THE IMPLEMENTATION OF HYDRO ELECTRIC PROJECTS**

## **Introduction**

During the implementation of hydroelectric projects, delays are being faced in different stages due to various reasons. One of the reasons for the delay is non-availability of unambiguous procedures for taking appropriate decisions in each stage during the implementation of Project. This has prevented the officers from taking necessary remedial measures to overcome the bottlenecks and taking appropriate decisions at each stage. If appropriate procedures are followed objectively delays which would arise, from litigation and such other interventions can be avoided.

Hence, formulation of guidelines which are to be followed in the implementation of hydro electric projects has become necessary for streamlining the procedures and for avoiding the unwanted delays and to avoid such situations, which would affect the progress of implementation and causing financial implication to the Board. As such, the following guidelines are issued for strict compliance by the officers and staff for the speedy implementation of the projects.

Different stages identified in the implementation of a Hydro - Electric Projects are

- Pre-execution stage
- Execution Stage
- Post -Execution Stage.

For completing the projects, individual responsibility will be fixed on each officer entrusted with a specific work and Team Leader/ Project Manager shall have the total responsibility in implementing a project entrusted with him. While submitting reports to higher officers, every officer shall give his specific recommendation instead of simply communicating the views of their subordinate officer.

# **1. PRE-EXECUTION STAGE**

## **1.1 Investigation**

### **1.1.1 Project Identification.**

Once scope for development of a potential hydroelectric project is identified with the help of GTS map or site inspection, a feasibility study is to be conducted. The sanctioning authority for conducting feasibility study shall be the **Executive Engineer** of the concerned investigation field division. The technical sanction for works involved in feasibility study is to be obtained from the respective officers according to the delegation of powers subject to budget provisions.

### **1.1.2 Feasibility Study**

The investigation division shall arrange the works required in connection with the feasibility study and a feasibility report shall be prepared. The Executive Engineer of the concerned investigation division shall forward the feasibility report and get it approved from the concerned Deputy Chief Engineer for further investigations.

### **1.1.3 Preliminary Investigation**

On getting approval for the feasibility report, preliminary investigation shall be done by the concerned investigation division for the preparation of preliminary investigation report. The Technical sanction for works involved in preliminary investigation is to be obtained from the respective officers according to delegation of powers subject to budget provisions. Then a Preliminary investigation report is to be prepared by the Executive Engineer concerned. This shall be sent to the **Chief Engineer through proper channel for approval and shall be informed to the Board.**

### **1.1.4. Detailed Investigation**

On getting sanction, the detailed investigation survey work is to be carried out by the concerned investigation division. The Technical sanction for works involved in Detailed investigation Report (DIR) is to be obtained from the respective officers according to delegation of powers subjected to budgetary provisions. The Detailed investigation report prepared based on the detailed investigation survey shall be forwarded to the Chief Engineer. The field officers, during the course of detailed investigation and preparation of DIR shall be in touch with the Chief Engineer's Office, to obtain guidance from there in order to explore all possibilities and alternatives including techno-economic feasibility of the project.

All the works in connection with different stages mentioned above shall be done as per the guide lines of Central Board of Irrigation and Power (CBIP), CWC and CEA in order to ensure the inclusion of all the details required for the preparation of Detailed Project Report (DPR) in the DIR.

## **1.2. Preparation Of DPR**

DPR is to be prepared in the office of the Chief Engineer based on the DIR obtained from the field. DPR shall be prepared as per the guidelines issued by CWC/ CEA from time to time. Proper co-ordination shall be initiated by the Chief Engineer concerned with the Chief Engineer (Generation) for the finalisation of electro-mechanical equipment and power evacuation system. The cost estimate included in the DPR is the basis of issuing administrative sanction. Hence, proper care shall be exercised for arriving at the total cost of the project.

The DPR so prepared shall be submitted to the Board for approval. The DPR prepared shall also include the cost of energy generated from the project, which is one of the prime criteria for approval of DPR. The Board will approve the DPR based on the recommendations of the DPR evaluation committee constituted by the Board and Board will accord administrative sanction for the project.

