Himachal Pradesh Agriculture Development Society

GOVERNMENT OF HIMACHAL PRADESH

HIMACHAL PRADESH CROP DIVERSIFICATION PROMOTION PROJECT

(HPCDP) JICA-ODA LOAN ID-P213

Quality Assurance & Control Manual

Prepared by
AECOM Asia Company Ltd. Hong Kong
In association with
NJS Engineers India Pvt. Ltd. and Agriconsulting S.p.A. Italy

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Himachal Pradesh Agriculture Development Society

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Quality Assurance & Control Manual

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The Quality Assurance and Control Manual is the outcome of the team effort. Most of the pragmatic procedures, tips and formats used in this manual are from the experience of other similar nature of project works. The QA&C Manual is devised and intended for BPMU and DPMU staff of PMU to assure and control the quality in construction works of infrastructure development. It lays emphasis on to establish a system of quality assurance and quality control that fits into the greater framework of monitoring of the physical and financial progress of the sub-projects. This manual presents the quality assurance plan, sub-project implementation arrangement, and quality assurance system for the construction implementation of infrastructure development works aiming to crop diversification promotion work within the Project area. The manual is a resource book for staff PMU and local development managers.

We would like to express our deepest gratitude to all those who provided us the support to complete this QA&C Manual. A special appreciation we convey to Dr. Y K Mahajan, Project Director, HPCDP, whose helping hand, and encouragement helped us to understand the background of this project, the intended objectives, and coordination with various government and non-governmental stakeholders.

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May the manual be prolific to many users!

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LIST OF ABBREVIATION

BPM	Block Project Manager
BPMU	Block Project Management Unit
CE	Construction Engineer
CQC	Construction Quality Control
DPD	Deputy Project Director
DPM	District Project Manager
DPMU	District Project Management Unit
GoHP	Government of Himachal Pradesh
HPCDP	Himachal Pradesh Crop Diversification Promotion Project
JE	Junior Engineer
JICA	Japan International Cooperation Agency
PD	Project Director
PM	Project Manager
PMC	Project Management Consultant
PMU	Project Management Unit
QA	Quality Assurance
QA&C	Quality Assurance and Control
QAP	Quality Assurance Plan
QC	Quality Control
SEM	Site Environment Management
SPMU	State Project Management Unit
S&WC	Soil and Water Conservation
HDPE	High Density Polyethylene pipe
PVC	Polyvinyl Chloride Pipe
GI	Galvanized Iron
MS	Mild Steel

Contents

1. Introduction

Himachal Pradesh Crop Diversification Promotion (HPCDP) Project is being implemented in five districts viz. Hamirpur, Mandi, Kangra, Una, and Bilaspur of Himachal Pradesh with the financial support from Japan International Cooperation Agency (JICA). The project aims at promoting crop diversification in target areas through the development of necessary infrastructures covering irrigation facilities and access road in parallel with technical training for farmers on vegetable cultivation, food grain cultivation and post harvesting technology. Under HPCDP, about 210 irrigation schemes covering new and rehabilitation and 147 numbers of farms access roads will be built during the project period.

The HPCDP is being implemented with the institutional arrangement of Governing Council at state under the chairmanship of Honorable Agriculture Minister, Government of Himachal Pradesh (GoHP), and the Executive Committee headed by Principal Secretary, (Agriculture), GoHP. At project level, State Level Project Management Unit (SPMU) at Hamirpur, and three District level Project Management Units (DPMU) have been constituted. Hamirpur DPMU will cover three districts namely Hamirpur, Bilaspur and Una, and remaining two DPMU, each will cover district Mandi and Kangra. Similarly eight numbers of Block Level Project Management Units have been constituted to manage the sub-project implementation. In addition, a project consulting team comprising of national and international staff has been provisioned to assist the PMUs and particularly the Project Director, HPCDP.

In order to execute the sub-project activities in smooth manner in terms of maintaining the quality of civil works (as per the technical specification), controlling cost overrun and time overrun, this document (Quality Assurance and Control Plan) has been prepared. The steps as well as methodology as suggested by this document will be followed and implemented during the course of execution of civil works by the project stakeholders including SPMU, DPMU, BPMU, Contractors and the Consultant. This document may be updated and revised periodically if required. The detail of Quality Assurance and Control Plan is presented in the following sub-sections.

2. Quality Assurance Plan

The Quality Assurance and Control Plan (QA&C Plan) is part of the Consultant's obligation to support the execution of civil works at field by the contractors in the sub-project level. The Construction Supervision work has to be carried out in accordance with the QA&C Plan. The plan defines the roles of the construction supervision team of the project and other stakeholders. This document is expected to be improved during the execution of the project based on the experience during the implementation of sub-project in coming years. It is expected that the members of the project team including SPMU, DPMU, BPMU and the Consultant will provide inputs for updating this document once they gain experience in coming years.

The execution of sub-project construction is expected to begin soon after the monsoon season in 2013 with the award of quite number of sub-project implementation. In any quality control system, the crucial task and role to be fulfilled is documentation. The habit of writing down events and field observations must be internalized and so become a routine reflex of thinking and doing of all supervisors.

The main objective of the plan is to establish a system of quality assurance and quality control that fits into the greater framework of monitoring of the physical and financial progress of the project/sub-project. In view of the role existing construction supervision arrangement, the plan aims to provide the sequence of checking, and measuring of works and materials during sub-project implementation.

In view of large number of contracts spread across five districts, and eight blocks, the attempt has been made to keep the QA&C process simple and handy to the extent possible. Therefore, an extensive use of standard forms has been suggested to adopt as a working tool. In the set of procedures and forms, the Plan defines the roles of the supervision staff of SPMU, DPMU and BPMU and the Consultant. The delineation of roles, tasks and responsibilities is not a formal one but the plan only points out the operational roles in the process of checking and approvals.

3. Sub-project Implementation Arrangement

There are four main organizations responsible for sub-project implementation in relation to the execution of sub-project. They include:

- The Employer/accepting Authority – Project Director, SPMU (PD-SPMU)
- The Engineer – District Project Manager (DPM), District Project Management Unit (DPMU)
- Engineer's Representative – Block Project Manager (BPM), Block Project Management Unit (BPMU) and his staff
- The Contractors

The roles and responsibilities of the Supervision Team particularly the District Project Manager of DPMU during the implementation of sub-project will mainly focus to ensure the followings:

- Works are executed in accordance with the General and Particular Conditions of the Contract, the Technical Specifications and Engineering Drawings or any amendments thereto;

- optimal use of available material resources has been made to minimize the costs to the Employer or to maximize the quality of the Works or to expedite construction; and,

- Works have been completed within the Contract price and specified time schedule as allowed by the Contract or any agreed amendments thereto.

4. Quality Assurance System

The Quality Assurance System does not attempt to display any details of construction or project work. That is the role of the Contractor and his approved methodology. The Quality Assurance System shows how the contractor's work will be inspected and tested, leading to approval. The SPMU, DPMU, BPMU as per their roles and responsibilities in accordance with the Contract Documents and its Clauses, and Contractor's systems merged together form the Project Quality Assurance System.

The main objective of the Quality Assurance Plan (QAP) is ***to establish a system of quality assurance and quality control that fits into the greater framework of monitoring of the physical and financial progress of the project***.

5. Overview of Quality Assurance System

5.1 System Management

The Project Director (PD), SPMU will have central authority for the overall control of entire execution of all sub-projects in the three DPMUs. DPD and all the DPM-DPMU and BPM-BPMU will report to PD-SPMU on weekly and monthly basis regarding progress achieved and quality issues if any in the construction implementation of the ongoing sub-projects. PMC construction engineers will assist PD-SPMU and his staff at DPMU and BPMU to check the quality assurance and quality control on periodic

basis. The District Project Manager, DPMU will have overall control of entire execution of sub-project implementation in the district. The Construction Engineer other relevant staff at District level PMU and Block Project Manager of Block Level PMU and his/her associates are to be made responsible to ensure that the quality system activities are being conducted by project staff in the manner specified in this Quality Assurance Plan and the Contract. The Block Project Manager at BPMU and key persons designated by him shall supervise the ongoing construction and implementation works, and check and review the quality system on daily basis. The district level PMU will supervise the quality system on weekly/monthly basis or as and when needed. The State level PMU will check and review the quality system on periodic or quarterly basis together with the support from PMC. The **Figure 1** portrays the Organization Chart for Construction Supervision showing the responsibility of the concerning level PMU and their frequency of quality control check.

