

**GOVERNMENT OF ORISSA,
DEPARTMENT OF WATER RESOURCES,
INVITATION FOR EXPRESSION OF INTEREST
Identification No.PMU-07/2011-12 dated 02.12.2011.**

Loan 2444-IND / OFID Loan 8240-IND: Orissa Integrated Irrigated Agriculture and Water Management Investment Programme (OIIAWMIP), Project-1.

Expression of Interest for Survey and design of canals and structures on main and distributary canals of Pattamundai, Machhagaon, High Level Canal R-1 and Kansbahal.

1. The Government of Orissa through the Water Resource Department is implementing the Orissa Integrated Irrigated Agriculture and Water Management Investment Program (OIIAWMIP) under ADB's Multitranche Financing Facility. The investment program, aims to reduce rural poverty levels in the State by improving agriculture sector productivity and enhancing rural incomes. Resources under OIIAWMIP will be available tentatively in four tranches for projects located in northern and eastern parts of the State. Implementation of Project 1 under the first tranche is ongoing.

2. Department of Water Resources Government of Orissa is the Executing Agency for the aforesaid project. The Project Management Unit (PMU) under DoWR, Government of Orissa intends to utilize part of the proceeds of Project-1 for payment for Survey, Design and Related Services for main and distributary canals and structures on the Pattamundai, Machhagon, High Level Canal R-1 and Kansbahal sub-projects for their execution in Tranche-II. For additional information on the program and the separate sub-project request for Eol notices please visit website: www.dowrorissa.gov.in and <http://cms-csrn.adb.org>.

3. For the above purpose, the Chief Engineer-cum-Project Director (PD), Project Management Unit (PMU) invites applications from reputed national Firms/Consultants to submit their 'Expression of Interest'.

4. There are four sub-projects. The Consultants/Firms should submit separate Eols for each sub-projects in individual sealed covers they are interested in bidding. Details of the four sub-projects are summarised below:

Sl.	Sub-project	Length of main and distributary canals	No of new or reconstructed structures	No of structures to be renovated	Estimated cost of services including service taxes
1	Pattamundai Main & Disty. Canal	160km	26	635	INR 9.12 million
2	Machhagon Main & Disty. Canal.	240km	26	978	INR 8.39 million
3	High Level Canal R1 Main & Disty.Canals.	113km	46	295	INR 7.77 million
4	Kansbahal Main/ Disty. Canal.	29km	16	91	INR 1.78 million

The services to be undertaken at each scheme include: (i) topographic and condition survey of the canals and associated structures; (ii) limited geotechnical investigations; (iii) detailed design and preparation of drawings for new/rebuilt structures and those identified for major repairs; (iv) preparation of drawings, BoQ, engineer's estimate and tender documents.

5. Consultants may submit their 'Expression of Interest' in joint venture with other Consultants or a consortium of firms to comply with aforesaid requirements. All consultants and experts must be from ADB member countries and be eligible to participate in ADB financed projects under the provision of ADB's Procurement and Consulting Guidelines.

6. Interested Firms/Consultants should submit separate amplified “*Expressions of Interest, EoI*” which contain the following information for each of the sub-projects they are interested in bidding in the prescribed format of the EoI:

- i Consultants Profile and Registration
- ii Project Experience in last 3 years
- iii Consultant's Professional Personnel
- iv Financial Statements of the Firm/Consultant in last 3 years

7. The Consulting Firm/Consultant will be selected and engaged under Consultant's Qualification Selection (CQS) procedures in accordance with the guidelines on the Use of Consultants by Asian Development Bank and its Borrowers (April 2010). Selection of a Firm/Consultant shall be decided on the basis of the EOI and the only selected Firm/Consultant will be asked to submit a combined technical-financial proposal in prescribed RFP and then invited for contract negotiation.

8. The submitted amplified EoIs will be evaluated in accordance with the criteria mentioned in ToR. Only the Firm/Consultant that submitted the highest ranked EoI will be invited to submit a technical and financial proposal. The technical proposal will confirm the professional staffing given in the amplified EoI (or propose equivalent or better staff), as well as providing a methodology statement and work plan with detailed schedule to complete the assignment. The financial proposal will state a lump sum amount for the assignment substantiated by staffing costs and expenses. Subject to a satisfactory technical proposal contract negotiations will be initiated and, if successful, culminate in contract signing.

9. Interested Firms/Consultants may obtain more information, by attending Pre-Submission Meeting to be held on **15 December 2011 at 11 A.M.** in the Conference hall of the office of the Chief Engineer-cum-Project Director, PMU (OIIAWMIP).