## **2. EXECUTION STAGE**

After getting Administrative sanction for the project, a Project Manager will be given the charge for the implementation of the project. All activities mentioned hereunder are the primary responsibilities of the Project Manager. Various units such as Forest & Environment Management Unit (FEMU), Design wing, Research organisation, DPR units, Generation wing, corporate planning etc are functioning in the Board for undertaking different tasks such as obtaining clearances, land acquisition, model studies, mix designs, material tests, structural design, co-ordination, planning and review etc. In order to avoid delay in implementing the project, the Project Manager shall arrange necessary follow up actions including sparing his staff to various units to co-ordinate with these units to obtain speedy implementation of project.

### **2.1 Clearances**

All statutory clearances fixed by the Central and State governments shall be obtained by the concerned / (on behalf of the) Chief Engineer. Furnishing of the required details and follow up actions at different levels for obtaining the clearances shall be the responsibility of the concerned Project Manager.

## **2.2 Land Acquisition**

Land acquisition shall be done only after getting necessary clearances but all procedures including survey works required for land acquisition shall be done along with the process for obtaining clearances.

For speedy acquisition of land, negotiated purchase shall be followed for private land. For this Committee shall be formed with MLA as chairman, representatives of local self-government, representatives of trade unions and the District Collector, Chief Engineer concerned as committee members. The Project Manager concerned shall act as the **convener of the committee**.

The Tendering process shall be commenced only after the acquisition of the land and after getting stage-I clearance in case of projects involving forestland.

## **2.3 Preparation of Estimate**

The detailed estimate for the project shall be prepared based on the tender drawings, site conditions, current PWD schedule of rates and guidelines issued by CWC. Care shall be taken to include all possible items so that requirement of extra items during execution could be avoided. Minimum provisions shall also be given in the schedule for all the probable items so that number of extra items could be reduced to a minimum. In order to minimise the variation in the executed quantity to the possible extent, accuracy shall be exercised in assessing the quantity of various items. For the preparation of estimates, **completion reports** of previously executed projects shall be referred instead of referring previous sanctioned estimates so that a realistic quantity can be worked out. As far as possible, Lump Sum quantities and Lump Sum provisions shall be avoided. Wherever it is provided, it shall be substantiated with supporting details. The estimate shall be provided with all relevant particulars as stipulated in PWD code viz. conveyance statement, estimate report, docket sheet, basic data, sub data, user rate, main data, quantities sheet and abstract of estimate. The estimate shall also be provided with quantity calculation sheets, reference drawings, plotted sections etc. Separate estimate for civil works and electro mechanical works shall be prepared and Technical Sanction shall be issued by the respective Chief Engineers. While issuing technical sanction, the same shall be placed before the Board /Full time members for information. The Financial Advisor, Chief Internal Auditor and the Accountant General shall also be informed of the technical sanction.

## **2.4 Preparation of Tender documents**

There is a standard general condition of contract named as 'conditions of bid and contract' applicable for all projects. The Project Manager shall formulate special conditions required for the project and shall prepare technical specifications, schedules, tender drawings etc. and get approved from the Chief Engineer. The special conditions, if any, required for the tendering for a particular project should be got approved from the Board before tendering.

## **2.5 Pre construction survey**

The pre - construction survey which includes soil and sub soil exploration works, triangulation works, establishment of permanent bench marks, making infrastructure such as power supply, approach roads, identification of location of dump yards, setting up of stores, storage yards, site offices etc. shall be the responsibility of the concerned Project Manager. The Project Manager in consultation with the Chief Engineer concerned, if required, shall arrange the inspection of Geologist from Geological Survey of India.

## **2.6 Preparation of preliminary drawings for tender purpose**

The concerned Chief Engineer shall arrange to prepare sufficient number of tender drawings along with the pre-construction survey works going on at site. The Project Manager shall ensure the preparation of tender drawings at the Chief Engineer's office and provide necessary field details as and when it requires.

## **2.7 Tendering**

The Chief Engineer concerned shall invite tender. He shall have the responsibility of finalisation of pre-qualification, selection of bidder and making recommendation to the Board for awarding of work. He shall strictly adhere to the tendering schedule contained in the 'General conditions of Bid and Contract'.

The tenders shall be processed objectively and without intervention from extraneous factors. The subjectivity in processing tenders and extraneous factors are found to cause delay in taking appropriate decision in time.

In processing of tenders the following directions are to be scrupulously observed

1. Follow the standard and clear-cut procedures for all projects in tendering process.
2. Avoid subjectivity in dealing with an issue during pre-qualification and awarding of tender
3. Avoid correspondence with bidders after opening the PQ document.
4. Furnish clear-cut recommendation in time.
5. Avoid extension of date of submission.

