



JHARKHAND URBAN INFRASTRUCTURE DEVELOPMENT COMPANY LIMITED

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Letter No: JUIDCO/REOI/TOR/CSQC/1324/2017- 1977

Date : 15-06-2017

REQUEST FOR EXPRESSION OF INTEREST (REOI)

Consultant for Construction Supervision and Quality Control support for the Jharkhand Municipal Development project (JMDP) in Jharkhand

***NAME OF PROJECT:* Jharkhand Municipal Development Project (JMDP)**

Loan No.: Applied for

Reference No. (as per Procurement Plan): **IN-JUIDCO LTD-16948-CS-QCBS**

The Government of Jharkhand, has applied for financing from the World Bank toward the cost of the Jharkhand Municipal Development Project (JMDP) and intends to apply part of the proceeds for consulting services.

The consulting services (“the Services”) include providing support to the Jharkhand Urban Infrastructure Development Company Ltd. (JUIDCO) to manage, execute and implement the JMDP Program components in the State of Jharkhand achieving quality results as per standards and timely completion of the project. The scope of the assignment shall include *Construction Supervision and quality Control support*, for a period of 36 months.

JUIDCO now invites eligible consulting firms (“Consultants”) to indicate their interest in providing the Services. Interested Consultants should provide information demonstrating that they have the required qualifications and relevant experience to perform the Services.

The shortlisting criteria are:

- Bidder should have successfully completed consultancy assignments of Construction Supervision, including at least one sub project which included water supply/drainage project and one subproject which included roads (atleast 5 km length) since 1-4- 2008. Bidder should have also undertaken construction supervision of either one project of value Rs.300 crore or atleast 2 projects each of minimum150 crores. Supporting certificates are required to be submitted. [60 marks]
- Average Annual Turnover in consulting assignments during last 3 financial years (FY 14-15, 15-16, 16-17) should be more than 10 crores. Audited financial statements shall be considered. [20 marks]
- Successful completion of construction supervision assignments of at least 2 projects funded by multilateral funding agency with total contract value of each contract not less than Rs. 4 Cr. Supporting certificates are required to be submitted. [20 marks]

Draft ToR for this assignment is available at juidco.com under tenders section and www.jharkhand.gov.in under notice section.

The attention of interested Consultants is drawn to paragraph 3.14 of the World Bank's Procurement Regulations for IPF Borrowers, *Procurement in Investment Project Financing Goods, Works, Non-Consulting and Consulting Services, July 2016*, setting forth the World Bank's policy on conflict of interest.

Consultants may associate with other firms in the form of a joint venture or a sub-consultancy to enhance their qualifications.

A Consultant will be selected in accordance with the QCBS method set out in the Consultant Guidelines.

Further information can be obtained at the address below during office hours.

Expressions of interest must be delivered in a written form to the address below (in person, or by post) by 03-07-2017 up to 4.00 PM.

Jharkhand Urban Infrastructure Development Company Limited

Attn: Project Director

3rd Floor, Pragati Sadan,

Kutchery Chowk, Ranchi,

PIN – 834001, Jharkhand, India

E-mail: juidcolimited@gmail.com

Sd/-

Dy Project Director

JUIDCO, World Bank, PMU

JHARKHAND MUNICIPAL DEVELOPMENT PROJECT (JMDP)
Construction Supervision and Quality Control Consultancy Services for
Jharkhand Municipal Development Project

Draft Terms of Reference

A.BACKGROUND

The Government of Jharkhand (GoJ) has applied for a loan from the World Bank for implementation of the proposed US\$300 million Jharkhand Municipal Development Project (JMDP) or the Project. GoJ will implement the proposed project as an AMRUT plus program open to all urban local bodies (ULBs) across the state. Investments identified based on city level demand providing comprehensive service delivery by complementing other programs and/or being strategic to the cities' economy and future growth will receive investment support under the proposed JMDP. All investments will be linked with relevant associated reforms. Investment selection will aim at building a system of providing city-level basic urban services versus providing support to select areas that come up as islands of excellence. Focus will be on working with ULBs to help them manage and maintain these services efficiently. GoJ is also focused on reforms and institution building by deepening select AMRUT reforms and widening them to new areas which have the potential to become the catalysts of change in the way urban institutions are set-up, govern and manage their mandates. The focus will be to work with the basic building blocks of the institutional set-up and build an urban local governance system starting with fundamentals of policy reforms, setting up systems and strengthening institutions covering resources, capacities and accountabilities.

