

GOVERNMENT OF ODISHA
DEPARTMENT OF WATER RESOURCES

TERMS OF REFERENCE

Country:	India
Project Name:	Odisha Integrated Irrigation Project For Climate Resilient Agriculture (OIIPCRA)
World Bank Project ID:	P163533
Title of Consulting Services:	External 3rd Party Quality Control & Quality Assurance Consultancy Services for the "Odisha Integrated Irrigation Project for Climate Resilient Agriculture (OIIPCRA)" in Zone-I, BERHAMPUR.
Contract Type:	QCBS (Lump-sum)
Period:	16th NOVEMBER, 2020



ODISHA COMMUNITY TANK DEVELOPMENT AND MANAGEMENT SOCIETY
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TERMS OF REFERENCE

CONSULTANCY OF THIRD PARTY QUALITY CONTROL AND QUALITY ASSURANCE (QC&QA) FOR REHABILITATION OF TANK SYSTEMS AND IMPLEMENTATION OF TANK SAFETY REMEDIAL WORKS IN **ZONE: I (BERHAMPUR) UNDER ODISHA INTEGRATED IRRIGATION PROJECT FOR CLIMATE RESILIENT AGRICULTURE (OIIPCRA)**

1.0 BACKGROUND:

Government of Odisha is implementing the World Bank supported Odisha Integrated Irrigation Project for Climate Resilient Agriculture (OIIPCRA) through the Department of Water Resources (DoWR). The Govt. of India in the Department of Economic Affairs (DEA), in the Ministry of Finance, has approved the OIIPCRA on 23.2.2017. The cost outlay of the project is US\$ 235.54 Million (Rs. 1,683 Cr) out of which US\$ 165.00 Million (Rs. 1,179 Cr) is funded through World Bank (IBRD Loan) assistance at 70:30 (Centre: State) cost sharing. The period of implementation of the project is 6 Years from 2019-20 to 2024-25.

The project is being implemented through the "Odisha Community Tank Development & Management Society (OCTDMS)", a Special Purpose Vehicle (SPV) created under the Department of Water Resources (DoWR), Government of Odisha. 538 Nos. Of Minor Irrigation projects have been identified for rehabilitation in 15 Districts of Odisha in 4 river basins e.g. Rushikulya, Budhabalang, Baitarani and Tel Sub-basin covering about 56,200 Ha. These districts include Bolangir, Balasore, Bargarh, Bhadrak, Boudh, Gajapati, Ganjam, Jajpur, Kalahandi, Keonjhar, Mayurbhanj, Nabarangpur, Nuapada, and Subarnapur.

The Project Director, OCTDMS intends to apply a portion of the proceeds of this loan to eligible payments under the contract for which this Expression of Interest / Request for Proposals is issued. The Client now invites EOI / proposals to provide the consulting services for External Quality Control & Quality Assurance services for the civil works during the rehabilitation of 538 Minor Irrigation tanks taken up under this project in the OIIPCRA Project Period (2019-2020 to 2025-2026).

2.0 PROJECT DESCRIPTION:

The project development objective is "to intensify and diversify agriculture production, enhance climate resilience and improve water productivity in selected cascades of Odisha". The project beneficiaries will include small and marginal farmers, WUAs, farmer producer organizations and other agro-entrepreneurs.

The OIIPCRA project is having four main components, i.e., (1) **Component 1:** Climate Smart Intensification and Diversification in Production, (2) **Component 2:** Improving Access to Irrigation and Water Productivity, (3) **Component 3:** Institutional Capacity Strengthening, and (4) **Component 4:** Project Management. The Component 1 of the project is having two sub-components, i.e., (a) **Sub-component 1.1:** Support to Improved Productivity and Climate Resilience, and (b) **Sub-component 1.2:** Support to Aquaculture production. Similarly,

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Component 2 is having two sub-components, i.e., (a) **Sub-component 2.1:** Support to Water sector Reforms, and (b) **Sub-component 2.2:** Support to Investments in cascades.

3.0 PROJECT IMPLEMENTATION ARRANGEMENT

The project will be implemented by three line-departments, i.e., (1) Department of Water Resources, Government of Odisha, (2) Department of Agriculture and Farmers Empowerment, Government of Odisha, and (3) Department of Fishery and Animal Resource Development, Government of Odisha, with clearly defined role and responsibilities. The State Project Unit (SPMU), located within the Minor Irrigation Department office, will lead the implementation. A Technical Steering Committee, headed by the Chief Secretary, Government of Odisha will be the overall review and policy support system. At the district level, the office of the Collector and District Magistrate will be the nodal to steer the project and there will be a district level committee, in the name of District Level Project Management Team (DLPMT) to monitor and supervise the project activities.

