

**GOVERNMENT OF ODISHA  
DEPARTMENT OF WATER RESOURCES,  
PROJECT MANAGEMENT UNIT, OIIAWMIP  
5<sup>th</sup> Floor, Rajiv Bhawan, Bhubaneswar.**

**Identification .No. PMU- 09 /2016-17**

**Dt. 05.11.2016**

**INVITATION FOR EXPRESSIONS OF INTEREST**

The Chief Engineer-cum-Project Director, Project Management Unit (PMU) of OIIAWMIP, Department of Water Resources, (DoWR) Government of Odisha invites Expression of Interest (EOI) from Individual professionals for the following positions i) Construction Management Engineer- 2 Nos. (ii) Quality Control Engineer 2 Nos. (iii) Resident Engineer-8Nos, (iv) Quality Control Assistant-6 Nos, (v) Surveyer-8 Nos. for "Providing Construction Supervision and Management services for REM works in 4 Major and 3 Medium Irrigation Subprojects under OIIAWMIP, Project 2.The no. of posts for each category may increase as per project requirement.

Interested candidates may obtain more information, detailed Terms of References (TORs) from office of the Chief Engineer-cum-Project Director, PMU (OIIAWMIP), Bhubaneswar during office hours (i.e. 10.00 to 17.00 hours) on all working days between 05.11.2016 to 26.11.2016. The TORs and other information's together with CV format and other standard format are also available in the official website of [www.dowrodisha.gov.in](http://www.dowrodisha.gov.in) until 26.11.2016 up to 03.00PM. Last date and time for receipt of sealed EOI from the Individual professionals at the address given below by 26.11.2016 up to 3.00 PM. Late submission of proposals will not be considered for opening. The proposals will be opened at 03.30 PM on the same day in PMU conference Hall in the presence of applicants.

The undersigned reserves the right to cancel any or all proposals without assigning any reason thereof.

**Sd/-**

**Chief Engineer-cum-Project Director, PMU (OIIAWMIP),  
Department of Water Resources, Govt. of Odisha,  
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# Construction Management and Supervision Services – CS 1

## TERMS OF REFERENCE FOR INDIVIDUAL CONSULTANTS

### 1.0 INTRODUCTION

The Orissa Integrated Irrigated Agriculture and Water Management Investment Programme (OIIAWMIP) is under implementation with the assistance of Asian Development Bank (ADB). It aims to enhance the productivity and sustainability of existing 6 major, 9 medium irrigation projects, revival / improvement of 1400 lift irrigation schemes and other associated infrastructure activities. These irrigation schemes are located in the 4 northern river basin namely Subarnarekha, Burhabalanga, Baitarani, Brahmani and a part of the Mahanadi delta. The project would enhance the State capability in water planning, designing, construction, management including O & M of existing systems as well as improvement in other allied sectors in the above region.

The State has a net cultivated (sown) area of 6.16 million ha of which 4.9 million ha can be irrigated (irrigable area). So far 2.69 million ha has been developed for irrigation. An additional 0.47 M ha is being irrigated through ongoing projects. However, under existing irrigation schemes, the actual area with assured irrigation is about 74% of the developed or commanded area. The deficiency is due to infra-structure deterioration, inefficient system of operation, deficient O&M systems, lack of farmers' participation in O&M activities and lack of field channels to distribute water across farm plots.

The OIIAWMIP program addresses and is designed to alleviate the above constraints. Its intended outcome and impacts are increased agricultural productivity, water use efficiency and irrigation operational performance, resulting in enhanced economic growth and reduced poverty within a framework of PIM based agricultural growth in the 4 northern river basins and a part of the Mahanadi delta basin.

The tranche-2 scope includes the modernization of four (4) Major, three (3) Medium Irrigation projects.

### 2.0 BACKGROUND OF THE PROJECT

#### 2.1 Project Objective:

The broad objectives of OIIAWMIP are given below:

- i) To enhance productivity and sustainability of existing underutilized major, medium & minor irrigation schemes.
- ii) To increase income and reduce poverty through productive irrigation in selected river basins in Odisha.
- iii) To strengthen the State's institutional and technical capabilities in water resources development, management and planning, along with strengthening other relevant allied institutions.

- iv) To strengthen the Institutional base for participatory irrigation Management (PIM) with management reforms.

## **2.2 Subprojects for REM works under Project-2:**

Under Project 2 of Orissa Integrated Irrigated Agricultural and Water Management Implementation Programme (OIIAWMIP) it is proposed to complete REM work in 4 major, 3 medium sub-projects and associated infra-structure activities.

The REM works in each Subproject would consist of improvement / strengthening / sectioning / extension of existing irrigation canals and repair, renovation and new construction of canal structures.