Component 1: Urban Infrastructure Improvement. The component will finance: (i) improvement of municipal infrastructure (including expansion of coverage, and construction and rehabilitation of basic infrastructure systems in participating ULBs; and (ii) operation and maintenance (O&M) support on a declining basis, where relevant. Investments under this component will address deficiencies in basic urban services including water supply, sewerage/wastewater, drainage, roads, solid waste management, parks, among others.

Component 2: Policy and Institutional Support. This component will aim at strengthening the overarching local governance architecture in the state setting up systems and strengthening institutions covering resources,

capacities and accountabilities. This will be done through two subcomponents: (i) policy and institutional support to state agencies that will look at identifying and overcoming functional gaps and multiplicities at state-level urban institutions, and building institutional capacities of key state institutions aiming to create stronger urban governance architecture in the state; and (ii) strengthening ULB revenue base and public financial management systems that will look at strengthening the revenue base of ULBs to create greater autonomy for local government institutions, and institutionalizing sound public financial management systems in ULBs towards achieving improved creditworthiness and long-term sustainability of proposed Project investments.

Component 3: Project Management and Technical Support. The component will finance: (i) project management, construction supervision, and implementation support to Jharkhand Urban Infrastructure Development Corporation (JUIDCO) and ULBs; (ii) preparation of priority detailed project reports (DPR); and (iii) incremental operating costs of JUIDCO, including equipment.

JUIDCO will have the primary responsibility for overall Project implementation and ensuring that Project objectives are achieved. It will be directly responsible for implementation of Component 1 and Component 3, including all procurement, financial management and safeguard activities. A Project Management Unit (PMU) will be set-up within JUIDCO. The Urban Development and Housing Department (UDHD) will be directly responsible for implementation of Component 2. In addition to the PMU, JUIDCO will set-up Project Implementation Units (PIUs), who jointly with the PMU will be responsible for implementation supervision at the ULB/investment level, as well as for providing O&M quality assurance support to ULBs. JUIDCO will procure a Project Management Consultant (PMC) to support the PMU for meeting all project management requirements of the proposed Project.

ULBs will identify priority subprojects based on in-city exercises and pose the same for investment support under Component 1 to JUIDCO for consideration. JUIDCO will undertake an initial screening of all such proposals, and qualifying ULBs will be asked to initiate preparation of feasibility reports, detailed project reports (DPRs), safeguard documents, bid documents, etc. Given capacity and/or resource constraints at ULB level, ULBs can request JUIDCO to hire consultants to prepare the subproject investments on their behalf. So far, ULBs whose proposals

have qualified the initial screening have requested JUIDCO to prepare subproject investments on their behalf.

JUIDCO has procured a set of consultants to prepare these subprojects; the same consultants will also provide project management and construction supervision support during works implementation at the ULB level. However, given the extended requirements of construction supervision for multilateral agency supported projects, including safeguards, grievance redress, etc. it is proposed that a Construction Supervision and Quality Control (CS&QC) consultant will also be procured by JUIDCO to provide support at the PIU/investment level. A list of indicative subprojects identified as on date which are likely to be considered for investment support under Component 1 is included in Annex 1.

B. OBJECTIVE OF THE ASSIGNMENT

JUIDCO intends to procure services of a Construction Supervision and Quality Control Consultant (hereinafter called the 'Consultant'). The Consultant will support JUIDCO in construction supervision and quality control during implementation of the proposed subprojects under Components 1.

C. SCOPE OF SERVICES

The overall scope of services of the Consultant will include the following:

The Consultant will support JUIDCO PMU and its PIUs in implementation of Components 1 by providing supervision of works being executed and ensuring quality control. This shall include review of the effectiveness of the construction management procedures being adopted by the contractor, quality assurance and construction supervision arrangements put in place by the Contractor, and recommend effecting appropriate improvements/actions; Ensuring the works done are as per agreed schedules and as per agreed quality standards; Providing day to day supervision through site visits, attendance at site meetings, review of measurement of works, and review of certification of payments to contractors; and Ensuring that the provisions of the social and environmental safeguards are duly complied by the Contractor during implementation.

The Consultant's team will be based primarily in the field and concerned PIUs. PIUs will provide on-ground execution supervision, safeguard supervision, and project coordination support to JUIDCO.

The assignment will require around 450 person-months for 36 months (2017 to 2020) with a possibility of another 36 months of extension (2020 to 2023) for

around 450 person-months based on Consultant performance and Project requirements.