10. The sealed Expression of Interest are to be submitted in the sealed tender box kept at either of two addresses indicated below, in hard and soft (electronic-CD) copy by **03 January 2012 up to 1:00 pm** during office hours. The name of the sub-project shall be clearly indicated on the outer envelope. Any EoIs received late through post will not be considered for opening (the Department will not be responsible for any lapses or delays in postal delivery). The Expressions of Interest so received shall be opened on **03 January 2012 at 4:00 pm** in the office of the undersigned in presence of the Firms/Consultants or their authorised representatives, who wish to attend. In the event of the office being closed on the last date of submission and opening of Expression of Interest (EOI), the EoIs will be received and opened on the next working day at the same time and same venue.

- a Chief Engineer-cum-Project Director, PMU (OIIAWMIP),
Department of Water Resources, Govt. of Orissa,
5th Floor, Rajiv Bhawan, Bhubaneswar- 751001, Orissa, India.
E-mail: cepdpmu@gmail.com
Tel: +91- 674- 2391475, Fax: 0674- 2391459.
Tel: +91- 671- 2301030
- b Superintending Engineer,
Eastern Circle, Cantonment Road, Cuttack – 753 001, Orissa, India.
Tel: +91-671-2301030, E-mail: seecuttack@gmail.com

11. The undersigned reserves the right to accept or reject any or all EoIs or cancel the invitation of EoI without assigning any reason thereof.

Sd/-
Chief Engineer-cum-Project Director
PMU, OIIAWMIP



**GOVERNMENT OF ORISSA,
DEPARTMENT OF WATER RESOURCES,
OIIAWMIP, 5th FLOOR, RAJIV BHAWAN, BHUBANESWAR - 751001
Email: cepdpmu@gmail.com
Phone: +91-674-2391275, Fax: +91-674-2391459**

**ORISSA INTEGRATED IRRIGATED AGRICULTURE AND WATER MANAGEMENT
INVESTMENT PROGRAMME (OIIAWMIP) – PROJECT 1**

**REQUEST FOR EXPRESSION OF INTEREST FOR RECRUITMENT OF FIRM /
CONSULTANT FOR SURVEY, DESIGN AND RELATED SERVICES FOR MAIN CANAL
AND DISTRIBUTARIES OF KANSBAHAL SUBPROJECT**

**CE-CUM-PROJECT DIRECTOR,
PROJECT MANAGEMENT UNIT (PMU)
ORISSA INTEGRATED IRRIGATED AGRICULTURE
AND WATER MANAGEMENT INVESTMENT PROGRAMME (OIIAWMIP)**

November 2011

CONTENTS

Section	Description
Section I	Request for Expressions of Interest (Eol)
Section II	Terms of Reference
Section III	Format for Eol Submission: (i) Profile and Registration; (ii) Project Experience, (iii) Consultant's Professional Personnel; and (iv) Financial Statements
Section IV	Criteria for Evaluation of Eols

SECTION I

REQUEST FOR EXPRESSION OF INTEREST

12. The Govt. of Orissa through the Water Resource Department is implementing the Orissa Integrated Irrigated Agriculture and Water Management Investment Program (OIIAWMIP) under ADB's Multitranches Financing Facility. The investment program, aims to reduce rural poverty levels in the State by improving agriculture sector productivity and enhancing rural incomes. Resources under OIIAWMIP will be available tentatively in four tranches for projects located in northern and eastern parts of the State. Implementation of Project 1 under the first tranche is ongoing.

13. Department of Water Resources Government of Orissa is the Executing Agency for the aforesaid project. The Project Management Unit (PMU) under DoWR, Government of Orissa intends to utilize part of the proceeds of Project-1 for payment for Survey, Design and Related Services for the two Main canals of the Kansbahal Medium Irrigation System (Sundargarth District), which is one of the OIIAWMIP subprojects. For additional information on the project please visit website: www.dowrorissa.gov.in and <http://cms-csrn.adb.org>.

14. For the above purpose, the Chief Engineer-cum-Project Director (PD), Project Management Unit (PMU) invites applications from reputed national Firms/Consultants to submit their 'Expression of Interest'.

15. The services will encompass 23.42km of left and 5.82km of right main canal and associated structures. This includes: (i) topographic and condition survey of the canals and associated structures; (ii) limited geotechnical investigations; (iii) detailed design and preparation of drawings for 16 new structures and for about 91 existing structures which are to be repaired / renovated; (iv) preparation of drawings, BoQ, engineer's estimate and tender documents.

16. Consultants may submit their 'Expression of Interest' in joint venture with other Consultants or a consortium of firms to comply with aforesaid requirements. All consultants and experts must be from ADB member countries and be eligible to participate in ADB financed projects under the provision of ADB's Procurement and Consulting Guidelines.