The Subproject works will be bid in Construction Packages under National competitive bidding open to bidders who may bid on one or more contracts. The Construction Supervision and Management Services would be for all civil work packages and to be carried out by qualified National Consultants with satisfactory experience in implementing/ managing projects of similar nature and size.

Brief descriptions of the 4 major & 3 medium subprojects are as follows:

### **2.2.1 Machhagaon Sub-project**

Machhagaon Canal System designed for a capacity of 39 m<sup>3</sup>/s functioning for more than last 125 years. The project is having CCA of 34870 ha in Cuttack and Jagatsinghpur district of Odisha. Out of this, 21583 ha is getting full irrigation, whereas 10700 ha is getting partial irrigation and 2587 ha are deprived of irrigation.

The design discharge is not deliverable mainly due to reduced canal capacity and losses. The proposed improvement envisages canal lining at selective stretches, rehabilitation of structures, improvement of communication facilities, construction of new structures, renovation of distribution system etc. in order to stabilize and provide assured irrigation to total ayacut.

### **2.2.2 Pattamundai Sub-project**

Pattamundai Canal System designed for a capacity of 36 m<sup>3</sup>/s is functioning for more than last 125 years. The project CCA is 32693 ha with 8978 ha in Cuttack, 22,639 ha in Kendrapara and 1076 ha in Jajpur Districts. Out of this, an area of 12,112 ha is getting partial irrigation / deprived of irrigation. After renovation full ayacut of 32693 ha is proposed to be provided with assured irrigation.

### **2.2.3 HLC Range-I Subproject**

High level Canal Range-I System designed for a capacity of 18.63 m<sup>3</sup>/s is functioning for more than last 125 years. The project is having CCA of 14000 ha in districts of Cuttack (5800 ha) & Jajpur (8200 ha). The project is presently giving full irrigation to 6200 ha. Beyond this 2000 ha are getting partial irrigation and 3700 ha are deprived of irrigation. After renovation full ayacut of 5700 ha is proposed to be provided with assured irrigation.

#### **2.2.4 Kanjhari Sub-Project**

The project was originally designed to provide irrigation facilities to a CCA of 9740 ha in Keonjhar district. At present the project is giving assured kharif irrigation to an area of 6994 ha. Thus 2746 ha are deprived of getting irrigation, which is proposed to be restored.

After modernisation the project will give irrigation facility to a CCA of 9740 ha and annual irrigation of 12540 ha. The REM proposal envisages repair of head works, re-sectioning of main canal & distributaries, renovation of structures, providing lining at required patches of canals & construction of new structures, etc.

#### **2.2.5 Ramial Sub-Project**

The project was originally designed to provide irrigation facilities to a CCA of 7325 ha in Dhenkanal & Angul district. The CCA of the project is now reassessed at 6128 ha because of overlapping of Rengali left canal ayacut. At present the project is giving assured irrigation to an area of 4628 ha. Presently 1300 ha are getting partial irrigation and 200 ha are deprived of getting irrigation. Thus 1500 ha are to be restored.

After modernisation the project will give irrigation facility to a CCA of 6128 ha. The REM proposal envisages re-sectioning of main canal & distributaries, renovation of structures, providing lining at patches & construction of additional structures.

#### **2.2.6 Kansabahal Sub-project**

The project was originally designed to provide irrigation facilities to a CCA of 5050 ha in Sundargarh district. The CCA of the project is now reassessed at 4730 ha. At present the project is giving assured irrigation to an area of 2870 ha. Presently 1440 ha are getting partial irrigation and 420 ha are deprived of getting irrigation.

After modernisation the project will give irrigation facility to a CCA of 5050 ha. The modernisation proposal envisages repair of head work, lining, re-sectioning of distributaries, renovation of structures & construction of new additional structures, etc.

#### **2.2.7 MCIIP Sub-project**

Completion of MCIIP was approved for Tranche-1 but will be implemented in Tranche-2 of OIIAWMIP. This is an incomplete project and proposed to complete irrigation facilities in 5390 ha. The CCA of 5930 ha is in districts of Cuttack (735 ha), Kendrapara (4615 ha) and Jagatsinghpur (580 ha).

### **3.0 OBJECTIVES OF CSM SERVICES**

The objectives of the CSM Consulting Services are:

- (a) to ensure that high quality construction is achieved and delivered with ensuring that all work is carried out in full compliance with the engineering design, technical specifications and other contract documents;
- (b) to demonstrate efficacy of contract supervision & management by external agencies experienced in this field of work; and
- (c) to promote technology transfer either through joint ventures between expatriate and local firms or by deployment of Firm's own staff.