D.DETAILED SCOPE OF WORK

The Consultant shall:

1. Exercise and perform all the duties liabilities, functions and obligations as laid down with reasonable skill, care and diligence and ensure that the works are executed at site strictly as per the approval granted by Juidco/concerned local authorities, the terms and conditions of the Contract Agreement entered between Juidco and the respective contractors within the given time frame and budgeted provisions.
2. Supervise of entire works at site, taking measurements, preparation/checking and certifying contractor's bill.
3. Carry out a scrutiny/technical audit of the reports, drawings, designs, estimates, BOQ etc. prepared by the contractor such as progress reports, site surveys, evaluation and analysis including soil investigation, structural design, design of internal and external services, sanitary, plumbing, drainage, water supply, sewerage internal roads, electrification works etc., as the case may be based on the details available in DPR/ approved by JUIDCO and as per the site conditions. Advising JUIDCO on Acceptance/rejection of reports/ documents.
4. Carry out day to day supervision of execution of construction works at site, quality control, progress monitoring, taking measurements, certifying quantities on the Contractor's claim.
5. Prepare quality assurance and quality control plan which should include inspection and test plan for construction materials, and ensure that the approved quality assurance and quality control plan is being followed by the contractor.
6. Ensure measurement of all items having financial value in the measurement book and/or level filed book at all times so that a complete record is obtained of all works performed under the contract.
7. Advise JUIDCO at site on specific problem/issue related to quality of construction /erection, as & when such problems are detected & brought to the notice. Bringing instances of non-conformity to the notice of JUIDCO with regard to non-compliance of construction parameters e.g. materials, workmanship, specification.

8. Develop necessary instruction/sketches in case of inadequacy in drawings/specification detected or where it is necessary to elaborate on design due to variation of site/soil condition in consultation with PMC/JUIDCO as required along with cost variations.
9. Providing timely recommendations on variations/ cost estimates and change orders as required along with justification and analysis of rates as required so as to avoid any delay in execution.
10. Prepare detailed PERT/CPM and other chart analysis of various project related activities regarding time frame, resource allocation & scheduling etc. using latest techniques including developing MIS for approval.
11. Apprise JUIDCO on any delays along with recommendation on mitigation measures and cost implications. Provide recommendations on requests for time extension made by the Contractor.
12. Suggesting/ Recommending approval of international / alternativestandards, (in case Indian standards are not existing for some work) to be adopted by the Contractor.
13. Assess adequacy of various infrastructures (water, labour camp, testing facilities, power, storage, etc.) set up at site by Contractor for proper mobilization of works. Reviewing Contractor's proposal and monitoring actual arrangements for security, safety of site, gate control, medical care, emergency preparedness, emergency response, on-site safety training of employees, safety during demolitions, fire prevention etc.
14. Recommending for issue of Completion/Operational Acceptance Certificate to the Contractor within specified time after completion of tests on commissioning/ defect liability. Verifying whether after receipt of Completion/ Operational acceptance certificate, the Contractor has cleared away & removed from site all his equipment (no longer required), surplus materials, wreckages, rubbish & temporary structures & whether the site's facilities are in clean & safe condition.
15. To verify during clearing & grubbing operation on worksite by Contractor that these are minimum practically necessary to construct the works & also to verify that trees & other vegetation designated for preservation are not getting damaged & are fully protected.
16. Recommending after proper determination of costs analysis of completing any urgent unforeseen works if required (such as bunds for protection from floods, securing water source etc.) related to the project, in the event of Contractor's delay/unwillingness/inability.

17. Review & recommend for approval Contractor's Quality Assurance Procedures & Documents.
18. Verifying & certifying the setting out of works of Contractor in relation of benchmark, reference marks & lines to ensure correct position, level or alignment.
19. Verify "as built" Design –Build documents and drawings. Provide JUIDCO a list of all necessary warranties which need to be handed over by the contractor.
20. Ensure that utility shifting has been done and other facilities such as sign boards are restored by the contractor as required. Verification of exploratory excavation by the Contractor for checking the exact position/location/co-ordinate of the existing services & verification of adequacy of arrangements made by the service provider for any diversion or removal of services required.
21. Verifying adequacy of safeguards being provided by the Contractor to pipes, cables etc. and ensure that Contractor adopts methods which pose least possible interference to existing amenities.
22. Verifying whether all water and waste products from the sites are getting discharged as per applicable regulations.
23. Analyze project execution schedules submitted by the Contractor for its feasibility and whether it is in line with the overall project schedule.
24. Attend progress review meetings called by JUIDCO PMU and PIUs and submit updates if required on project progress and issues.
25. Recommending the approval of the measuring instruments, indicators, calibrations & other apparatus to be used for carrying out tests/inspections & also approving the Test schedule, detailed test procedure & method statement. Attend tests or inspection either at any part of the project/ worksite or at place of installation & place of manufacture, as the case may be. Approving the type & number of performance & operational tests for demonstrating compliance of the installations with output requirements. Countersigning Contractor's Report of every Test/Inspection after witnessing tests/inspections.
26. Witnessing Contractor's demonstration for proper functioning & operation of all mechanical & electrical equipment's with design & specification both individually & as part of the system. Witnessing each process, each of auxiliary equipment's, distribution system & systematic completion of plant for pre-commissioning.