5.2 Documentation and Data System

Contract Documents

All formally written correspondence to contractor, client, suppliers or any other official parties including; letters, memorandums, forms, minutes of meetings, site instructions, change orders, payment certificates, approvals, drawings, schedules, quantities, changes, variations etc. is collectively known as 'contract documents'. These must be handled and stored in careful way. They are official and legal records of the project. It must be remembered that any contract documentation could be the subjects of future litigation in the event of any claims etc.

Quality Control Forms

The Quality System requirements will specify which Quality Control Forms or other routine forms should be completed for which tasks and when they are necessary. Typical Quality Control Forms are given in the **Annexure-3.**

5.3 Process Control

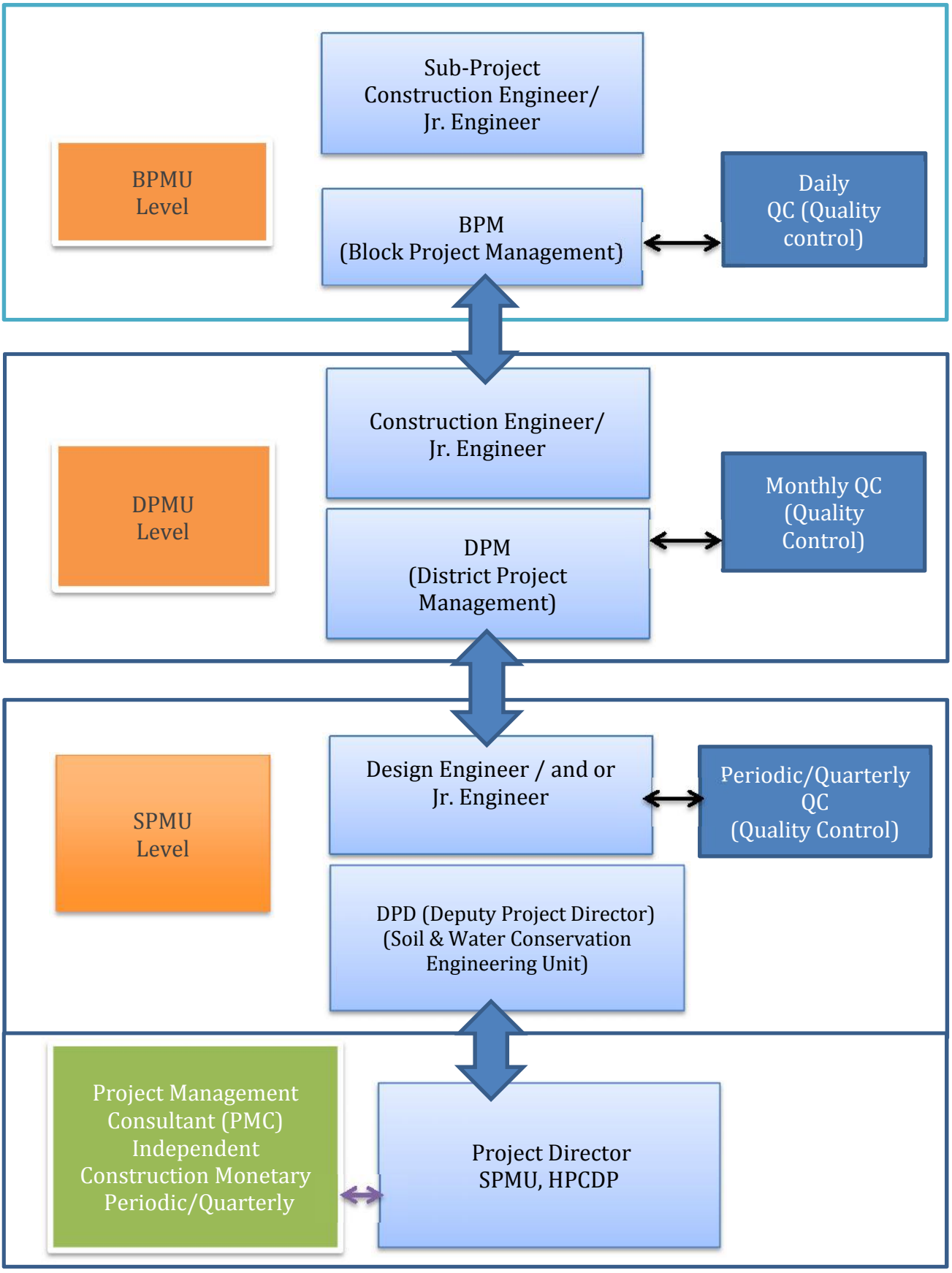
Source Approval

Because of the variability of both manufactured and other materials, source approval will be required before procuring the materials.

Taking Over Certificates

On substantial completion of a section, the PM-BPMU or his representative will inspect and list any deficiencies that need to be corrected before advising to DPMU to issue a meaningfully partial Taking Over Certificate. On Final Completion a Final Completion Certificate is issued after joint inspection by the PM-DPMU or his representative and the Contractor.

Figure 1: Organization Chart for Construction Supervision



Payments Procedures

The process of payments to Contractor should be quick, efficient and totally effective so that the contractor's due progress or cash flow is not affected in any way.

Interim Payment Procedures

The Contractor will draw up a monthly statement, which, after due inspection and modifications as required, will result in the BPM BPMU or his representative checking interim payment certificates. This is duly signed and forwarded to the DPM, who will issue the payment after his checking. Interim payment certificates are normally expected to be submitted monthly. When repeatedly quality of work is not up to the desired standard/level, the consideration will be made for partial payment (running bill) till the deficiencies are rectified.

Final Payment Procedures

The Final Payment Certificate is only produced on completion of the works and after it has been verified to be in accordance with the contract.

5.4 Quality Records

The supervision team particularly the BPMU team shall maintain quality records that contain sufficient information to permit verification of any report.

5.5 Code of Standards

The Codes and Standards referred to in the Technical Specifications Section of the Contract for works shall be followed. The other codes and standard which are not mentioned in the Contract Document could be accepted subject to the Engineer's/ DPM-DPMU's prior review and written approval.

6. Quality Assurance Plan (QAP)

The Quality Assurance Plan (QAP) prescribes specific quality practices, resources and sequences of activities relevant to the project. To be more specific, this document provides sequence of activities, quality checks and tests, type of inspection tools, quality records etc. with the purpose of defining how the quality system requirements will be met. Part of the Plan thus contains quality-control forms.

In order for the QAP to be a working document, it must be a practical and useful tool that is flexible enough to incorporate changes. In view of the large number of contracts spread over five districts, the Plan has to be simple. Therefore, use of standard forms has been adopted as a working tool. During field visits by team members of the supervision team, quality control forms will be filled in. They will provide a well-documented overview on the quality of the work done and facilitate the DPMU and BPMU to monitor all construction sites. The Quality Control Forms will be reviewed by the BPM-BPMU at first in order to assess whether the quality of work is maintained as per the specifications, work schedules and approved design drawings and to act for reports if the documents show poor quality of a specific item in a row.

The QAP does not attempt to copy or paraphrase sections of technical specifications, codes or standards since these are stated in the contract documents. Its aim is to ensure that the works are executed as per specifications, i.e. it is looked at as a means to achieve the end results. Quality control and test results shall be interpreted as applicable in accordance with the contract specifications. The subsequent sections of this Plan shall describe the above mentioned aspects.

7. Duties and Responsibilities

7.1 Project Director – PD-SPMU

PD-SPMU will be overall responsible for the entire construction implementation, quality assurance and quality control of the sub-projects in all five districts covered in the HPCDP Project area. PD will report to the JICA and DOA about the monthly and quarterly progress achieved by the Project. (tentative – needs to be refined)

7.2 Deputy Project Director (Soil and Water Conservation)– SPMU

DPD will be responsible for technical matters especially, quality assurance and quality control of the sub-projects in all five districts of the HPCDP Project area. DPD will follow up on major and specific issues on quality control and non-conformance issues. He will seek the reports and progress achieved from all three DPMUs on the ongoing sub-projects in five districts. On the necessity basis, he will also visit to concerning sites with the PMC construction engineers to check and ensure the quality control following the guidelines set in this Manual and the Contract Technical Specification. He will report to the PD-SPMU on monthly or required basis.

7.3 District Project Manager – DPMU

The DPM-DPMU will act as the Engineer for all the contracts to the sub-projects in the district. He will be overall responsible for the construction implementation and quality control and act like the nucleus for communication between the Contractors and the sub-project construction and quality control issues. For the amount allocated in the sub-project contract, he will issue the approval for the payment of the contractor's invoice, partial and final completion certificate. DPM-DPMU will report to PD, SPMU on monthly basis providing two copies of monthly reports (one to PD and one to Team Leader, PMC) by not later than a week after the completion of the reporting month.