### **4.0 SCOPE OF SERVICES**

#### **4.1 Arrangements for Engagement of Individual Professionals.**

The Department of Water Resources (DoWR), Project Management Unit (PMU), Government of Odisha, will deploy Individual Professionals to assist Executive Engineers (Project Managers) in monitoring, on-site supervision, management of civil works contract and construction including Time control, Cost control and Quality control aspects of the works contracts. For this purpose the PMU require experts, resident engineers and support staff to be stationed at different sub-project offices. Since the loan closing will be in September 2018, it has been planned to complete all civil works packages within 24 calendar months. The following deployment plan has been prepared.

##### **(I) Pattamundai Sub-project:-**

Construction Management Engineer – One number

Quality Control Engineer – One number

Resident Engineers – Two numbers

Quality Control Assistant – Two numbers

Surveyor – Two numbers

Survey Attendant – Four numbers

Office Attendant – Two numbers

##### **(II) Machhagaon Sub-project:-**

Construction Management Engineer – One number

Quality Control Engineer – One number

Resident Engineers – Two numbers

Quality Control Assistant – Two numbers

Surveyor – Two numbers

Survey Attendant – Four numbers

Office Attendant – Two numbers

**(III) MCH Sub-project & HLC Range-I Sub-project:-**

Construction Management Engineer – One number

Quality Control Engineer – One number

Resident Engineers – Two numbers

Quality Control Assistant – Two numbers

Surveyor – Two numbers

Survey Attendant – Four numbers

Office Attendant – Two numbers

**(IV) Ramial ,Kanjhari & Kansabahal Sub-projects:-**

Construction Management Engineer – One number

Quality Control Engineer – One number

Resident Engineers – Three numbers

Quality Control Assistant – Three numbers

Surveyor – Three numbers

Survey Attendant – Six numbers

Office Attendant – Three numbers

The Construction Supervision personnel proposed at different sub-projects will work as a team headed by respective Construction Management Engineer and will report to respective Project Managers (Executive Engineers).

The Construction Management Coordinator (CMC) will directly report to the SE ADB Circle Cuttack while the team of supervisory members will report to respective Project Managers of respective sub-projects to assist them in supervision and management of civil work contracts. The Institutional Strengthening and project Management Consultant (ISPMC) will provide necessary guidance to PMU.

## **4.2 Overall Duties and Responsibilities of the Construction Supervision Team: -**

The construction supervision team shall assist the Project Managers to carry out all the duties normally associated with supervision and management of construction activities. This will include but is not limited to checking and review of contractors' progress.

The Consultants and the support staff will be at site as their duty station. The overall duty of the Consultants is to assist Project Manager in Contract administration and in monitoring and supervising the daily Construction Works of the project. Duties and responsibilities of the Team of Consultants also include:

- (a) To check all quantity measurements and calculations required for payment purposes and ensure that all measurements and calculations are carried out in a manner and at the frequencies specified in the contract documents.
- (b) To supervise the Contractor in all matters concerning safety and care of the works (including the erection of temporary directional and advisory signage) and, if required, to request the Contractor to provide any necessary lights, guards, fencing, and watchmen;
- (c) To advise the Project Manager on all matters relating to compensation events and disputes of the Contractor and to make recommendations thereon, including the possible recourse to arbitration.
- (d) To monitor and check the day-to-day quality control and quantity measurements of the works carried out under the Contract;
- (e) To carry out such duties which may from time to time be directed in writing by the Project Manager.
- (f) To monitor that contractor is complying with the stipulated conditions of contract agreement related to environmental and social aspects and submit monthly/quarterly report on the compliance to Project Manager.

## **4.3 Scope of Work**

### **4.3.1 Construction Supervision and Contract Management**

- Study the technical specifications that are provided by PMU as a part of the contract documents, designs and drawings of various components for the canal works.
- Review and recommend for approval the contractor's detailed work program, method statement for construction, availability and ensuring the adequacy of contractors' inputs in terms of materials, equipment, construction machinery

and human resources in accordance with the provisions contained in the work specifications / general conditions of contract / particular conditions of contract.

- Assist Project Manager's representative to set out on the ground the alignment of the Canal, location of the Canal structures and other works as per the standard engineering practices based on the dimensions and data provided in the approved construction drawings.
- Assist Project Manager's representative in recording Initial ground levels taken in presence of the authorized representative of the construction contractor. The CSM Team shall check and verify the governing ground levels and data relating to the site and its interface with the designs and drawings provided for implementation and give an expert opinion with regard to reaching a solution in case there are significant variations in these levels and data.
- Check and evaluate the contractor's mobilization on site with respect to machinery and personnel related to the project construction as per the provisions of the contract and their suitability and acceptability on site within the framework of the work and advise the Project Manager for granting permission to start the work.
- The CSM Team shall supervise the works that are executed by the construction contractor on a day-to-day basis through a team of site engineers and ensure that all the works are executed as per the technical specifications and in consonance with the work program approved by the SIO.
- Monitor and enforce, as detailed in the Contractor's Safety Manual, the measures established to ensure safety of the workers, other project personnel, the general public and works
- Monitor compliance by the contractor of the stipulated conditions related to environment and social aspects
- Assist the Project Manager in fulfilling his obligations as specified in the contract within the specified timeframe.
- Assist Project Manager in efficient contract management, the time control, quality control and cost control clauses of the Contract shall be scrupulously monitored. The consultant shall assist the Project Manager in periodic inspection of works.
- Assist Project Manager's representatives to write daily site diary which shall record all events pertaining to the administration of the Contract, requests form and orders given to the Contractor, and any other information which may at a later date be of assistance in resolving queries concerning execution of the works;