27. Witnessing the Contractor's demonstration of ability of the systems such as water supply systems to meet functional guarantee for treatment plant, storage & distribution system & witnessing the completion of tests (for assessing performance of the facilities with respect to the following criteria a) Raw water composition b) Treated water composition c) power consumption, d) consumption of chemicals) over required period of continuous operation immediately after completion of pre-commissioning. Verification whether the plant could be operated in accordance with the Operating Manual & whether the plant output could be varied over full operating range. Obtaining the results & analysis with all other data collected from the Contractor & review the same.
28. Verify whether the Contractor is collecting samples for testing from locations identified in the works & in the field & whether the collected samples only are subjected to analysis.
29. Scrutinize the Plant Modification proposal prepared by the Contractor, in case of failure of performance test, & approve the same after required improvement. Witnessing the modification work during implementation stage & witnessing the repeat guarantee test by the Contractor.
30. Reviewing Structural Soundness Reports cum certificate produced by the contractor and if required provide independent structural soundness certificate to facilities.
31. In order to ensure the due compliance, the CSQC shall take the actions, described in Section D5 below, with respect safeguards;
- Reviewing the implementation of EMP by the Contractor and suggest suitable measures for strengthening, including training of staff, strengthening of monitoring systems, dedicated staff at site, and involvement of local communities.
 - Identifying regulatory requirements of sub-projects from Go and GoJ and monitor their compliance by the Contractor at all stages of the project.
 - Maintaining a data base/excel sheet in a standard form, on the status of various environmental activities of the sub-project during execution (clearances, compliances, etc.)
 - Coordinating with the PIUs, Environmental Engineers of Contractor and provide necessary supervision in implementing EMPs, guidance in securing regulatory clearances on Environment and other agencies.

- The Environment Health and Safety Engineer will inspect work sites, camps and quarries for checking compliance with EMP EHS specifications, national and local laws and regulations.(atleast once a week)
- **Complaint Handling:**If complaints will be received by the Contractor's Site Office from local residents with regard to environmental infractions such as noise, dust, traffic safety, etc. Responsibilities for processing, addressing or reaching solutions for complaints shall be belong to the Contractor's Engineer or equivalent, and the JUIDCo PIU. The EHSE shall shall confirm that they are properly addressed by the Contractors in the same manner as incidents identified during site inspections.
- **Unforeseen Impacts:** In the event that an incident arises which was not foreseen in the EMP or EIA, the EHSE shall work closely with the Contractors team, and EHSE in the contractor's team to confirm satisfactory resolution to the incident, and subsequently update the EMP and the implementation guidelines.
- **Monthly Payments EMP:** The EHSE shall confirm the monthly payments for environmentally related activities.
- **Site Restoration:** The EHSE shall closely monitor all activities with regard to siterestoration, specifically the borrow pits, camps, etc. The EHSE will agree with the Contractor on a site decommissioning and restoration plan to be implemented before the completion of the construction phase and prior to handing over the site/plant.

E. REPORTS AND DELIVERABLES

List of Report and Schedule of Deliveries. The CSQC shall prepare the reports listed below, in English and complete digital files in a format and manner acceptable to JUIDCO. Reports would be prepared initially in draft and submitted in 5 copies, and finalized within two weeks following receipt of comments from JUIDCO; these would generally be provided within one week of receipt of the draft report and submitted in 5 copies. All documentation and outputs will also be provided in soft copy digital format together with a PowerPoint presentation, suitably protected and accessible on a restricted hierarchy basis.