7.4 Construction Engineer/Junior Engineer – DPMU

Similar responsibility as mentioned in BPMU level but check/record on weekly/monthly or periodic basis. Construction Engineer/Junior Engineer will check the quality control, other related matters. They/he will check the 20% of works done by the Contractors and the measurement as per the contract document and invoice submitted by the Contractors and forward to the DPM-DPMU for payment after getting improvement/correction.

7.5 Block Project Manager – BPMU

The BPM-BPMU will be overall responsible for the construction implementation, quality, cost and time control of the sub-project and interact with the Engineering section on day to day activities. He will report to DPM-DPMU on weekly basis for the progress achieved and quality control status and issues if any.

7.6 Construction Engineer/Junior Engineer- BPMU

Construction Engineer/Junior Engineer are responsible for all the day to day site supervision works, construction activities, checking of contractor's construction schedule and work plan. They/he will mark or check the lines, levels and layout of the sub-project on the basis of survey work done by the surveyor. They/he will help in preparing construction drawing and quantity estimate or they/he will check and make corrections to the working drawings submitted by the Contractors. Collection of samples of concrete works and testing at the stipulated laboratory will be their responsibility. They/he will take the support from supervisor and check quality system in construction activities on daily basis. They/he will check the test result of materials and construction activities. They/he will control the entire labor either departmental or the work to be executed by the Contractors. All the measurements of any type of work executed will be entered into Measurement Book (MB) with hundred percent test

check responsibility. For any delay in works, they/he will suggest the BPM-BPMU to seek revised work plan and schedule from the Contractor. They/he will check the invoice submitted by the contractors. They/he will prepare reports using the progress and quality control forms attached in **Annexure-3**.

7.7 Supervisor – BPMU

Supervisor assists the Construction Engineer/Junior Engineer in supervising works like labor supervision, material supervision and construction supervision. He will check the quality of proposed works under respective sub-component like concreting, wooden, pipe placement etc. under the guidance of Construction Engineer/Junior Engineer.

7.8 Duties and Responsibilities of Contractor

Construction contractors are responsible for the execution of the works in conformance with the requirements of the contract documents both in terms of quantity and quality.

(i) Overall Responsibilities

Contractors are responsible for arranging the followings:

- All necessary plant, labor, equipment and construction materials to be used in the permanent works;
- All plant, equipment, materials and labor for temporary and auxiliary works;
- Transportation and storage facilities for all materials and equipment.
- Office and accommodation for staff and labor;
- Facilities for the construction supervision teams as required by the contract; (if any)
- Sanitation facilities at the site;
- All necessary facilities and laboratories for testing and quality control as required by the contract; and
- Environmental protection/enhancement measures as required by the contract.

In addition, the Contractors are responsible for executing and completing the works in accordance with the specified standards and specifications, within the contractual time allowed, and within the contract price for the works. Contractors will be responsible for preparing working drawings for all civil works and obtaining their approval before the commencement of construction works if required by the Contract Condition.

(ii) Quality Control Duties

The contractor's main QA/QC duties are summarized in **Table 1**. Other duties shall be performed as stipulated in the contract documents or directed by the Project Manager-DPMU/BPMU/ their representatives.

Table 1: List of Contractor's Main QA/QC Duties

Activity/Item	Contractor's QA/QC Duties
Designs and drawings	• Maintain design/drawing register(s) at site • Use only approved drawings for construction • Replace drawings that have been modified with new ones
Test laboratory and equipment	• Following labs are existing in the vicinity of the Project area. Contractors have to make inquiry whether these labs provide services on commercial basis or not. Accordingly, they have to arrange and perform tests preferably in any of the following laboratories, if possible or take approval from DPM for any proposed commercial authentic lab. 1. Office of Chief Engineer, HPPWD, Dharmasala, Kangra district 2. N.I.T. Hamirpur 3. Office of Chief Engineer, HPPWD, Mandi

Activity/Item	Contractor's QA/QC Duties
	4. Office of Superintending Engineer, HPPWD, Bilaspur 5. Bhakra Beas Management Board, Nangal
Material receipts	• Enter receipts in material register showing the date of arrival, quantity, any manufacturer's certificate if applicable etc.
Materials testing	• Take test samples from the working mix/material in presence of Supervision staff • Perform materials tests as per contract requirements • Maintain test log • Prepare mix designs if required by contract and submit test results to the BPM- BPMU.
Material Storing/stock piling	• Make sure that materials are stored properly in the stores or demarked areas. • No contamination should be allowed • Hazards/poisonous material if any should be stored and handled in safe manner.
Rejected materials	• Enter in material register at site • Remove rejected material from site
Material consumption	• Enter daily consumption of materials in material register and indicate balance quantity
Construction equipment	• Maintain equipment in good working condition
Construction	• Intimate BPM-BPMU or his representative when construction is going to commence and what activities are proposed to be undertaken.
Daily work progress	• Maintain record
Testing of works in progress	• Perform tests as per contract requirements • Submit test reports to BPM- BPMU • Maintain test log
Rejected /Defective work items	• Rectify defective work and invite the BPM-BPMU or his representative for re-inspection. • Safe and proper disposal of rejected and unusable material.
Instructions from PM/Engineer	• Enter change orders, site instructions, letters and minutes of meetings issued by BPM-BPMU in the instruction log
Construction scheduling and control	• Prepare and update construction programs and schedules and undertake work in accordance with approved schedule • Submission of revised program as and when needed to recover slippage from the planned program and to set the works back on schedule.
Records	Maintain the following records on site: • site instruction book • signed copies of approved drawings • design/drawing register • test reports and test log • materials register • equipment register

8. Progress Control

This section of the Plan outlines requirements and procedures for construction scheduling and control of work progress

8.1 Construction Work Program

The Contractor is required to submit a detailed work program for execution of the works. This program preferably must show the following, as a minimum:

- Itemized work activities to be executed, based on the Contract's Bill of Quantities, indicating start and finish dates and scheduled achievement (progress) each month;
- Sequencing of work and activity interdependence;
- Calendar day estimates for submittal/invoices approvals; and
- Calendar dates for achievement of various milestones, and for completion of works by section and of the project as a whole, within the time periods provided for in the Contract.

The Contractor's program has to be approved by the Engineer /District Project Manager DPMU, as stipulated in the Contract. Once approved, the program cannot be modified except with the prior approval of the DPM- DPMU. The PM's approval of the program does not relieve the Contractor of his obligation to complete the works or sections of work within the time periods stipulated in the Contract.

8.2 Work Progress Control

The Contractor is required to undertake its activities in accordance with the approved work program. Each month the Contractor shall indicate the actual work completed as compared to work scheduled. In the event portions of the work are in danger of being delayed, or actually are delayed, the Contractor is to come up with a plan for remedial action.

Various circumstances may justify the changing of contract requirements for completion of the project on a specific date. Among these circumstances items not within the control of the Contractor, such as: changes to contract requirements (modification of Contract); suspensions of work; delays in providing access; force majeure, etc. Generally, such occurrences will justify a delay in completion if they affect activities on the critical path of the program. However, each instance must be carefully evaluated and fully documented before a decision can be made.

The following are guidelines for controlling work progress:

- There should always be a baseline program. If changes to the baseline program are required, an updated baseline program should be created.
- The Project Director-SPMU/DPM-DPMU or representative must monitor the progress of works, and the BPM-BPMU and the Contractor should update their completion percentages using mutually agreed-upon information.

9. Construction Quality Control in General

This section of the Plan provides an overview of construction quality control activities, including process control, testing, site inspection and tracking of instructions.

9.1 Construction Quality Control

Construction quality control (CQC) is intended to provide a comprehensive, common and consistent framework for quality control across various contract packages. CQC comprises two main elements of quality control:

- Testing
- Inspections

Testing control covers the type of tests to be carried out, frequency of testing and stage of testing. Inspection control covers the timing of inspections, what has to be inspected and the inspection procedures.

The contractors are responsible for the management of the construction works and in the performance of the required testing on all materials and of the various operations being carried out as per specification. The Engineer/DPM-DPMU's representative Construction Engineer or Junior Engineer of BPMU oversees the testing to ensure general compliance with the contractual stipulations. This includes laboratory and field-testing. Appropriately, the Engineer's/DPM-DPMU's representative might also oversee certain specific tests at the manufacturers' or other third party facilities in accordance with the specifications and good practice.