The Chief Engineer concerned shall process the tender after getting remarks from the FA&CAO, LA&DEO and Chief Engineer (PED). The Chief Engineer shall finalise the pre-qualification and submit his proceedings for the same within the time frame specified in the conditions of contract. For awarding of work, the Chief Engineer shall make his recommendation to the Board within the time frame, after evaluating the

qualified tenders and considering the remarks of FA&CAO, LA&DEO and Chief Engineer (Generation).

## **2.8 Execution of Work.**

During execution, the Project manager shall obtain the necessary construction drawings from the concerned Chief Engineer's office well in advance. He shall prepare the schedule of requirement of drawings and inform the Chief Engineer. The Project Manager shall observe the progress of work and report to the respective authorities regularly.

Some specific instruction regarding the following items are issued for strict compliance:

## **2.9 Excavation and stacking of serviceable material**

The initial levels of the project area where earthwork excavation/filling is to be carried out shall be taken by the level measurements and checked by the superior officers and shall be reported to the Chief Technical Examiner (CTE), Inspection wing of Finance department, Government of Kerala at least 15 days before the commencement of excavation work. Before commencing the excavation works, plotted sections with initial levels and final levels in the drawings shall be plotted and got approved by the Project Manger. The intermediate levels for rock excavation shall also be taken stretch by stretch on completion of common excavation.

Dump yards for disposal of excavated spoil shall be specified to the contractor. Initial levels of dump yards shall also be taken and plotted before dumping the excavated material. All serviceable rock shall be selected from the dump yard, breaking into suitable sizes and stacked in a separate place viz. Stack yard; the initial levels of ground surface of the stack yard shall also be taken previously. The serviceable rubble obtained from excavation to be stacked shall be of size of 40 to 50 dm<sup>3</sup>. Normally for hard rock excavation, 1m<sup>3</sup> of excavation measured in solid result in stacking 1.5m<sup>3</sup> of serviceable rubble of size 40 to 50 dm<sup>3</sup>. Only serviceable material need be stacked in the stack yard. The volume of unserviceable material can be ascertained by level measurement of the dump yard. The rock excavation includes weathered, medium and hard rock. Normally, serviceable rock obtained from rock excavation will be less than 1.5 times the solid rock excavation and hence the quantity to be stacked shall be ascertained by calculating the hard rock quantity of the total excavation based on the core boring details.

The Excavation of rock and stacking of rubble obtained there from are very important items of works which have to be managed, recorded and paid with utmost care and caution. There fore unless the rubble obtained is stacked and measured properly it would not be proper to make payments for excavation. If the quality of rubble is up to the mark, it can be used for structural works .If the quality is poor it can not be used for structural work but can be used for other purposes. Hence, rubble obtained from the excavation shall be selected, sorted, broken in to suitable sizes and stacked for measurement to neat lines and levels in the stack yard.

As excavation is done by mechanical means and stacking is done manually the progress of both the works will not be at same pace. Hence, separate item shall provide for both items in the estimate and schedule. However, payment for rock excavation shall be



limited to 80% till required stacking of rubble of work is completed. Necessary conditions shall be provided regarding this in the technical specification.

### **2.10 Excess quantities**

Excess quantities if necessary shall be reported prior to execution to the Board in time through the concerned Chief Engineer and Member with proper recommendation and substantiating reasons. A copy of the proposal shall be directly sent to the Member and Chairman for their perusal and Officer from the vigilance wing of the Board or from the office of the CTE can be requested to inspect the work site before execution of such work.

### **2.11 Extra items**

Extra items of work can be executed only after assessment of its requirement, preparation of necessary designs if required, determination of reinforcement and after arriving rates of extra items. If the work is awarded to the same contractor, he will have to execute the supplement agreement. Therefore, there is sufficient time for reporting of these facts to the Board and to take approval. It is often seen that work worth millions of rupees are done as extra items or excess quantities with out approval of the Board and they are placed after several months for approval of the Board. This kind of procedure necessarily deprives the Board of chances of taking discretion on implementation of the extra item and excess quantities .There may be certain items of works which can be executed well below the tendered rate. In such cases, it would be better to entrust such items as separate work after inviting limited or open tenders after assessment of the time that would be taken for separately arranging the work and its impact on total execution of the work. Any officer who violates the norm /guideline shall be proceeded against. The Extra item if necessary for execution shall be reported to the Board through the concerned chief Engineer and Member by the Project Manager.