- Preparing Monthly/Quarterly Progress Reports in agreed formats for each sub-project in suitable project monitoring software, including physical and financial progress, reports on variations, time-extensions, problems and issues etc.
- Regularly monitoring physical and financial progress against the milestones as per the Contracts so as to ensure completion on time;
- Basing on “Request for Inspection” made by the contractor, the CSM Team shall assist the Project Manager or his representative in inspecting the work.
- Assist Project Engineer in checking all quantity measurements and calculations required for payment purposes and ensure that all measurements and calculations are carried out in a manner and at the frequencies specified in the contract documents;
- Assist Project Manager’s representatives in evaluating and processing contractors’ requests for interim payment
- To identify construction problems and delays and recommend to the Project Manager actions to expedite progress if the Works fall behind schedule;
- Assist Project Manager to interpret and apply various provisions of the contract documents with respect to the Contractor's conformance and compliance with his contractual obligations in general and with respect to compensation events leading to time extension, variations, additional compensation or payment of extra cost and disputes raised by the Contractor in particular and recommending appropriate decisions;
- To advise the Contractor to carry out all such works or to do such things as may be necessary in his opinion to avoid or to reduce the risk of any emergency affecting the safety of life or of the works or of adjoining property.
- To assist the Project Manager with the execution of the Taking Over of the work from the Contractor after completion of each Contract and preparing lists of deficiencies which need to be corrected.
- Assist Project Manager in checking the As-Built drawings of structures that are submitted by the contractor on completion of work.
- Assist Project Manager in preparation of Contract completion report of the work.
- Any other work that is needed for application of state-of-the-art technology for Construction Management and transfer of technology to SIO/PMU staff.

#### **4.3.2 Quality Assurance & Control**

- Review and recommend to the Project Manager for approval of the contractor's detailed Quality assurance & control plan for different component of work in accordance with contract provision.
- CSM Team shall ensure a system for the quality assurance of the works. The system of control of quality of materials and completed works shall include sampling methods and acceptance criteria. The sampling methods and the acceptance criteria shall be based on the Technical Specification provided in contract documents, and the recommendations of the relevant latest BIS codes, PMU's quality manual and other relevant publications and international practices.
- Review the suitability of sources of materials and their quality on the basis of inspection, test results and/or manufacturer's certificates.
- To check Contractor's field laboratory to conduct different quality control tests, calibration of equipment as per standard frequency specified in relevant BIS / specification and impart training to Contractor' personnel to conduct different tests.
- The CSM Team shall witness contractor's concrete mix design and ensure that cement content should be minimum possible / optimum for various grade of concrete prescribed as per IS 456-2000.
- The CSM Team shall undertake random representative sample checks as instructed by the Project Manager, independently for quality control in presence of representative of contractor and Project Manager. The CSM Team shall use laboratories of PMU/ Field Lab of Contractor / Lab of Engineering colleges / Govt. approved Laboratory performing desired tests which is better suited for timely quality control of work. The CSM Team shall have full access to witness / supervise all the tests in contractor's laboratory during contract implementation period.
- The CSM Team shall check all the records required to be maintained as per quality assurance plan of contractors periodically.
- The CSM Team shall review curing arrangement to ensure profuse curing be done in accordance with construction contract specifications.
- The CSM Team shall also furnish the summary of QC test results of all material of construction in each activity of work and O.K. cards as prescribed by the PMU and furnish a QC certificate (regarding quality of material, workmanship and performance) and issue no objection certificate for payment of contractor's invoices.

- The CSM Team shall supervise the works that are executed by the construction contractor through a team of site engineers and ensure that all the works are executed as per the specifications and in consonance with the quality assurance plan approved by the PMU.
- The CSM Team shall assist Project Manager's representative in checking and approving the reinforcement bar bending schedules given by the contractor as per the designs and drawings approved by the PMU. Concreting shall be allowed only after the bar bending schedules and the resultant reinforcement placed in the structure is approved.
- If the CSM Team considers any item of work is substandard or unacceptable, he shall inform the Project Manager and the contractor for any rectification required in writing immediately with full justification thereof.
- To perform all other duties not covered above to ensure that high quality construction is achieved and delivered.