During the course of construction, contractors will carry out all routine testing for the purposes of source screening and construction control in accordance with the project requirements. This is a continuous process. CQC for any given activity should be practiced at all stages of construction from beginning to the completion.

9.1.1 Testing

Tests on materials and works as per specification are required to be carried out on site/laboratory during construction.

9.1.2 Site Inspection

Site inspections shall be carried out to ensure that the materials and construction activities conform to the specifications. Site inspections can be divided into day-to-day supervision and periodic site visits, as discussed below.

(i) Day to day Supervision

The Block Project Manager BPMU, and his field Engineers and supervisor shall carry out the day-to-day site supervision of all construction activities. This includes checking of lines, levels and layouts, and inspection of materials and construction activities. The day to day supervisory team shall ensure that materials that have been rejected are not used in the works.

As part of construction supervision, the BPM-BPMU or his representative would issue site instructions to the Contractor, as necessary from time to time.

The Contractor shall give advance notice to the Supervision Engineers when critical activities, such as concrete pouring is proposed to be undertaken and when a stage of work has been or is expected to be completed and/or covered.

(ii) Periodic Site Visit

Periodic site visits by senior staff from SPMU or DPMU or Consultant, provide an external review of quality of works executed. A tentative agenda for the periodic site visits is as follows:

- Physical inspection of the works under execution and inspection of quality of workmanship
- Review of site documentation and contractor compliance
- Sample verification of test reports and quality certificates
- Review of issues, constraints in quality system implementation
- Preparation of action plans for improving the quality
- Inspection of laboratories/plants in operation
- Performance appraisal of the Contractor

9.2 Quality Control of Materials

Quality control of materials forms an integral part of the overall construction and supervision function. It provides the link between the design and the finished works. It is imperative therefore that proper procedure be implemented to ensure that the materials used on the sub-project meet with the project specifications.

This section hereinafter describes the general manner in which materials for the works will be handled from initial screening to acceptance of the material.

9.2.1 Source Screening

The screening process basically refers to the Contractors' submittals of their proposed Suppliers seeking a "source approval". Each Contractor will contact a variety of manufacturers and distributors (Suppliers) for the various materials that will be used on for construction of the sub-project.

The Contractor shall provide complete information required for the screening process to the DPM-DPMU/BPM-BPMU for review. The Contractor's letter to which the Supplier information is attached must include all details.

On receipt of the Contractor's letter, the BPM-BPMU will review the information submitted. If he is satisfied, the Contractor will be notified that the BPMU has no objections to a particular supplier as a source of material. The BPM-BPMU will notify the Contractor if additional information is required. If the additional Supplier information is acceptable, the DPM-DPMU will so inform the Contractor that the Supplier may be used. The DPM-DPMU's approval of the Supplier will be subject to the Supplier (and Contractor) meeting all the requirements and stipulations of the contract. The DPM-DPMU's approval does not relieve the Contractor of his duty to ensure that only those materials which meet the project specifications are used.

The following summarizes the screening process:

- Contractor identifies the material(s) required for the project
- Contractor obtains all necessary information from the Supplier consistent with the project's screening requirements
- Contractor submits his proposed Supplier for the review to DPM-DPMU/BPM-BPMU
- BPM-BPMU reviews Contractor's submittal. Advises Contractor if additional information is needed
- BPM-BPMU indicates his approval (no objections) of the source to Contractor if appropriate, else, advises that the Supplier is unacceptable

- All approvals subject to supply of material in accordance with sub-project specifications and stipulations
- Contractor is not relieved of his responsibility by the Engineer's/ DPM-DPMU approval of named proposed supplier

The Contractor is urged to provide each of his proposed Suppliers with the sub-project requirements for the particular material.

9.2.2 Material Approval

Approval of construction materials shall be based on the following:

- Test reports for materials as per specification - Tests may be made at site laboratory or at manufacturer's premises or a at an independent testing laboratory; and
- Manufacturer's certificates of approved suppliers for certain materials such as- steel, cement, admixtures etc.

9.2.3 Control of Material at Site

The basic steps to proper material management are:

- Advance copy, if possible, of Factory Test Certificates or other certificates of quality (gives Contractor and BPM time to review the test results prior to the material arriving on site)
- The results of the Quality Tests (viz. the Factory Test Certificates) are checked by the Contractor (and the BPM-BPMU or his representative to confirm that the material properties meet the appropriate specifications. A copy of the Factory Test Certificate must be given to the DPM-DPMU within 7 days of the material's arrival.
- Samples may be taken to a third party testing facility.
- All material must be stored in an approved storage area that affords protection to the material as required under the contract specifications and stipulations.
- The management of the Contractor's storage facility rests with the Contractor.
- All materials must be stored appropriately.
- No rejected material may remain at the site.
- If rejected while on the truck, it may not be unloaded and must be removed from the site.
- At the work site, the material will be inspected and confirmed that no damage has taken place during transport or unloading. If the material has been damaged in transit/on unloading, and is subject to rejection, the Contractor shall remove from the site the damaged material.
- If material is damaged during construction processes (e.g., during installation, during concreting, during launching), the Site Engineer may deem the material as unsuitable for use. In this case the material would be rejected.

9.2.4 Certification of Material

Acceptance of certain manufactured materials, as stipulated in the contract, shall be based on test certificate(s) from the manufacturer conforming specified standards. Upon their delivery and before their installation or incorporation in the works, the BPM-BPMU shall inspect the condition of these items. Tentative list of Materials to be certified by Manufacturer:

- Steel Reinforcement
- Cement
- Paints
- HDP/PVC/GI/MS Pipes
- Reinforced Concrete Pipes

- Joint Filler Material
- Concrete Admixtures
- Steel Channel Sections and Iron Angles
- Barbed Wire
- Gabion wire
- Sluice Valve
- Reflux Valve
- Alfa Valve
- Non-return valve
- Control valve
- Pressure gauge
- Water meter
- Pump set
- Foot valve
- MS Flanges
- Nut Bolts
- Gasket
- Air Valves
- Zero Velocity valve
- MS plate
- Centrifugal pumps
- Submersible pumps
- Strainer
- Casing pipe
- Hume pipe
- Transformer
- Laboratory Equipment
- Geo-synthetics

All other items will be as specified in the contract documents.

10. Quality Control of Works

This section of the Quality Control Plan covers the procedures of reviewing contractor's method statements, job mix designs, inspection; and testing of works leading to approval. The works include, but not limited to earthworks, masonry, construction of cement concrete blocks and repair of hydraulic structures.

10.1 Construction Material

It is common practice for the Contractor to submit to the BPM-BPMU suitable method statements to execute a particular task for review and approval well before the planned start of operations. Because each Contractor has different management, and resources, the methodology for each particular task could be different. The methodology will include what, why, when and how the task will be completed in accordance with the contract conditions.

The responsibilities of safety while executing any task rest on the Contractor, irrespective of approval of his methodology.

10.2 Job Mix Design

Any recipe of one or more materials to produce a conforming product in accordance with prescribed standards and contract conditions is called job mix design. Such designs, if required by the technical specifications, must be proposed by the Contractor and approved by the Consultant.

The approval methodology will be as follows:

- The Contractor submits his proposed design, together with a Request for Inspection.
- The contractor will prepare trial mixes according to the requirements.
- The Engineer's/DPM-DPMU's Design Engineer/Construction Engineer/Junior Engineer will check, make any tests, recommend and approve.
- On approval by the BPM-BPMU, the Contractor may be instructed to demonstrate the adequacy by field trials.
- On approval, permanent works may be started.

10.3 Inspection and Testing of Works

The DPM-DPMU/BPM-BPMU will inspect and supervise the works to ensure that the works are executed using the approved materials in accordance with contract specifications. Before the commencement of concrete work, the contractor must seek permission to pour concrete work using the **Form-11** shown in **Annexure-3**. BPMU's Construction Engineer/ Junior Engineer (JE) should provide the approval for concrete work. Concrete samples will be collected using **Form-12** and any conceal works will be done only after completing process mentioned in the **Form-13**.

10.4 Sub-standard Works

Any work, in part or in whole, which Construction Supervision team including SPMU, DPMU, BPMU or their representative has determined to be of poor quality or in any way not in accordance with the contract will be regarded as sub-standard work.