1. The requirement of extra items shall be reported to the Board through Chief Engineer and Member concerned in time.
2. If the requirement of an extra item costing 1% of accepted PAC and requires pre-measurement shall be reported to the Vigilance Wing of Board.
3. There exist specific and clear-cut conditions for execution of extra item in the conditions of bid and contract, which are to be scrupulously followed.
4. A separate technical committee shall be constituted by the Project Manager for each project consisting of the Project Manager, AEE's concerned, EE of the design wing and EE (Project Monitoring) of Corporate Planning to the look in to the necessity of the extra item and to analyse the rate and to submit the report to the authority concerned.

### **2.12 Over excavation**

Excavation shall be limited to the lines and levels specified in the design/excavation drawing. Tolerances if any permitted shall be indicated in the drawings itself. Excavation

beyond lines and levels occurred shall be brought to the notice of the Chief engineer and revised drawings shall be obtained if such over excavations are unavoidable. For such authorised excavations for which excavation drawings were issued subsequently, Payment can be made at the agreed rates for both excavation and back filling. If revised excavation drawings are not obtained, such excavations shall be treated as over excavations as per agreement conditions.

In such instances, the matter shall be reported within 3 days of occurrence and before back filling to the Board through the concerned Chief Engineer and member and also to the vigilance wing of Board with all relevant details such as chainage, reduced levels, plotted sections etc.

### **2.13 Over breakage/ Loose falls**

If over breakage or loose falls occur in any tunnel excavation, details of such excavation shall be brought to the notice of the Chief Engineer with all-relevant details and recommendations. The Chief Engineer shall inspect the site and issue revised drawings including remedial measures. The Project Manager shall regulate payment and shall make remedial measures as per the revised drawings. If revised drawings are not obtained such breakages and loose falls shall be treated as over breakage as per agreement conditions.

In such instances, the matter shall be reported within 3 days of occurrence and before back filling to the Board through the concerned Chief Engineer and member and also to the Vigilance Wing of Board with all relevant details such as chainage, reduced levels, cross sections etc.

### **2.14 Quality Control**

All materials supplied by the contractor shall be tested as per the relevant specification and certificates of such effect shall be recorded before making payment.

### **2.15 Mix designs**

Mix designs for concrete mixes designated in the construction drawings shall be done for the samples of materials supplied by the Contractor at Board's Research lab at Idamalayar or at KERI, Peechi or at concrete labs of Government Engineering colleges including that of NIT. Admixtures or additives recommended shall be arranged by board and issued at free of cost.

### **2.16 Deviations**

Deviations if any required from the construction drawings, due to the unexpected site conditions shall be brought to the notice of the Chief Engineer and construction drawings shall be got approved before execution of such work.

### **2.17 Construction drawings**

Scheduling of the requirement of construction drawings shall be done by the Project Manager and shall be informed the Chief engineer well in advance by the Project manager. The Project Manager shall be responsible for obtaining the construction drawing from the Chief engineer in time and issuing to the contractor.

### **3. POST EXECUTION**

#### **3.1 Completion Report**

On completion and commissioning, a completion report with capitalisation sheet shall be prepared by the Project Manager before passing the final bill. The Project Manager shall be responsible for closing of accounts of the projects within 6 months from the date of completion.

#### **3.2 Technical Completion Report**

All technical data from planning to completion such as hydrological data, drawing memos, specifications, design computations, model studies and reports, geological investigations and reports, construction drawings and as built drawings, operating manual and instruction form the suppliers of equipments, structural analysis reports, foundation conditions, construction aspects and remedial measures taken, construction techniques and methods, solutions for various problems faced during execution etc. shall be included in the technical completion report.

This report is a requirement of the future planning, studies and guidelines for implementation of new projects and used as reference manual. The data from the field offices shall be used for the preparation of technical completion report. The report shall be prepared in two volumes such as Vol- I- narrative portion and a volume II –drawing volume. The project Manager shall be responsible officer for the preparation of the technical completion report.

#### **3.3 Performance observation during defect liability period**

The Project manager shall be responsible for the observation of the performance of the project components, equipments, machines etc. and identifying defects if any and rectifying defects if any as per the terms of contract.

#### **3.4. Release of Security**

The security amounts shall be released as per the agreement conditions and only after getting sanction from the Chief Engineer concerned and intimation to the Board through the Member concerned.