#### **4.3.3 Environmental Safeguards Compliance**

The CSM team will check and ensure that the contractors have adequately adhered to the following elements;

- Adherence to Social Safeguards Policy of Government of Odisha and ADB;
- Compliance with the Environmental Management Plan (EMP) of the Sub-project during construction.

#### **4.3.4 Environmental Management Plan (EMP) Implementation**

- Assist SIOs in the implementation of EMP as defined in the Initial Environmental Examination (IEEs) Reports, including monitoring schedules and formats, and reporting
- Ensure systematic implementation of Environmental Management Plan (EMP) using environmental parameters and formats which have been developed by the project, as referenced in Subproject Initial Environmental Evaluation (IEEs);
- Identify the locations of environmental monitoring with assistance from PMU Environmental Specialist as needed;
- Undertake scheduled sampling/testing as part of environmental monitoring (i.e. carrying out testing of surface water, ground water, silt, soil, and noise as applicable) as stipulated in EMP of each sub projects in consultation with the concerned Project Manager;

- The environmental testing and monitoring shall be as per the suggested frequency as detailed in the IEE Chapter 8 section Environmental monitoring Plan and the test reports shall be submitted to Project Manager/ Executive Engineer on a monthly basis —as part of monthly reporting on EMP
- Assist the Project Managers for ensuring the civil works contractors comply with all the regulatory and statutory requirements of Government and ADB safeguards Policy as described in the IEEs and EMP of subprojects
- Ensure monitoring reporting by Contractors (in the prescribed format) is submitted to Project Manager/ Executive Engineer on a monthly basis.
- Assist the PMU and ISPMC Environment Specialist during field visits and for undertaking reviews of status and progress of EMP implementation

## **5.0 SPECIFIC TERMS OF REFERENCE:**

### **5.1. Construction Management Coordinator (CMC)**

The Construction Management Coordinator will be a qualified graduate civil engineer with not less than twelve years' experience and should have worked as Project Manager for a minimum of 3 years. Experience in implementing Project Management processes will be preferred.

The Construction Management Coordinator shall be overall responsible for the coordination in construction supervision and management activities of the civil works of the 7 sub-projects through the CSM team. He will be stationed at office of SE ADB Circle, Cuttack and report directly to the SE ADB Circle.

The Construction Management Coordinator should be competent in planning, designing, contractual management, resolving problems, quality maintenance, budgeting and financial control, progress monitoring, communication skills, documentation and coordination. The specific tasks include:

- (i) Assist the SE ADB Circle in the day-to-day management and coordination of construction works and related activities;
- (ii) Assist the SE ADB Circle in planning, control and management of the CSM teams' work;
- (iii) Assist in monitoring progress, evaluating results and identification and resolution of constraints;
- (iv) Prepare comprehensive reports of all 7 subprojects including inception, monthly, end of season and final reports;
- (v) Assist in developing a construction management system for the works;
- (vi) Assist in developing Quality assurance & control plan;
- (vii) The Construction Management Coordinator shall also provide technical support to the SE ADB Circle for resolution of the disputes.

### **5.2. Construction Management Engineer**

The Construction Management Engineers shall be graduate civil engineers with not less than ten years of experience as a site engineer in water resources/ infrastructure projects with experience in managing and supervising construction works. Experience in construction works in water resources sector will be preferred. (Retired Chief Engineer, Superintending Engineer will be preferred) The tasks will be to assist Project Manager in performing the

following activities:

- (i) Will function as Team leader of the CSM Team at site;
- (ii) Review the construction methodology and schedule submitted by the contractor and recommend to Project Manager for approval;
- (iii) Coordination with the relevant authorities at site during construction;
- (iv) Keep daily records of all aspects of their supervision works;
- (v) Approve the materials and equipment brought by the contractor;
- (vi) Monitor the environmental impact during construction;
- (vii) Check monthly measurement of work and certify payment;
- (viii) Ensure co-ordination between authorities and contractors, that the authorities are continually informed and consulted on the works program;
- (ix) Facilitate that complaints from the public and other stakeholders are attended to expeditiously and the Project Manager take the necessary action to resolve any conflicts arising;
- (x) Facilitate that any dispute arising with day to day work is resolved at site level by Project Authority;
- (xi) Advise Project Manager on claims, disputes and defect corrections certification;
- (xii) Report progress, trends which are likely outcome of contracts and other information required to the PMU;
- (xiii) Ensure that comprehensive records of the construction works are maintained;
- (xiv) Supervise commissioning on completion and that as built records and that appropriate operation and maintenance manuals are prepared;
- (xvi) Provide assistance to the Project Managers for total performance of the contract including compliance to all conditions of contract contained in the NCB contract that is awarded by PMU to the construction contractor.
- (xvii) In case of disputes relating to interpretation of General conditions of contract, Particular conditions of contract, work specifications as well as the billing by the contractor and payment by Project Manager, the Construction Management Engineer shall prepare necessary brief with required documentation for consideration at the level of the Adjudicator, if invoked by the contractor;
- (xviii) Any other duties assigned by Project Manager / Chief Engineer-cum-Project Director, relevant to the investment Program