(a) **Inception Report (IR):**The draft IR shall be submitted within 2 months after commencement of assignment. The IR shall inter alia include approach to the

assignment, objectives, quality assurance plan, detailed methodologies and work plans in respect of each activity, schedule of activities, detailed time-task – schedule listing all tasks, mobilization plan, anticipated difficulties including staffing problems that have become apparent, deficiencies in Client assistance, and bring to Client’s attention major problems that could affect the direction and progress of the work;

(b) Quarterly Reports (QR): The draft QR shall be submitted within two weeks from the end of the quarter for which the report is submitted. The QR shall include, inter alia, progress of work, team mobilization, tasks undertaken, partial results, meetings held, planning of activities for next quarter, updated works schedule and staff mobilization plan, status of physical progress of various investments; recommendation on contractor’s performance wrt to agreed schedule for implementation, report on implementation of EMP by the contractor, difficulties encountered, assistance required. Copies of all interim reports produced during the quarter being reported will be included as annexures. The report shall cover details on bills raised by the Contractors & payments made. The report shall also cover the manpower deployment against the planned deployment with a report on required augmentation in manpower, equipment’s, and resources. Constraints faced, if any, shall be highlighted.

(c) Completion Report for ‘Design and Build’ Contracts: Within 2 months from completion of a works contract, a report shall be submitted providing: (i) comments on variation in concept of design and implementation with respect to conceptualized in DPR; (ii) complete and systematic account of the contractor’s performance, and (iii) recommendations for improvement in design, procurement and implementation of similar future works, including a report on successful commissioning, lesson learnt from the experience (iv) status of preparation of as – built drawings, its availability & soft copies of As-built drawings in UD&HD e-Archives, (v) Final Report: The completion report of the CSQC providing the details of overall work progress and final documentations.

(d) Reporting on EMP compliance:

Weekly report on EMP compliance	At beginning of every week, throughout site preparation, pre-construction, construction and site restoration
Monthly report 1. EMP compliance	At the beginning of every calendar month, throughout site preparation, pre-construction, construction and site restoration

<ul style="list-style-type: none"> 2. Environmental Monitoring 3. Reporting on Accidents, worker safety 4. Construction and Worker camps 5. Traffic Management 6. Complaint Handling 7. Trainings to Workers/ project staff 8. Analysis of safeguard Implications of any design/alignment changes. 	
<p>Chance Find report (if/ when applicable)</p>	<p>Within 24 hours of finding the archeological relic, remain or artifact.</p>
<p>End of Project report</p>	<p>At the end of the project the EHSE shall prepare a final report summarizing the key findings from their work, any non- compliances, resolutions, etc. as well as advice and guidance for how such EMPs should be conducted in the future.</p>

F. FACILITIES TO BE PROVIDED BY CLIENT

JUIDCO will make the following available to the CSQC:

(1) Access to project sites and all available relevant previous studies, reports, documents (by the DPR consultant and the contractor) and contracts related to the Project on request by CSQC. The CSQC shall in turn, verify the relevance & correctness of the data/information provided by the Client and satisfy themselves about the accuracy of data/information/material before these are used by them. Data/information /material /documents provided to the CSQC shall remain the property of the originating agency and shall be provided solely for the purpose of the work to be done under this contract. All such borrowed material shall be returned to JUIDCO upon completion of the assignment. Apart from data/information /documents provided by the JUIDCO and that which the CSQC could procure from other agencies, the CSQC is responsible to collect any other data/information required for the assignment, through field survey and investigations;

(2) Assistance with arranging meetings with local Government officials and other Governmental authorities as necessary during the course of the consultant’s work.

G. FACILITIES TO BE PROVIDED BY THE CSQC

The CSQC shall establish its own office facilities at at project sites and provide its own equipment (vehicles, survey equipment, office and computer equipment,

telecommunication and document printing and reproduction systems, etc.) and staffing suitable for performance of the services under the assignment. Any equipment or any other item purchased under the CSQC contract shall have to be turned over to JUIDCO at completion of the assignment in an acceptable working condition. The CSQC shall make own arrangement for travel/stay for performing the assignment.

H. INSTITUTIONAL AND ORGANIZATIONAL ARRANGEMENTS

The CSQCTeam Leader shall report to the JMDP Project Director or JMDP Deputy Project Director as instructed.

I. DURATION OF THE ASSIGNMENT, AND INDICATIVE INPUTS

The assignment will be for a period of 36 months, extendable by another 36 months depending on performance of the Consultant and Project requirements. The performance of the Consultant will be formally evaluated after 30 months to assess if the Consultant's contract period should be extended or not.