4.0 JUSTIFICATION FOR THE CONSULTANCY

The objective of the project is to improve tank systems through rehabilitation and restoration of about 538 minor irrigation tanks with an estimated CCA of about 56,000 hectares, spread across 15 districts of the state. Majority of rehabilitation works include civil works such as strengthening of tank embankment, strengthening of tank structures, distribution system, feeder channel and field channels, Implementation of Dam Safety Expert Panel recommendations. Quality assurance during execution of civil works plays an important role in achieving efficient results under the given conditions and circumstances. In addition, capacity building of the Project/ Department staff to assess, maintain and ensure the quality of civil works and the safety of the projects is also essential for future sustainability. To ensure that there are no compromises on quality and civil works, and no slippages in processes, it is proposed to procure the services of a third party agency that will independently monitor and evaluate the quality of the civil works. Based on the findings and recommendations of this agency, the implementation and quality of works would be ensured to meet agreed designs and specifications.

5.0 OBJECTIVES OF THE PROPOSED CONSULTANCY

The objective of this Consultancy would be:

- To ensure that the quality of civil works along with workmanship is conforming to technical specifications, contract documents, designs/ drawings, relevant Indian standards.
- To ensure sound construction procedures.
- **Sound Construction Procedures.** Specially ensure that Fool proof arrangements have been made to assure the quality of construction.
- Deployment of the 'state of the art/ improved devices/ engineering instruments' to expedite quality control testing such as **Non-Nuclear Soil Density Gauge, Logging Cover Meter** for quality control of the compaction of earth fill

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placement and ensuring specified nominal cover in the construction of reinforced concrete structures.

*The tentative features and specifications are depicted in the brochures appended in **Appendix** for Illustration and broad guidance.*

- To undertake monitoring of the quality of materials used, construction procedures as per the agreed designs, and quality of outputs at various construction stages as per the bid specifications.
- To carry out the field tests required for assuring the quality in presence of the regular Water Resources Department staff and WUA committee members.
- To recommend measures for rectifying the defects observed during the inspection and ensuring compliance.

6.0 OUTLINE OF TASKS TO BE CARRIED OUT AND LOCATION OF THE WORK

About **270 Minor Irrigation projects** as per list below are proposed to be rehabilitated under **Zone-I**. All these tanks are to be covered during this consultancy period for which, the consultants will carry out Quality Control & Quality Assurance work.

Abstract of Minor Irrigation Projects					
Area	Name of District	Total no. of MIP	Ayacut (Ha) 40-100	Ayacut (Ha) 101-400	Ayacut (Ha) 401-2000
Zone-I BERHAMPUR	Boudh	10	8	2	0
	Gajapati	3	2	1	0
	Ganjam	251	213	37	1
	Kandhamal	6	5	1	0
	Total	270	228	41	1

These MIPs are located in **6** Minor Irrigation divisions in **4** districts: **Boudh, Gajapati, Ganjam, and Kandhamal**. The suggested sample is summarized in the table below according to different tank sizes. The summary is tabled below.

Category	CCA of the Tanks in Ha.	Approximate No of Project tanks likely to fall in the category	Approximate No of Project tanks to be monitored for QC & QA in the category	Minimum No of visits by Expert per Project	Minimum No of visit by Mobile Laboratory per Project
1	40 to 100	228	228 (100%)	05	04
2	101 to 400	41	41 (100%)	07	06
3	401 to 2000	1	1 (100%)	07	06
Total		270	270		

Zone-I, Berhampur

6.1 QUALITY CONTROL TESTING

Expected services to be provided by the consultant under this project would be as follows: The consultant would be required to ensure the quality of work by conducting the tests in-situ and laboratory including at least fully functional **One or more Mobile Quality Control Laboratory (MQCL)/ vehicle duly equipped** with necessary testing equipment (Bolero or equivalent) where MQCL accessibility is not possible at MI Division **Ganjam (Zone-I)**. MQCLs will be demonstrated within Two (2) months of signing the agreement at Zone Head Quarter, **Berhampur** and obtain due certification by the committee constituted by **Superintending Engineer, Southern Minor Irrigation Circle, Berhampur**.

The required functional MQCL (Mobile Quality Control Laboratory) is depicted in Appendix.

- a. The consultant will setup a full-fledged office in **Zone-I, Berhampur**.
- b. The consultant will develop MIS systems for monitoring and reporting of progress of works and their associated quality control and quality assurance aspects, acceptable to DPMU, SPMU, and GoO.
- c. Review meeting will be held every month to monitor the consultancy work.