### **5.3. Quality Control Engineer**

The Quality Control Engineers shall be graduate civil engineers with not less than ten years of experience in managing and supervising construction works and having experience in quality assurance of irrigation, water resources and/or major infrastructure projects. (Retired Asst. Executive Engineer, Deputy Executive Engineer, Executive Engineer will be preferred) The tasks of Quality Control Engineers along with Quality Control Assistants will be to assist Project Manager in performing the following activities:

- (i) Review and approval of the contractor's detailed Quality assurance & control plan for different component of work in accordance with contract provision;
- (ii) Supervision and monitoring of the Contractor's activity to ensure satisfactorily standards, quality assurance, control of workmanship and progress;
- (iii) Review the suitability of sources of materials and their quality on the basis of inspection, test results and/or manufacturer's certificates;

- (iv) Check Contractor's field laboratory to conduct different quality control tests, calibration of equipment as per standard frequency specified in relevant BIS / specification and impart training to Contractor' personnel to conduct different tests;
- (v) The QC Engineer shall check all the records required to be maintained by the contractor as per quality assurance plan periodically;
- (vi) Assist Project Manager's representative in checking and approving the reinforcement bar bending schedules given by the contractor as per the designs and drawings approved by the PMU;
- (vii) Check contractor's concrete mix design and ensure that cement content should be minimum possible / optimum for various grade of concrete prescribed as per IS 456-2000;
- (viii) To perform all other duties not covered above to ensure that high quality construction is achieved and delivered by the contractor.

#### **5.4. Resident Engineers**

The Resident Engineers shall be graduate civil engineering with not less than five years of experience/ Diploma in Civil Engineering with not less than ten years of experience in managing and supervising construction works. Experience in construction works in water resources sector will be preferred. .(Retired Asst. Executive Engineer, Deputy Executive Engineer, Executive Engineer will be preferred) The tasks of Resident Engineers along with the Surveyors at site will be to assist Construction Management Engineer and Project Manager in performing the following activities:

- (i) Check contractors' setting out;
- (ii) Quality of the materials and works;
- (iii) Coordination with the relevant authorities on site during construction;
- (iv) Keep daily records of all aspects of their supervision works;
- (v) Approve the materials brought by the contractor;
- (vi) Monitor the environmental and social impacts during construction and submit monthly reports;
- (vii) Check monthly measurement of work and certify payment;
- (viii) Facilitate co-ordination between authorities and contractors, that the authorities are continually informed and consulted on the works program;
- (ix) Facilitate that complaints from the public and other stakeholders are attended to expeditiously and take the necessary action to resolve any conflicts arising;
- (x) Facilitate that any dispute arising with day to day work is resolved at site level;
- (xi) Report progress, trends which are likely outcome of contracts and other information required to the PMU;
- (xii) Ensure that comprehensive records of the construction works and testing are maintained; and
- (xiii) Supervise commissioning on completion and that as built records and that appropriate operation and maintenance manuals are prepared.
- (xiv) Any other duties assigned by the Project Manager / Chief Engineer-cum-Project Director, relevant to the investment Program.

### 5.5. Quality Control Assistant:

The Quality Control Assistants shall be Diploma in Civil Engineering / Science graduates having minimum 5 yrs of experience in testing of construction materials at a reputed Laboratory.(Retired Asst. Engineer , Junior Engineer will be preferred).

### 5.6. Surveyor:

The Surveyors shall be Diploma in Civil Engineering / ITI trained having minimum 5 yrs of experience in topographic survey.(Retired Asst. Engineer , Junior Engineer will be preferred)..

## 6.0 STAFFING LEVELS AND EXPECTED DURATION

The table in Sec 6.2 shows project staffing requirements. It has been planned to deploy one Construction Management Coordinator at office of the SE ADB Circle at Cuttack; one Construction Management Engineer(CME) and one Quality Control Engineer(QCE) each at Machhagaon and Pattamundai; one CME and one QCE for MCII and HLC Range-I sub-projects and one CME and one QCE for all the 3 medium irrigation sub-projects; two Resident Engineers each at Pattamundai and Machhagaon major irrigation sub-project site and one Resident Engineer each in balance sub-projects.