17. Interested Firms/Consultants should submit an amplified "Expressions of Interest, EoI" which contains the following information, all in the format as given in this Document:

- v Consultants Profile and Registration
- vi Project Experience
- vii Consultant's Professional Personnel
- viii Financial Statements

18. The Consulting Firm/Consultant will be selected and engaged under Consultant's Qualification Selection (CQS) procedures in accordance with the guidelines on the Use of Consultants by Asian Development Bank and its Borrowers (April 2010). Selection of a Firm/Consultant is on the basis of the EOI and the selected firm will be asked to submit a combined technical-financial proposal and then invited for contract negotiation.

19. The submitted amplified EoIs will be evaluated in accordance with the criteria given in this Document. Only the Firm/Consultant that submitted the highest – ranked EOI will be invited to submit a technical and financial proposal. The technical proposal will confirm the professional staffing given in the amplified EoI (or propose equivalent or better staff), as well as providing a methodology statement and work plan with detailed schedule to complete the assignment. The financial proposal will state a lump sum amount for the assignment

substantiated by staffing costs and expenses. Subject to a satisfactory technical proposal contract negotiations will be initiated and, if successful, culminate in contract signing.

20. Interested Firms/Consultants may obtain more information, by attending Pre-Submission of EOI Meeting to be held on **15th December 2011 at 11 A.M.** in the Conference hall of the office of the Chief Engineer-cum-Project Director, PMU (OIIAWMIP).

21. The sealed Expression of Interest from the eligible experienced and competent Firms/Consultants are to be submitted at one of two addresses indicated below, in hard and soft (electronic-CD) copy by **3rd January 2012 up to 1:00 pm** during office hours. The name of the sub-project shall be clearly indicated on the outer envelope. Any Eols received late through post will not be considered for opening (the Department will not be responsible for any lapses or delays in postal delivery). The Expressions of Interest so received shall be opened on **3rd January 2012 at 4:00 pm** in the office of the undersigned in presence of the Firms/Consultants or their authorised representatives who wish to attend. In the event of the office being closed on the last date of submission and opening of Expression of Interest (EOI), the Eols will be received and opened on the next working day at the same time and same venue.

- a Chief Engineer-cum-Project Director, PMU (OIIAWMIP),
Department of Water Resources, Govt. of Orissa,
5th Floor, Rajiv Bhawan, Bhubaneswar- 751001, Orissa, India.
E-mail: cepdpmu@gmail.com
Tel: +91- 674- 2391475, Fax: 0674- 2391459.

- b Superintending Engineer
Eastern Circle, Cantonment Road, Cuttack – 753 001, Orissa, India.
E-mail: seecuttack@gmail.com
Tel: +91- 671- 2301030

22. The undersigned reserves the right to accept or reject any or all Eols or cancel the invitation of Eol without assigning any reason thereof.

**Chief Engineer-cum-Project Director
PMU, OIIAWMIP**

SECTION II

**TERMS OF REFERENCE FOR
SURVEY, DESIGN AND RELATED SERVICES FOR MAIN AND DISTRIBUTARIES OF
KANSAHAL CANAL SYSTEM**

Contents

I.	INTRODUCTION	1	
	A.	Sub-project Location	1
	B.	Description of Existing Irrigation System	2
	1.	Dam and Spillway	2
	2.	Existing Irrigation System	3
	3.	Left Main Canal	3
	4.	Right Main Canal	3
	5.	Main Canal Structures	3
	C.	Envisaged Scope of Rehabilitation and Upgrading Works	4
II.	DETAILED TERMS OF REFERENCE	6	
	A.	Introduction	6
	B.	Liaison, Monitoring and Assistance by the Project Management Unit	6
	C.	Topographic and Condition Surveys	7
	1.	General	7
	2.	Permanent Benchmarks	7
	3.	Canal Strip Surveys and Longitudinal Sections	7
	4.	Site Topographic Surveys for New Structures	7
	5.	Existing Structure Topographic and Condition Surveys	8
	6.	Plotting of Site Surveys	8
	7.	Accuracy of Topographic Surveys	8
	D.	Geotechnical Investigations	9
	1.	Introduction	9
	2.	Investigations at new structure sites	9
	3.	Investigations along canals	9
	4.	Recommendations for additional Investigations	10
	E.	Detailed Design	10
	1.	Design Criteria, Priority for Infrastructure Works and Standardization	10
	2.	Dam Repairs	12
	3.	Design of Main Canals	12
	4.	Design of Head Regulators	12
	5.	Design of Bridges	13
	6.	Measuring Flumes	13
	7.	Outlets	13
	8.	Other Structures	13
	F.	Drawings	13
	G.	Bills of Quantities	13
	H.	Packaging of Civil Works Contracts	14
	I.	Contract Documents	14
	J.	Engineer's Estimate	14
	K.	Quality Assurance	15
III.	REPORTING, PERSONNEL, CONTRACT AMOUNT AND PAYMENT SCHEDULE	16	
	A.	Sequence of Survey and Detailed Design Work	16
	B.	Reporting	16
	C.	Personnel, equipment and facilities	19
	1.	Personnel	19

2. Equipment and facilities	19
D. Contract amount and payment schedule	20

ANNEXES

ANNEX A: MINIMUM PROFESSIONAL CONSULTANTS QUALIFICATIONS AND EXPERIENCE

NOTE: The bidder must sign all pages of this ToR (downloaded from the cited DoWR website) to signify a full and clear acceptance and understanding of this document, which shall form part of the contract.