6.2 CAPACITY BUILDING

Consultant will prepare and submit a format for quality monitoring in consultation with the Project Authorities. It should also conduct tank level tests in the presence of field engineers, contractor's representative & WUA.

7.0 DATA, SERVICES, AND FACILITIES TO BE PROVIDED BY THE CLIENT

The OIIPCRA project through their designated representatives would:

- a) Provide space for consultative meetings. It is expected that the consultant team will be in close and constant touch with the client and his designated team during the period of the assignment. The space will be provided to facilitate the interaction and review of this assignment.
- b) Provide available data and information that would be relevant to carry out the assignment.
- c) Help, identify, contact in the project areas, when required, and facilitate consultation with agencies potential project beneficiaries and others. Would help establish contacts in the project areas and facilitate consultation with agencies. The consultant would be responsible for contacting the concerned Construction Engineers and synthesize and analyze the information available.
- d) Make available copy of World Bank Operational policies and guidelines relevant to the needs of the agency.
- e) Provide a copy of Project Implementation Plan, Project Technical Manual and

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other relevant project related documents

- f) The Consultant would get support of the Project Team throughout the assignment period. The Consultant would be responsible for all transport and accommodation at project sites and in zonal headquarters. All requirements regarding the Data Services and facilities will be informed to the OIIPCRA well in advance. The consultant would be extended support by the project team at the Zone, District as well as at the SE level.
- g) If the consultant desires, then Executive Engineer (s) in its jurisdiction, will provide space for parking of MQCL for field visit.

8.0 QUALIFICATIONS OF THE CONSULTANCY FIRM AND KEY PERSONNEL:

- a) The consultant firm should have prior experience in monitoring similar QC & QA work in civil engineering project in wide geographical spread.
- b) The consultant firm having experience in external aided projects is preferred.
- c) The Consultant is expected to mobilize logistic in terms of hiring of vehicles and identifying the base laboratory to carryout tests as envisaged in the assignment.
- d) The consultant firm having experience in technical audit in Irrigation sector is preferred.
- e) The agency should be a registered legal entity in India with at least 5 (Five) years of institutional experience of working in Odisha (should attach the incorporation/ registration certificate and list of Board of Directors, office address details etc.);
- ~~f) Should not have been blacklisted by any Department of Government of India or Government of Odisha at the time of submission of RFP and also before awarding the contract;~~
- g) Should have an Annual Financial Turnover of at least Rs 100 Lakh (Hundred Lakh) in three preceding years (should furnish three years audited statement of accounts);
- h) Should have worked in World Bank financed/Externally Aided projects in India;

8.1 LIST OF KEY PROFESSIONAL POSITIONS WHOSE CV AND EXPERIENCE WOULD BE EVALUATED (LIKELY STAFF INPUTS)

The Consultant will provide a team of experts with the following skill sets who shall be adequately qualified and experienced in both Civil Engineering Construction management, quality control involved in it and related field to satisfactorily and timely deliver the expected outputs.

a. TEAM LEADER

- i. He shall be a Post graduate in Civil Engineering and possess 20 years' experience in Construction Management of irrigation projects and having experience in supervisory position in the rank of Chief Engineer under the

state Govt./ Central Government/ equivalent position in the irrigation projects/ organization the person served.

- ii. Experience of managing multidisciplinary teams is essential.
- iii. Past experience QC & QA for external aided project will be preferred.

b. TWO SPECIALISTS (EXPERT) IN CIVIL WORKS/ CONSTRUCTION MANAGEMENT.

- i. They shall be graduates in civil engineering and possess 10 years' experience in Construction, Quality Control and Quality Assurance of Irrigation Works.
- ii. Should have relevant experience in construction of earthen dam/ dyke/ embankment and hydraulic structure/ canal lining work.
- iii. Past experience in external aided project is preferred.

c. TWO SITE ENGINEERS (TESTING AND QUALITY CONTROL OF CONSTRUCTION MATERIALS)

- i. They shall be graduates in Civil Engineering and possess 5 years' experience in Soil & Concrete testing and Quality Control.
- ii. Should be conversant with testing in laboratory and field testing in irrigation works.
- iii. Past experience of having conducted experience in Minor Irrigation work is preferred.

d. THREE LABORATORY TECHNICIANS (TWO FOR MQCL FIELD TESTS & ONE IN BASE LAB)

They shall be a Diploma in Civil Engineering and possess 3 years' experience in Quality Control and Quality Assurance Works. They should be conversant with the testing in laboratory and field testing works. Past experience in Irrigation work is preferred.