The, BPM-BPMU or his representative must check all project works to the extent possible. On refusal of acceptance the Contractor must be given the opportunity to rectify any work. If this is not possible, or the BPM-BPMU does not approve rectification, the contractor must remove the offending item(s). The methodology to deal with sub-standard work is given below:

- The Contractor will construct the works in accordance with the contract specifications.
- The Contractor will perform required tests in accordance with the specifications, under the guidance of the BPM-BPMU/field Engineers.
- In the event that the work, or part of the work, does not meet the specifications or quality standards in accordance with the contract, the BPM-BPMU may give the contractor an opportunity to rectify the work.
- The work must again be inspected/tested and on acceptance may be approved on the request for approval on completion.

If in the opinion of the DPM-DPMU/BPM-BPMU the offending work cannot be effectively rectified, an instruction to remove the work, including any materials, detritus, and unsuitable materials will be issued. These materials must be removed from site and suitably disposed of.

11. Meetings

During the course of the Project, meeting will be initiated and attended by various parties. It is imperative that minutes be recorded during each meeting using **Form 5** depicted in **Annexure-3**. The transcribing of the

minutes should take place within a few days after the meeting has taken place. After review, minutes of meetings should be sent out to all parties in attendance at the meeting.

It is recommended that formal progress review meetings be held once in 15 days, if possible, between the client and the Contractor. The agenda for these meetings should include a review of compliance with various commitments made during the previous meeting, a review of progress and quality of works, discussion of various problems, and preparation of a list of actions to be taken.

12. Inspection of Contractor's Document

During site inspections, the BPM-BPMU's staff should check and follow up with the documentation maintained on site by the Contractor, as follows:

- Check the Drawing Registers and ensure that the approved designs and drawings are being used during construction;
- Check the Test Report Log;
- Check the Material Register and the material test reports
- Check the site instruction register and ensure that the Contractor, as recorded in these registers, is implementing the instructions.

13. Contractor's Invoice/Payment Certification Handling Mechanism

The payment procedure to Contractors' invoice will be as stated in section 5.3 Payment Procedure. The invoices submitted by the contractors need checking and processing in terms of measurement checking at site as well as administrative processing for the release of payments. In order to minimize the time for checking and processing of contractors invoices and release the payment in time, the following steps are recommended.

The contractor can prepare his invoice in a format as shown in the **Annexure-1** and present to the Block Project Manager who after taking measurement as described below in Measurement Book and after examination and attestation shall forward to the District PMU for further processing, checking and approving for payment.

The Junior Engineer / Construction Engineer can make entry to the measurement book following the procedures mentioned in the **Annexxure-2**.

14. Site Environment Management (SEM)

The environmental and social aspects on the sub-project site should be monitored by the DPMU and BPMU on regular basis.

The Contractor shall appoint an Environmental Monitor to follow the day-by-day monitoring procedures. The general objectives of the environmental management for the implementation of the Project are:

- Implementation of measures to prevent or reduce negative impacts to acceptable levels or to enhance environmental conditions
- Implementation of measures to deal with risks that arise during implementation and Defects Liability Period: occupational health and safety, accidents

- Implementation of measures that help ensuring that the environmental actions are in phase with engineering and other project activities throughout implementation
- Supervising and monitoring significant issues during installation and operation

The following potential risks *inter alia* should be addressed through the SEM:

- **Management of pollution incidents:** Care should be taken to avoid contaminating the canal system during construction.
- **Hazardous materials:** Storing and handling of hazardous material during construction. In India, facilities are available for the reuse / recycling of residues and wastes from petroleum products. Effective procedures shall be implemented under the Contract for the use of such facilities.
- **Construction wastes:** Collection and safe disposal of hazardous residues and dismantled material: The disposal of dismantled material shall be co-ordinated with local administration. Agreement for disposal site(s) should also include the collection and disposal of any existing waste material.
- **Quarry and Borrow Areas:** Management of quarries and borrow areas, if any
- **Traffic movements:** The sites are located in rural areas, most are some distance from main roads along narrow tracks. Careful control and supervision of movements of lorries and other construction traffic may be required to minimise the impact on crops and other vegetation etc. bordering the roads.
- **Air pollution:** All reasonable measures should be taken to avoid dust and other forms of air pollution.
- **Sewage:** Currently mains sewerage is not available at any of sites. It will therefore be necessary for the contractor to provide suitable facilities during the construction period for his staff.
- **Construction materials:** Management of quarries and borrow areas, if any, will be required.
- **Occupational safety and health:** Safety and health requirements shall be covered under a separate plan prepared by the Contractor.
- **Disturbance of rare birds:** All reasonable measures should be taken to avoid disturbance of rare birds.
- **Blasting:** Careful management of any blasting should be undertaken at all times.

Government of India has various rules and regulations on monitoring certain environmental and social considerations during the implementation of certain projects. Taking into account the intent of government rules and regulation and the Loan Agreement, a SEM Checklist has been prepared and shown in **Form 14** in **Annexure-3**. This **Form 14** has to be filled up by both the Junior Engineer of BPMU and the Contractor's representative.

15. Health and Safety Plan

The health and safety plan should include or address the following topics, where they are relevant to the work proposed. The Contractor shall observe high standards of safety for men and machines at all times and with regard to safety, and shall comply with following local laws and ensure strict adherence to the following:

- Labor Contract Regulation Act 1970
- Contract labor abolition and regulation Act 1974
- Workmen Compensation Act 1923
- Employers liability Act 1938

- Industrial disputes Act 1947
- Maternity benefit Act 1961
- Interstate migrant workmen (regulation of employment and conditions of service) Act 1979

The Contractor shall adhere to safe construction practices and guard against hazardous and unsafe working conditions and shall comply with the owner's safety rules as set forth herein.

Arrangements for Controlling Significant Site Risks

i. safety risks:
   - services, including temporary electrical installations;
   - working in confined spaces;
   - preventing falls;
   - work with or near fragile materials;
   - control of lifting operations;
   - dealing with services (water, electricity and gas);
   - the maintenance of plant and equipment;
   - poor ground conditions;
   - traffic routes and segregation of vehicles and pedestrians;
   - storage of hazardous materials;
   - dealing with existing unstable structures;
   - accommodating adjacent land use;
   - other significant safety risks.

ii. health risks:
   - removal of asbestos;
   - dealing with contaminated land;
   - manual handling;
   - use of hazardous substances;
   - reducing noise and vibration; and
   - other significant health risks.

Form-15 in **Annexure-3** should be referred and filled in to prevent the health and safety risks in the construction site.

16. Progress and Quality Control Forms

The following forms are proposed for progress and quality monitoring purpose.

Form No	Name of Form
Form -1	Site Register
Form – 2	Weekly Site Report
Form- 3	Site Inspection Report
Form - 4	Physical Progress Report (Monthly)
Form - 5	Minutes of Progress Review Meeting
Form- 6	Reinforcement Check out Form
Form- 7	Monthly Financial Progress Report
Form -8	Field Visit Report (as and when the visit is made)
Form -9	Site Inspection Earthwork for Canal and Access Road
Form-10	Checklist for Earthwork for Canal and Access Road
Form-11	Concrete Pouring Control Slip
Form-12	Concrete Cube Test Report
Form-13	Concealed Works Control Slip
Form-14	Site Environmental Management Checklist
Form-15	Health and Safety Checklist
Form-16	Completion Certificate

The suggested forms and format as shown in the **Annexure-3** should be updated during the course of project implementation based on the experience and requirement. Additional forms and formats may be included if required.

Annexure – 1

Contractor's Invoice

Format A1-1: Contractor's Invoice (Running Account Invoices)

(For contractors: - this form provides for (1) Advance Payments (2) Payments for measured works) The form of Account secured advance which has been printed separately should be attached where necessary.

Division……DPMU…….. Sub-Division……BPMU……..

Cash Book Voucher No……Dated……

Name of Contractor……

Name of work……..

Serial No. of this invoice……..

No. & Date of his previous invoice for this work……

Reference to agreement No……

Date of written order to commence work…….....

Date of actual completion of work……....

Account of Work Executed

Unit	Qty. executed upto date as per measurement book	Item of work ground under -sub-head and -sub works of estimate	Rate	Payment on the basis of actual measurements		Remarks
				Up-to-date invoice	Since previous invoice	
1	2	3	4	5	6	7
C/o						
			Rupees	Rupees	Rupees	
Total value of work done to date (A) Deducted value of work shown on previous invoice						

Unit	Qty. executed upto date as per measurement book	Item of work ground under "-sub-head" and "-sub works" of estimate	Rate	Payment on the basis of actual measurements		Remarks
				Up-to-date invoice	Since previous invoice	
1	2	3	4	5	6	7
Net Value of work since previous invoice (f) figure (F) In words Rupees……						

NB. When there are two or more entries in column 6 relating to each sub head of estimate these should in case of works the amount of which are kept by sub heads be totaled and the total recorded in column 6 for posting of the work abstract**.**

Certificates and Signature

1. The measurements on which are based the entries in column 1 to 6 of account I were made by ……..on……..and are recorded at page ……..measurement Book No……..
2. Certified that in addition to and quite apart from the quantities of work actually executed as shown in column 6 of Account I, Some work has actually been done in connection with several items and the value of such work (after deducting there from the proportionate amount of secured advances, if any, ultimately recoverable on account of quantities of material used therein) is in no case, less than the advance payments as per item 2 of the memorandum of payments made or proposed to be made for the convenience of contractor, in anticipation of and subject to the result of detailed measurements which will be made as soon as possible.