J. KEY PROFESSIONAL WHOSE CV's WILL BE EVALUATED

Team Leader and Program Manager: Master's degree in Environment/Structural/Civil Engineering and a minimum of 15 years of proven track record in construction supervision of infrastructure projects, and experienced as Team Leader for a minimum of 2 number projects of complexity of the proposed assignment. Experience in management of multilaterally funded project is essential. He/she will coordinate with the client, review the relevant data, reports, and deliver presentation on the outputs/deliverables/reports and execute work plan to deliver the project on time and to the satisfaction of client, among other things.

Deputy Team Leader/Contracts Manager: Bachelor's in Civil Engineering and preferably with an additional master's degree /diploma in construction management. He/she should have at least 10 year's professional experience in major civil engineering construction activities and handled at least one large value ICB project constructed using the FIDIC Conditions of Contract, in a similar capacity. Knowledge and experience of modern construction technology including the use of and productivity levels of plant and equipment and construction management methodologies, practices, tools and techniques appropriate for major civil engineering construction are essential. He/she should

be familiar with the safety practices and implementation aspects of environmental management plans.

Electro-Mechanical Engineer: A mechanical/ electrical engineer with a minimum of 7 years of proven track record in the design and rehabilitation of water and wastewater systems comprising pumping machinery, electrical panels, sewage pumping stations and sewage treatment plants. He/she will review the reports on condition assessment of the existing sewerage infrastructure, the program for rehabilitation and any other technical reports prepared by design consultants, as necessary. He shall also be responsible for quality management of mechanical and electrical equipment in wastewater treatment installations within the scope of the construction supervision and quality control, among other things as assigned by the Team Leader.

Safety Officer: A graduate with Diploma in Occupational Health and Safety with a minimum of 10 years working experience in area of Occupational Health and safety and with experience working in at least one project financed by the World Bank or by another international finance institution.

Environmental Management Specialist: Master's degree in Environmental Sciences/Engineering/ Management with a minimum of **10 years** with a strong preference for good technical training and experience in environmental management related to large scale civil engineering or urban infrastructure projects in Water Supply, drainage, Sewerage and Roads. The candidate should have worked at least in one World Bank financed project and familiar with the environmental safeguards requirements of projects financed by the World Bank. Experience in the design, implementation, and monitoring of environmental projects, conducting environmental studies, analysis and the preparation of EIA reports. particularly in the fields relevant to this position. He/she should be conversant with the present environment legislative and institutional issues, existing laws, and be responsible to review environmental assessment and environmental management plan, and supervision of implementation of environmental management plan, among others.

Design Engineer: The Design Engineer should have a Post-graduation in Structural Engineering, with at least 10 years of experience in designing of infrastructure projects. The person should be able a.) to provide recommendations on minor changes in the drawings because of site conditions and local issues b.) review designs and drawings submitted by contractors and provide recommendations to

the client c.) assist client in decision making to ensure structural stability of project components.

Quantity Surveyor/ Billing Engineer: The quantity surveyor must have an Engineering degree (graduate) in Civil Engineering, a post-graduation is desirable with at least 10 years of experience in billing in construction projects. The person should be well-versed with measurement and documentation of executed quantities in measurement books, so that it is easily understood by the reviewing authority.

Quality Control Engineer: Bachelor's degree in Civil Engineering or higher in engineering and a minimum experience of 8 years in developing quality management system and quality management of civil engineering structures including testing of materials. Knowledge and experience of modern construction technology appropriate for major civil engineering construction will offer advantage.

Number of Key Professionals

Sl. No.	Key Staff	Suggested Number (JUIDCO to decide)
<u>1</u>	Team Leader and Program Manager	
<u>2</u>	Deputy Team Leader/Contracts Manager	
<u>3</u>	Electro-Mechanical Engineer	
<u>4</u>	Safety Officer	
<u>5</u>	Environmental Management Specialist	
<u>6</u>	Design Engineer	
<u>7</u>	Quantity Surveyor/ Billing Engineer	
<u>8</u>	Quality Control Engineer	

Annex-1

Sr. No.	Name of the Project/ Consultant	Sector	Estimated Cost (INR Crores)
1	Deoghar Strom water Drainage	DRAINAGE	62.00
2	Dhanbad Drainage System	DRAINAGE	215.00
3	Hussainabad water supply scheme	WATER SUPPLY	38.99
4	Khunti Water Supply Scheme	WATER SUPPLY	57.25
5	Dhanbad Road	TRANSPORTATION	373.00