11.0 DURATION OF THE ASSIGNMENT

The total expected duration of the assignment is 4 (four) years from the date of signing the contract.

12.0 COMMUNICATION ADDRESS

The Expression of Interest to be submitted by speed post/Courier to the following address;

Project Director, OCTDMS
7th Floor, Rajiv Bhawan,
Bhubaneswar-751001
Ph: 0674-2391363/ email: spuoiipcra.od@gov.in

13.0 Appendix : List of QC/QA equipment & MQCL illustration to be demonstrated.

MOBILE QUALITY CONTROL LABORATORY (MQCL)



Inside View Of Mobile Quality Control | Laboratory

FULLY FUNCTIONAL MOBILE QUALITY CONTROL LABORATORY (MQCL)

Inside View



For ILLUSTRATION

sdg₂₀₀

non-nuclear soil density gauge

- Full color graphics driven user interface, 480x640 VGA touch screen display with LED backlight for easy visibility.
- New Status Bar Feature, Displays GPS status, battery voltage, low battery and date and time.
- Rugged new case design made from .090" 5052 aluminum, powder-coated gloss black with green reflective vinyl graphics increasing driver awareness to road workers at night.
- New Data Management Feature, quickly access, download or delete your project data.
- Ability to upload and download files to the SDG via USB drive
- Fast, reliable, accurate and repeatable readings in real time, User friendly, in-process, cost effective tool for any crew member
- And most important, Non - Nuclear means No Badges or Licenses and No storage or transport concerns



Designed with
Windows
Embedded CE™

next
generation
gauge

For ILLUSTRATION



non-nuclear
soil
density gauge

specs

OPERATIONAL SPECIFICATIONS:

Measurement Mode:

- **Average** : Averages five (5) readings and stores data including location, date and time. Stores infinite records.

Functions:

- Wet & Dry Density, % Compaction, % Moisture

Soil Specifications:

- Designed to operate with standard soils used in civil Construction projects.
- Requires inputs from standard
 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (ASTM D4318)
 - Particle Size Distribution (ASTM D422)
 - Proctor Test (ASTM D698 and D1557)

MECHANICAL SPECIFICATIONS:

- **Unit Weight** : 14.2lbs (6.44kg)
- **Unit Dimension** : 11in x 11in x 12in (27.9cm x 27.9cm x 30.4 cm) with handle extension 29in High (73.6cm)
- **Shipping Weight w/Case** : 42.5lbs (19.27kg)
- **Shipping Dimensions** : 24in x 19.5in x 14in (60.9cm x 49.5cm x 35.5cm)

MEASUREMENT SPECIFICATIONS:

- **Sensing Area**: 11 in. (27.9mm) diameter base allows optimum measurement on fine and coarse material types.
- **Measurement Depth**: Designed for use on a standard 12" (30cm) un-compacted layer of soil during or after compaction.
- **Measurement Display**: Dry Density, % Compaction, % Moisture, GPS Data, Material information and Project Name

ELECTRICAL SPECIFICATIONS:

- **Microprocessor Controlled**
- **CE Mark** : Complies with EN61000 - 4-2, 61000 - 4-3, 61000-4-8
- **Battery**: 14.0 Amp-hr NiMH, 7.2volt
- **Recharge Time**: 4 hours
- **Battery Charger** : Self Contained CE & UL Certified Universal AC charger, DC Charger
- **Computer Ports**: 1 USB Port

OPERATIONAL FEATURES

- **Display**: Full color graphics driven user interface, 480x640 VGA touch screen display with LED backlight for easy visibility in daylight or dark situations.
- **Status Bar**: Displays GPS status, battery voltage, low battery and date and time.
- **Project Details**: Stores up to 20 projects with details
- **Material Details**: Stores up to 20 materials, details include Material Name, Description, Max Dry Density, Opt. Moisture Dry Density Offset, % Moisture Offset, % Greater than 3", % greater than 3/4", % Gravel, % Sand, % Fines, PL, LL, Cu and Cc
- **Date Logging**: Ability to store all measurements
- **Reports** : Easily download data to be imported into Excel
- **GPS Control**: When activated will display latitude and longitude positions, number of satellites the gauge is connected to as well as the UTC date and time, also available in UTM format. GPS information will store with each measurement when Data Save feature is enabled. (Status Bar Icon)
- **Update Software**: One touch upload of new software using a USB memory stick.
- **Data Management**: Quickly access, download or delete your project data.
- **Set Time & Date**: Quick time and date setup, MM/DD/YY and DD/MM/YY formats.
- **Units**: Interchangeable settings for Density (kg/m³, lb/ft³), Temp (°C, °F)
- **Standardization**: While gauge is still in the case, a quick one touch measurement will insure the gauge is still in proper working mode.
- **Calculator**: Built in four function calculator
- **Enhanced customer support**: Diagnostic screen to aid in factory support.
- **User Programmable Target Density**: Used for calculating % compaction.
- **User Changeable Batteries**: easily change batteries in the field.