Dated Signature of officer Preparing the invoice ……..

Rank ……..

……

Dated Signature of contractor

Dated Signature of the officer authorized payments ……

Rank……..

Annexure – 2

Measurement Book

Measurement Book

The Measurement Book in **FormatA3-1** is the basis of all accounts of quantities of work done. The processes of completing the Measurement Book are as follows:

1. Entries at Commencement of Measurements
2. Writing of Abstract
3. Nomenclature of Item
4. Cross Reference in case of Running Account Bill
5. Recording of Date of Completion
6. Neat Recording of Measurements
7. Signature of the Contractor
8. Measurements in Ink
9. Making corrections in Measurements
10. Page Numbering
11. Recording of Measurements only by Authorized Persons
12. Certification of Measurements
13. Responsibility for Quality of Work
14. Test Checking of Measurements
15. Test Check by the District Project Manager

1. Entries at Commencement of Measurements

Each set of measurements to be recorded shall commence with entries stating:

A. In case of bills for work done:

a. Full Name of work as given in the Agreement/Estimate;

b. Location of work;

c. Name of Contractor;

d. Number and Date of Agreement;

e. Date of written order to commence work;

f. Date of actual completion of work;

g. Date of recording measurements

h. Reference to previous measurements;

B. In case of bills for supply of materials:

a. Name of Supplier

b. Number and date of Supply Order/Agreement

c. Purpose of Supply in one of the following forms as applicable to the case:

i. Stock (for all supplies for stock purpose).

ii. –Purchase for direct issue to the work (full name of the work as given in the estimate shall be mentioned).

iii. –Purchase for (full name of work as given in estimate) for issue to contractor…. on ….. :

d. Date of written order to commence the supply. e.

Date of actual supply

f. Date of recoding measurements

2. Writing of Abstract

A suitable abstract shall then be prepared which should collect in the case of measurements for work done, the total quantities of each distinct item of work relating to each sanctioned sub-head. The measurement books meant for this purpose shall contain pages in singleton. Details of quantities, rate and amount of each item for every bill shall be entered in this Measurement Book in a tabular form.

3. Nomenclature of Item

a) For recording measurements and also for preparing abstract, the agreement item number, both in words as well as in figure, shall be given neatly along with description of the item in full or in abbreviated form.

b) In case of extra/substituted item of work that is not covered in the agreement, the full nomenclature shall be reproduced in the Measurement Book.

4. Cross Reference in case of Running Account Bill

If the measurements are taken in connection with a running contract, a reference to the last set of measurements, if any, shall be given.

5. Recording of Date of Completion

a) If the entire job or contract has been completed, the date of completion shall be duly recorded;

b) If the measurements taken are the first set of measurements on a running account, or the first and final measurements, this fact shall be suitably noted against the entries in the Measurement Book, and in the latter case, the actual date of completion shall be recorded.

6. Neat Recording of Measurements

All measurements shall be recorded neatly in the Measurement Book.

7. Signature of the Contractor

The signature of the contractor or his authorized representative shall be obtained in the Measurement Book for each set of measurements.

8. Measurements in Ink

The measurements shall be recorded in ink.

9. Making corrections in Measurements

a) No entry shall be erased or overwritten. If a mistake is made, it shall be corrected by crossing out

the incorrect words or figures and inserting the correction. The correction thus made shall be initialed and dated by the officer recording/checking measurements.

b) When any measurements are cancelled or disallowed, these must be endorsed by the dated initials of the officer ordering the cancellation or by a reference to his orders, initialed by the officer who made the measurements, the reasons for cancellation being also recorded.

10. Page Numbering

a) The pages of the Measurement Books shall be machine numbered.

b) Entries should be recorded continuously and no blank page left or torn out. Any pages or space if left out blank inadvertently shall be cancelled by diagonal lines, the cancellation being attested and dated.

11. Recording of Measurements only by Authorized Persons

All items of work irrespective of their cost shall be measured and recorded by the Construction Engineer/Junior Engineer of the work. It is, however, open to the Block Project Manager to record measurements for any particular item of work himself.

12. Certification of Measurements

The person recording the measurements shall record a dated certificate –Measured by me over his full signature in the Measurement Book.

13. Responsibility for Quality of Work

a) The officer who records/tests checks the measurements for an item of work will be responsible for the quality, quantity and dimensional accuracy of the work.

b) The Construction Engineer /Junior Engineer shall make special efforts to be present at site when work is going on and must ensure quality of the work through appropriate checks.

14. Recording and Test Checking of Measurements

Block Project Manager is required to check measure the works in his charge as below:

a. All items of work in a project irrespective of their cost, shall be measured and recorded by the Construction Engineer/ Junior Engineer. It is, however, open to the Block Project Manager to record measurements for any particular item of work himself. In case of absence of Construction Engineer/ Junior Engineer, Design Engineer may be asked to record measurements.

b. The officer accepting the tender for any work, may stipulate and require the Block Project Manager to record measurements himself or exercise 100% check on the measurements recorded by his sub-ordinate for any item including those, which, owing to their situation, cannot subsequently be check measured or which have very high unit rates or which in the opinion of the officer are important.

Items of work which owing to their situation cannot subsequently be checked. These items are classified generally as below:

i. All work below ground level such as Concrete, Masonry, Steel work, etc. in foundation; and

ii. Lines of pipes buried in floor or masonry in water supply or drainage installations;

iii. Earthing installation, cable laying, etc.

15. Test Check by the District Project Manager

a) The District Project Manager (DPM) shall test check 20% of the measurements recorded. Measurements selected by DPM shall be independent of measurements test checked by BPM.

b) The individual items checked shall be clearly shown in the Measurement Book, and the result recorded by the officer concerned. The items thus checked shall be attested by the dated initials of the Checking Officer.

c) Consolidated record of checks/test checks:

(i) A collective record of all the checks carried out from time to time will be prepared in each Measurement Book in the following form:

i. Date of Check;

ii. Page recording measurements subject to test check;

iii. Value of measurements checked;

iv. Result of the check exercised;

v. Dated initials and designation of the checking officer

(ii) The result will be indicated by the word –Satisfactory or –Unsatisfactory as judged at the time on merits of each case. Unsatisfactory result will be communicated to the Construction Engineer/ Junior Engineer or both the Construction Engineer/ Junior Engineer and BPM as the case maybe.

An account of issue and receipt of Measurement Book shall be maintained in **Table A3-1**. All the Measurement Books shall be maintained serial.

Format A3-1: Measurement Book

PMU ……..

Measurement Book No……..

Name of Officer……..

Designation……..

Date of first entry……..

Date of last entry……..

N.B. This portion should be printed as a title page.

Name of work……..

Situation of work……..

Agency by which work is executed……..

Date of measurement……..