### 6.1 Duty Station for Site Supervision Team

Duty station for the site supervision team will be on site with visits as required to the PMU/DOWR offices in Bhubaneswar for progress meetings and supervision discussions as required by PMU/DOWR. Concerned Project Manager/Executive Engineers will be required to make arrangements for Office accommodation at their duty station nearby the construction site. The cost of office accommodation and operating costs including all required travel fares, office supplies, vehicle rental, and all arrangements and costs for the team to be self-sufficient at the duty station site shall be met by the concerned Executive Engineers.

### 6.2 CSM Key Professional and Support Staff:

The following key professional staff (input durations are provisional) are planned to be deployed for the Service:

SL No.	Position	Qualification	Experience	Input months
1	Construction Management Coordinator (1 No.)	Graduate in Civil Engineering	12 years' experience and should have worked as Project Manager for a minimum of 3 years. Experience in implementing Project Management processes will be preferred.	20
2	Construction Management Engineer (4 Nos.)	Graduate in Civil Engineering	10 years plus as a site engineer in water resources/ infrastructure projects with experience in managing and supervising construction works..(Retired Chief Engineer, Superintending Engineer will be	20X4

SL No.	Position	Qualification	Experience	Input months
			preferred)	
3	Quality Control Engineer (4 Nos.)	Graduate in Civil Engineering	10 years plus as a site engineer having experience in quality assurance of irrigation, water resources and/or major infrastructure projects. (Retired Asst. Executive Engineer, Deputy Executive Engineer, Executive Engineer will be preferred	20X4
4	Resident Engineers (two each for 2 major projects Machhagaon and Pattamundai, one for each 2 major project MCII and HLC-I and 3 for 3 medium projects and MCII) – (9 Nos.)	Graduate in Civil Engineering	5 years plus as a site Engineer in civil engineering infrastructure projects. (Retired Asst. Executive Engineer, Deputy Executive Engineer, Executive Engineer will be preferred	20X9
			Total	280

### 6.3 Other Support Staff

Sl. No.	Position	Qualification	Experience	Input Months
1	Office Assistant- 2 Nos.			40
2	Quality Control Assistant– 9 Nos.	Diploma in Civil Engineering/Science Graduate	5 yrs of experience in testing of construction materials.(Retired Asst. Engineer , Junior Engineer will be preferred).	180
3	Surveyor – 9 Nos.	Diploma in Civil Engineering/ITI trained	5 yrs of experience in topographic survey.(Retired Asst. Engineer , Junior Engineer will be preferred).	180
4	Office Attendant-9 Nos.			180
5	Survey Attendants - 2x9 = 18 Nos.			18 x 400 days



## **7.0 REPORTING REQUIREMENTS AND TIME SCHEDULE FOR DELIVERABLES:**

### **7.1. Progress reporting:**

The Construction Management Engineers (Team Leader) shall prepare and submit monthly reports of the works, fully describing the progress of the works and indicating the problem areas and actions required to overcome them. The Construction Management Engineers shall also prepare and submit End-of-the season report at the end of each working season describing the progress of the works package wise and indicating the problem areas and actions required to overcome them. The Construction Management Engineers shall also prepare and submit Contract Completion Report on completion of works of a civil work package.

Within one month of mobilization, the Construction Management Engineers shall prepare and submit Inception Report describing the working methodology and work program for the services. The Construction Management Engineers will prepare and submit Final Report of the Services of the Team on completion of the Services.

### **7.2 Schedule of Reporting and Deliverables:**

The Construction Management Engineers are responsible for providing information and reports on the on-going activities and progress of work. The CME is required to submit, for each sub-project, the following reports to the Project Manager/ SE ADB Circle/ Construction Management Coordinator. All reports should be submitted as required below and in an electronic and hard copy format. All reports should contain an executive summary not exceeding two pages.

- i) Inception report plus soft copy, within one month of mobilization of the CSM team at site. This report should include the related work arrangements, the staff deployment schedule and details of programme of works.
- ii) Quality Assurance Plan plus soft copy - one month after mobilization of the team. The report should include type and nature of QC tests to be conducted, place of testing, acceptance criteria, frequency of tests, standard observation sheets and documentation based on approved construction tender documents.
- iii) Reports plus soft copy at monthly intervals and at the end of each construction season, summarizing financial situation of all work and contracts, progress achieved, difficulties encountered and issue to be resolved.
- iv) Monthly Reports of the EMP implementation monitoring using the monitoring check list and report format with all the relevant documentation, including reported irregularities or non-compliances and recommendations for any corrective action proposed.
- v) On-going Inventory of Records of Environmental monitoring test results as per the suggested frequency—which may be attached to the Monthly Reports.
- vi) Contract Completion Reports on completion of a package plus soft copy.
- vii) Final Report of the Services before 30 days of completion of the services.