WARRANTY:

- **Standard** : 12 Months
- **Optional Extended Warranty**: Customer CarePlan available, contact Trans Tech or your local authorized distributor.

FUTURE OPTIONAL ACCESSORIES

- Stand Alone Charger, Extra Battery Packs & Printer

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• CONTACT FOR SPECIAL EXCHANGE OFFER FOR THE NUCLEAR GAUGE WITH NON NUCLEAR SOIL DENSITY GAUGE / PAVEMENT QUALITY INDICATOR*

* CONDITIONS APPLY

For Illustration

COLEBRAND LOGGING COVER METER

Features:

The many features include:

- Scanning for minimum cover which allows the user to find the minimum cover automatically.
- Automatic surveying — a preset minimum value is entered into the data logger and the head is scanned over the concrete surface, all values less than the preset minimum are recorded automatically.
- Minimum cover alarms — whenever the depth of concrete cover above the rebars falls below a value preset by the user, an audible alarm signal is given.
- Traveller to carry a search head which automatically measures and logs the distance between cover readings.

Data Handling:

When a survey is completed the data can be printed out on site using any standard bubblejet, portable printer (Colebrand recommends the Diconix printer). An example of data printed out on a Diconix printer: The readings show the depth of concrete cover above the rebars in mm.

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o FILE NUMBER 010
o 024 037 034 027 034 036 025 049
o 033 037 030 039 044 039 036 029
o 035 045 047 041 047 038 029 038 038 036 036 037 041 041 042 011 017 011
o 036 043 038 032 040 051 036 042 037 024 030 027 034 036 028 006 022 014
o 035 043 038 030 033 045 039 046 032 027 038 036 027 036 025 018 018 010
o 040 032 037 027 043 042 045 031 025 045 044 023 035 043 021 026 026
o
o FILE NUMBER 011
o 036 035 049 032 035 039 031 034 021 016 019 033 034 033 036 036 057 022 035 038 019
  
```

Sample printout from the Diconix printer, including spaces for nulls.

Also the data can be downloaded to any PC-compatible computer for archiving and analysis. Software and connecting leads are supplied with the Logging Cover Meter.

Specification:

Resolution:	Small head	1, 3, 5mm at 60mm depth
(concrete cover)	Standard head	1, 3, 5mm at 100mm depth
	Medium head	1, 3, 5mm at 140mm depth
	Large head	1, 3, 5mm at 200mm depth
Resolution:		10mm
(distance measurement)		
Range for	Small head	60mm
concrete cover	Standard head	100mm
measurement:	Medium head	140mm
	Large head	200mm

Calibrated for bar sizes up to 40mm, in both metric and Imperial bar sizes; to BS 1881 part 204.

Maximum distance measurable: 54cm

Memory, semi-permanent: 32 Kbytes

Serial interface: RS232
8 data bits
1 stop bit
no parity
1200 baud

Audio signal: 4mm jack plug on front panel; frequency increases as cover decreases.
Zeroing: Hold search head away from metallic objects and press Zero.

Range: High-tensile and mild steel bars in the following metric diameters: 6, 8, 10, 12, 16, 18, 20, 25, 32, 40mm.

Power: Four AA-size batteries, giving approximately 8 hours continuous use. Low battery warning given when approximately 2 hours' use remaining.

Packed dimensions: 460mm x 340mm x 160mm

Weight 6.0 kg
operating 0-45°C
storage -25-60°C
humidity 20-85% non-condensing

Contents of Kit:

Two search heads
Data logger
Cable (for connecting either search head to the data logger)
Cable (for connecting the data logger to the Diconix Printer, if ordered)
Cable (for connecting the data logger to a PC)
File transfer software
Spacer Block
Comprehensive user manual
Carry Case

Extras: Diconix Printer, Headphones, Calibration Block, Extension Stick (5m, telescopic stick to take all sizes of head), Traveller to measure the distance moved over the concrete surface as cover readings are taken, Directional Head, customised software.

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Colebrand is efficient and responsive to customer needs. If you have a specific requirement then please discuss it with us, we can adapt the software to meet your needs or design a special head. Colebrand also takes great pride in providing a thorough and complete after sales service.



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