(These four lines should be repeated at the commencement of the measurements relating to each work)

Particulars	Details of Actual Measurement					Remarks
	No.	L	B	D or H	Q	
		Length	Breadth	Depth or Height	Contents or Area	
(1)	(2)	(3)	(4)	(5)	(6)	(7)

Abstract

Particulars	Q'ty	Rate	Amount	Remarks

Table A3-1: Register of Receipts and Issues of Measurement Books

PMU……

S.No.	Number of measurement book	Name and designation of person to whom issued	Date of issue	Date of completion	Date of return to office	Date of destruction	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Annexure – 3

Quality Assurance and Control Formats

Form No - 1

Himachal Pradesh Crop Diversification Promotion Project

Name of Sub-Project:

Contract Package No:

SITE/WORK REGISTER

Contractor				**Job**							
Calendar				Year		Month		Date		Day	
	Subject			Details							
A	**Weather condition**			fair		cloudy		rainy		snowy	
B	**Temperature in degrees celsius**			8AM		12 Nn		15PM		18PM	
C	**Interruption of work owing to inclement weather**										
D	**working hours**			Morning				Evening			
				From		To		From		To	
E	**Number of workmen**										
		S.No.	**Type of Labour**	**Nos**	**Remarks**						
		1	Engineers								
		2	Technicians								
		3	Skilled Labour								
		4	Unskilled Labour								
		5	others								
F	**Material Supplied**										
		S.No.	**Type of Material**	**Unit**	**Quantity**		**Remarks**				
		1									
		2									
		3									
		4									
		5									
G	**Equipment in Use**										
		S.No.	**Type of Equipment**	**Unit**	**Nos.**		**Remarks**				
		1									
		2									
		3									
		4									
		5									
		6									
H	**Equipment Not In use**										
		S.No.	**Type of Equipment**	**Nos**	**Reasons for no work**		**Remark/repair date.**				
		1									
		2									
		3									
		4									
		5									
I	**Tests Carried out**										
		S.No.	**Status**	**Nos**	**Type of tests**		**Remarks**				
		1	Delivered for testing								
		2	Received after testing								
		3	others								
J	**Work Done**										
		S.No	**Type of work**	**Unit**	**Volume(approx.)**		**BOQ item**		**Remarks**		
		1									
		2									
		3									
		4									
		5									

Name/signature
Designation
On behalf of the Project
Date

Name/signature
Designation
On behalf of the Contractor
Date

Form No- 2

Himachal Pradesh Crop Diversification Promotion Project

Weekly Site Report (A)

Contract No : Sub-project : District/Block:

Name of Contractor : Reporting Period :

Days	General Weather Condition			Worker or Laborers		Material brought this week	Material Tested	Material Rejected	Remarks
	General remarks	Rainfall	Interruption due to weather to work	Skilled	Unskilled				
Sunday									
Monday									
Tuesday									
Wednesday									
Thursday									
Friday									
Saturday									

Signature of Site Construction Engineer: **Signature of PM-BPMU**

Himachal Pradesh Crop Diversification Promotion Project

Weekly Site Report (B)

Contract No: Sub-project: District/Block:
Name of Contractor: Reporting Period:

Days	Excavation	Lean Concrete	Masonry	Pipe Laying	RCC	E/w in filling	Cement Concrete /Brick Blocks	Sand Filter	Other activities in site	Remarks
Sunday										
Monday										
Tuesday										
Wednesday										
Thursday										
Friday										
Saturday										
Total Quantity										
Site instructions/comments if any										

(Please put the work activities as per the nature of the contract……????)

Contractor's Signature: **Signature of Site Construction Engineer** **Signature of PM-BPMU**

Form No -3

Himachal Pradesh Crop Diversification Promotion Project

INSPECTION REPORT

Monitoring of Quality Control

STRUCTURES:

District: …….. Block: ……..

Name of Sub-project: ……..

Contract No. ……..

Name of Contractor: ……..

Name of Work with Location: ……..

Description of work:……..

Date of Inspection: ……..

Reported by: ……

Designation: ……

Description of Work Activity	Work done was:				N/A	Remarks
	Good	Fair	Poor	Not done		
01. Setting out.						
02.						
03.						
04						
05.						
06.						

Signature/BPMU: **Signature /Contractor's Representative:**

Form No - 4

HIMACHAL PRADESH CROP DIVERSIFICATION PROMOTION PROJECT

PHYSICAL PROGRESS REPORT (MONTHLY)

District: ……

Block: ……..

Name of Sub-project: ……

Contract No: ……..

Name of Contractor: ……..

Description of Work: ……

……

Original Contract Value: ……

Revised Contract Value: ……..

Date of Contract Awarded: ……..

Date of Completion : ……

Date of this Reporting: ……..

Item No.	Description of Work	Total quantity		Completed			Total Progress %	Remarks
		Physical	Weighted %	Target during the month	Complete during this month	Upto date complete quantity		

Signature of Block Level Supervision Officer: _____ Date:- ……

Name: …… Designation: ……..…… (one copy to TL, PMC)

Form No - 5

Himachal Pradesh Crop Diversification Project

MINUTES OF PROGRESS REVIEW MEETING

Meting Conducted on: …….

Previous Meeting on: ……

Contract No: ……..

Name of the Sub-project: ……

Location (District/Block): ……

Name of Works:…….

Name of Contractor: ……

Work Order Date: ……

Contract Duration :……..

Completion Date :……

Elapsed Time: _____months_____%

Target of Progress of Work up to the reporting month:

_____%

Actual Work Completed: _____%

Compliance with Commitments Made During Last Review Meeting

Sl. No.	COMMITMENT IN LAST REVIEW MEETING			WHETHER COMPLIED	IF NOT, WHY & WHEN WILL BE COMPLIED	REMARKS
	Contractor	Consultant	Employer			

Revision of Progress, Quality and Coordination

Sl. No.	PROBLEMS, ISSUES, ACTIONS TO BE TAKEN	ACTION BY	DUE DATE

Any Other Business / General Comments:

Signature of Contractors:

Signature of PMU/DPMU/BPMU:

Consultant (if required) :

Form No - 6

Himachal Pradesh Crop Diversification Promotion Project .

REINFORCEMENT CHECK OUT FORM

NAME of District: …….. Name of Block.: ……..

Name of Sub-project : …….

NAME OF STRUCTURE: …… Date: ……

NAME OF CONTRACTOR : …….

POUR LOCATION: ……..

Sl. No.	Location (Drawing)	Dia of Bar Mm	Length m	No. Of Bars	Total Length m	Quantity of Concrete	Remarks

Representative Of Contractor	Construction Engineer or Representative

Form No - 7

HIMACHAL PRADESH CROP DIVERSIFICATION PROMOTION PROJECT

REPORTING MONTHLY FINANCIAL PROGRESS

District: …….. Block : …… Reporting Month: ……

Sl. No.	Contract No.	Name of Contractor	Name of Work	Contract Amount	Invoice During The Month	Payment during the Month	Total Payment	Financial Progress (up to date) %	Remarks
TOTAL									

Signature: ……..

Date: ……

Form No - 8

Himachal Pradesh Crop Diversification Promotion Project

FIELD VISIT REPORT (AS AND WHEN VISITED-BY SENIOR OFFICIALS)

District : ……
Block : ……
Contract No: ……..
Name of Contractor: ……..
Observation made by (Name): ……
Designation: ……..
Description of Work: ……
Location of Work: ……
Observed and communicated the following on (date): …….

A: Works completed Since last inspection	Work lagging behind	B: Works in progress	C: Works likely to start Before next inspection

Observations:

No.	Observations on Quality

General Remarks:

No.	Remarks/Instructions

Signature:

Original retained by: Construction Engineer /BPMU

Copy to District DPMU, Team Leader-PMC

Form No- 9

Himachal Pradesh Crop Diversification Promotion Project

INSPECTION REPORT

Monitoring of Quality Control

EARTH WORK: **Canal/Road Construction**

District : ……..

Block : ……..

Sub-project : ……..

Contract No. _____

Name of Work with Location: ……

Name of Contractor :

Description of work: ……

Date of Inspection: _____ Reported by: _____

Designation: _____

Description of Work Activity	Work done was:				N/A	Remarks
	Good	Fair	Poor	Not done		
01. Preparation of base. (Stripping of base, uprooting trees)						
02. Borrow pit & berm. (Clearing, location, providing crossbars)						
02 Profiling. (Dugbelling of base, profiles in sections)						
04. Fill material. (Removal of roots, grass and dirt)						
05. Compaction. (Placement in layers and breaking of clods)						
06. Finishing & turfing. (Cambering, rough dressing, sod for turfing)						

_____

Signature of Date: ……..

Form No - 10

Himachal Pradesh Crop Diversification Promotion Project

CHECK SHEET FOR CONSTRUCTION OF CANAL/ROAD EMBANKMENT

District: …….

Block : …….

Sub-project Name: ……..

Contract No. : ……..

Name of Work with Location: _____

Name of Contractor _____

Reach/Section (from Km. …… to Km. ……..)

1. TBM Established and Checked: Yes NO
2. Base Stripping: Yes NO
3. Erection of Profile: Yes NO
5. Selection of Borrow pit: Yes NO
7. Pre Construction survey: Yes NO
   & entry in L.B.
   (Refer L.B. number)
8. : Level Book Cheked Yes No
9. L.B. signed by Contractor / Employer: Yes No
10. Earth Compaction Equipment: Bulldozer/ Vibratory Compactor/ Vibratory Roller : Yes No N/A
11. Optimum moisture content (%):
12. Watering Arrangement: Yes NO
13. Arrangement for collection of soil samples: Yes NO

Checked by ……..