### **7.3 Review & Coordination Meetings:**

Project Managers will ensure thorough coordination between each member of the CSM team and the Project staff at site. As a minimum, coordination will involve weekly or bi-weekly joint visits by the Construction Management Engineer and Project Manager to each of the job sites related to all the packages and regular (weekly, bi-weekly, monthly or quarterly) meetings at Project Manager/SE ADB Circle Offices.

Monthly review and coordination meetings with the CSM Team personnel and representative of contractors shall be held with the Project Manager/ Superintending Engineer to review the construction works.

A Quarterly review and co-ordination meeting with the Construction Management Coordinator and expert team members and contractors shall be held with the Chief Engineer-cum-Project Director, PMU at Bhubaneswar in order to review implementation and progress of the assignment. During the meeting the Construction Management Coordinator shall appraise about the progress of work during the quarter through a Microsoft Power Point / Multimedia presentation. All the suggestions comments that are made during such meetings shall be implemented by the CSM Team and Construction Contractors.

### **8.0 CSM Team's Office and Equipment:**

The Project Manager shall provide office space for the CSM Teams in the sub-project area preferably near Project Manager's office. The Project Managers shall also provide all office furniture, equipment, supplies, communications and transport at suitable locations in the Project area for efficient and coordinated performance of the Services.

All the Key Personnel shall be deployed at these offices. The authorized officials of PMU may visit their Offices any time during office hours for inspection and interaction with the CSM Personnel.

### **9.0 Payment:**

Each key professional and support staff will submit "monthly time sheets" through the CSM team leader indicating the daily activities done and presence in the assigned area to the respective Project Manager/Executive Engineers for payment of remuneration.

## **10.0 CLIENT'S INPUT AND COUNTERPART PERSONNEL**

### **Services, Facilities, Equipment to be provided by the Client**

- Office space including furniture and utilities including electricity and water charges
- Access to relevant reports, studies, data, photographs, maps, and institutions,
- Counterpart staff to work with the Consultants
- Other logistics support for carrying out fieldwork, including permission to use facilities such as Guest Houses, payable at the official rates, where possible, in connection with their official duties.
- Vehicle for site supervision,
- Office Stationary, office communication, office consumables etc. for running site office,
- Computer with printer facility, software;
- Levelling equipment all other tools required for the CSM team enabling them to function.
- Provide required numbers of Survey Attendants and office attendants to the CSM team for deployment in the work.

## CURRICULUM VITAE (CV) FOR PROPOSED NATIONAL EXPERTS

1. **Proposed Position:** \_\_\_\_\_

2. **Name of Expert** [*Insert full name*]: \_\_\_\_\_

3. **Current Residential Address:** \_\_\_\_\_

**Telephone No.:** \_\_\_\_\_

**Fax No.:** \_\_\_\_\_

**E-Mail Address:** \_\_\_\_\_

4. **Date of Birth:** \_\_\_\_\_ **Citizenship:** \_\_\_\_\_

5. **Education**[*Indicate college/university and other specialized education of expert, giving names of institutions, degrees obtained, and dates of obtainment*]: \_\_\_\_\_

6. **Membership in Professional Associations:** \_\_\_\_\_

7. **Other Trainings** [*Indicate significant training since degrees under 5 - Education were obtained*]: \_\_\_\_\_

8. **Languages**[*For each language indicate proficiency: good, fair, or poor in speaking, reading, and writing*]: \_\_\_\_\_

9. **Employment Record**[*Starting with present position, list in reverse order every employment held by expert since graduation, giving for each employment (see format here below): dates of employment, name of employing organization, positions held.*]:

From [Year]: \_\_\_\_\_ To [Year]: \_\_\_\_\_

Employer: \_\_\_\_\_

Positions held: \_\_\_\_\_

**NOTE: Maximum of 5 pages.**

<p><b>10. Detailed Tasks Assigned</b></p> <p><i>[List all tasks to be performed under this assignment]</i></p>	<p><b>11. Work Undertaken that Best Illustrates Capability to Handle the Tasks Assigned</b></p> <p><i>[Among the assignments in which the expert has been involved, indicate the following information for those assignments that best illustrate the expert's capability to handle the tasks listed in line 11.]</i></p> <p>Name of assignment or project: _____</p> <p>Year: _____</p> <p>Location: _____</p> <p>Client: _____</p> <p>Main project features: _____</p> <p>Positions held: _____</p> <p>Activities performed: _____</p>
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**12. Certification:**

I, the undersigned, certify to the best of my knowledge and belief— Yes    No

(i) this CV correctly describes my qualifications and my experience   

(ii) I am employed by the Executing or the Implementing Agency   

(vi) I am part of the team who wrote the terms of reference for this consulting services assignment.   

I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

\_\_\_\_\_ Date: \_\_\_\_\_

Signature of Professional

(Day/Month/Year)