Remarks: …….
Cleared for commencing the Earthwork in this Reach/Section (From Km. …… to Km. ……)

Signature :
Date :

HIMACHAL PRADESH CROP DIVERSIFICATION PROMOTION PROJECT DATE:

Form-11: CONCRETE POURING CONTROL SLIP

Contract		**Contract Nr**	
		Drwg Nr	
Location		**Concrete Volume**	
Section for Pour		**Concrete Class**	

APPROVAL CHECKLIST (Before Pour)		**CONTRACTOR'S CHECKS**	**BPPU'S CHECKS**	**FURTHER CHECKS REQUIRED?**
Formation of Foundation	- **compaction** - **level**			
Shuttering	- **line** - **plumb/level** - **propping**			
Steel	- **size/spacing** - **fixing** - **cover**			
Box-outs	- **size** - **location**			
Waterstops **Joint Filler**	- **size** - **fixing** - **thickness**			
Embedded Parts	- **Kind** - **location**			
Cleanliness				
Concrete Materials	- **sand** - **gravel** - **cement** - **water** - **admixtures**			
Concreting Equipment	- **Batch. plant** - **mixers** - **conc. pump** - **vibrators** - **gen. Set** - **lights**			

Pour Requested		**hrs on**		**by**		**(Contractor)**	
Pour Approved		**hrs on**		**by**		**(Engineer)**	

	Time (1/2 – hourly)						
Checks During pour	**Slump**						
	Air Temp.						
Cube Ref Nrs	**- 7 days**						
	- 28 days						
	- 28 days						

REMARKS:

Form No – 12

Himachal Pradesh Crop Diversification Promotion Project

CONCRETE CUBE TESTS REPORT

District : Contract No.

Sub-project Name : Name of Structures:

Name of contractor:

Site/Location	Type of structure	Sampled date	Date of testing 7days	Date of testing 28 days	Strength obtained on 7 days N/mm2	Strength obtained on 28 days N/mm2	7 days strength required N/mm2	28 days strength required N/mm2	Remarks

Construction Engineer/J.E. Signature: _____

Contractor Representative_____

Date: _____

HIMACHAL PRADESH CROP DIVERSIFICATION PROMOTION PROJECT DATE:

Form-13: CONCEALED WORKS CONTROL SLIP

Contract		**Structure Type**	
Contract No.		**Location**	
		Section	
		Drawing No.	

APPROVAL CHECKLIST (Before work covered up)	**CONTRACTOR'S CHECKS**	**BPMU'S CHECKS**	**FURTHER CHECKS REQUIRED?**

Permission to cover up Requested		**hrs on**		**by**		**(Contractor)**
Permission to cover up given		**hrs on**		**by**		**(Engineer)**

REMARKS:

HIMACHAL PRADESH CROP DIVERSIFICATION PROMOTION PROJECT

Site Environmental Management Checklist

Site: **Form No.14**

	YES	NO	Comment
WORK CAMPS/ CONSTRUCTION SITE			
Layout			
Suitable site: Keep clear of farmland/ properties			
Minimise disturbance to existing vegetation cover			
Site roads aligned (site access road)			
Reasonable slopes			
Construction Wastewater			
Concreting wastewater collection/treatment facility adequate			
Dredging wastewater collection/treatment facility adequate			
Waste Collection/Disposal			
Pollution risk to surface/groundwater			
Pollution risk if flooded			
Appropriate hazardous waste disposal			
Plant for final disposal			
Refuse/scrap areas fenced			
Fuel Storage/vehicle repair areas			
Fueling areas			
Adequate spillage capacity			
Fire fighting equipment			
Public Health and Safety			
Measures to protect secure fencing around and within site			
Informal settlement outside camp			
Lighting of works			
Safe and secure electrical systems			
Water supply adequate (i.e.drinking water)			
Washing and showers			
Sanitation			
Refuse disposal plan			
Vermin,rats,cockroaches			
Accommodation/kitchens clean			
Regular public health authority inspection			
Water Quality (clean)			
Irrigation canals			
Lakes/wetlands			
Roadside drain			
Standing water near settlement/site			
Fire			
Incineration risk of waste materials			
Space between buildings			
Fire fighting equipment			
Fire fighting plan			
Correct storage of dry wood			
Air Pollution			
Dust control			

SOURCE OF MATERIALS/ HAULAGE			
Borrow Pits			
Acceptable site location			
Tests for contamination			
Suitable embankments (slopes)			
Topsoil stored			
Adequate drainage/silt traps			
Restoration plan including drawing			
Haul Roads			
Roads chosen and marked			
Adequate cross-drainage			
Speed restrictions observed			
Dust control			
Maintenance of roads			
Restoration plan			
Habitat Protection/To avoid breeding seasons			
Hunting/fishing out of season			
Fenced working areas			
Spoil Disposal			
Slopes 1:4			
Control of water for dredger			

Check carried out by Signed _____

HIMACHAL PRADESH CROP DIVERSIFICATION PROMOTION PROJECT

HEALTH AND SAFETY CHECKLIST

Site:

Form No.15

General site Check – for all areas where work is going on	**YES**	**NO**	**NOTES**
Are there any measures to protect the public from machinery?			
Can the workers call for help in an emergency?			
Is there any means of fighting a fire?			
Is there enough light (for nightworks) for workers to work safely?			
Are their any measures to protect workers on foot from machines?(e.g. wearing high-visibility clothing)			
Are the machines working at a safe distance apart?			
Are there measures to suppress dust?			
Is there a reasonably quick access for emergency vehicles?			
Is rubbish stored/disposed of safely?			
Check list for concreting operations			**No concrete works**
Do workers have proper protection for their skin?			
Is there water to wash off splashes of concrete?			
Are their safety guards on bar cutting/bending machines?			
If the rebar is being fixed in-situ, is there safe access for the workers (e.g. a ladder)?			
If the rebar is being lifted into place is it safely tied together? Is there a risk of bars falling?			
Are cranes parked on stable foundations, not to close to the excavation?Are foot supports being used?			
Check list for Site Camps			
Are there first aid facilities?			
Is there anyone trained in first aid?			
Is there good control of vehicle movements, and separate pedestrian routes?			
Are there Protection and warning signs used? (For flammables, electricity, traffic etc)			
Is there adequate water supply?			
Are toilet facilities clean?			
Are there washing facilities?			
Is there electricity supply earthed?			
Are the cables safely out of the way?			
If the cables are suspended, is there a risk of them coming in contact with tall equipment?			
If the cables are on the ground, is there a risk of them being damaged by vehicles?			
In workshops, are workers using protective equipment where needed e.g.:			
Ear defenders,			
Welding masks and gloves,			
Dust masks			
Is waste stored/disposed of safely?			
Are supplies stored/stacked safely so that they cannot fall or be blown down?			
Check list for worker welfare			
Are workers given regular breaks?			
Are workers given safety training?			
Is there a clean drinking water supply?			
Is there somewhere for workers to rest, protected from the weather (both hot and cold)?			
Are workers provided with correct clothing (warm clothes in winter)?			
Are there trained first aid staff			
Check list for excavations for structure construction.			
Is the excavator on stable ground?			
Are the side slopes safe?			
Is water being managed safely?			
Is there a risk of sides eroding and collapsing?			
Are there safe routes for people to get in and out of the excavation?			
Is there any risk of equipment falling into the excavation?			
Is there a risk of spoil heaps falling into the excavation?			
Working on or alongside water:			
Is there a safe, stable working platform for people and plant?			
Is there flow being controlled where possible?			
Is there safety equipment to rescue someone falling in to the water?			
Protocols and plans			
Are there plans for emergency?			
Are there risk assessments?			
Are there records of staff training?			
Are there records of incidents and near misses?			

Check carried out by Signed _____

Form No 16

Himachal Pradesh Crop Diversification Project

CERTIFICATE OF COMPLETION

1. Name of Contractor: ……..
2. Name of Sub-project …….
3. Location (District/Block): ……
4. Name of Work: ……
5. Contract No: ……
6. Actual Date of Completion: ……
7. Due date of Completion as per the Contract: ……
8. In accordance with the General Conditions of Contract, Clause …… it is hereby certified, that the works mention above, carried out by :

   ……

   as Contractor for the above work were completed & were accordingly taken over by the Employer with effect from …… .
9. Accordingly, the Defects Liability Period commenced on …….. and subject to Clause ……. of the Particular Conditions of Contract and being …… (…….....in words) days will expire on ……..

Signature of Project Manager:……...

Date :……..…