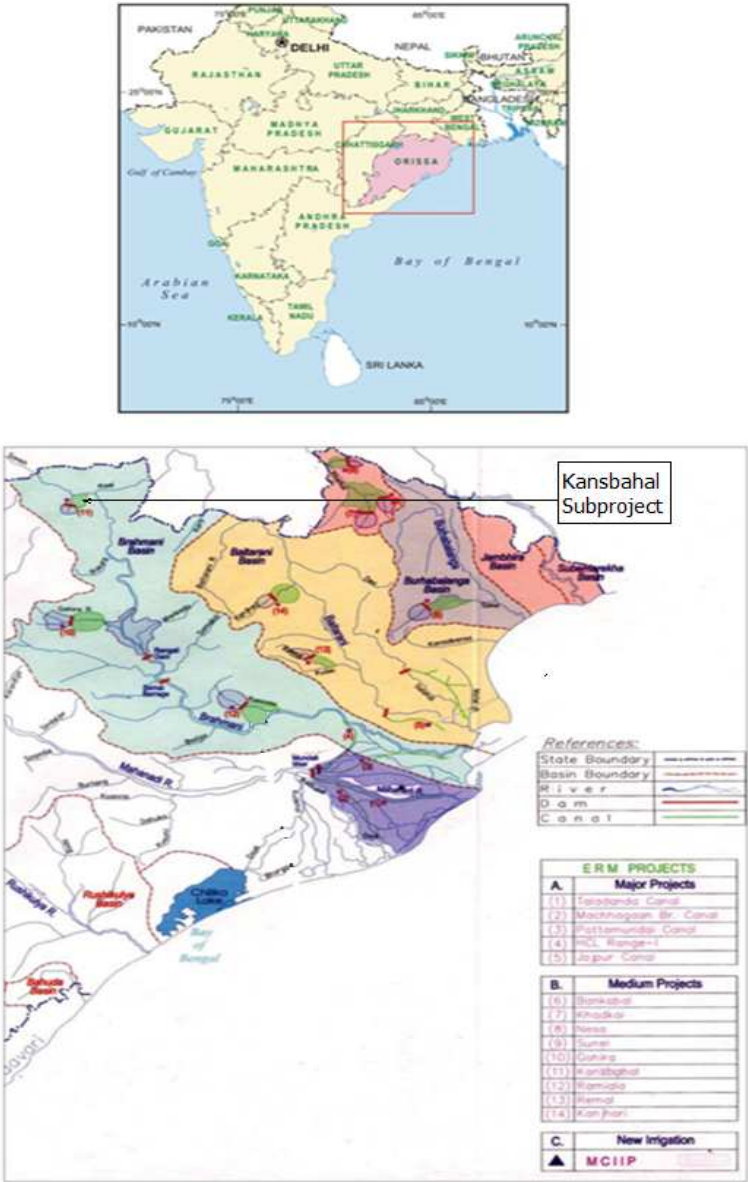
TERMS OF REFERENCE FOR SURVEY, DESIGN AND RELATED SERVICES FOR MAIN AND DISTRIBUTARIES OF KANSBAHAL CANAL SYSTEM

I. INTRODUCTION

A. Sub-project Location

The Government of Orissa through the Government of India has availed a Multi-tranche Financing Facility (MFF) loan from the Asian Development Bank (ADB) approved in Sept. 2008 to partly finance the implementation of the Orissa Integrated Irrigated Agriculture and Water Management Investment Program (OIIAWMIP). It intends to apply part of the proceeds of this loan for payments for survey, design and related services for two Main canals of the Kansbahal Medium Irrigation System, which is one of the OIIAWMIP subprojects. The executing agency for the project is the Department of Water Resources (DOWR), Government of Orissa. The location of the scheme is shown on Figure 1 along with the locations of other sub-projects included in the programme.

Figure 1: Location of Sub-project



The 4,615ha Kansbahal Sub-Project is located in the Rajgangpur Block, Sundargarh District in the north west of Orissa State. The scheme lies in the Brahamani River basin and is supplied from a dam on the Badjore River.

B. Description of Existing Irrigation System

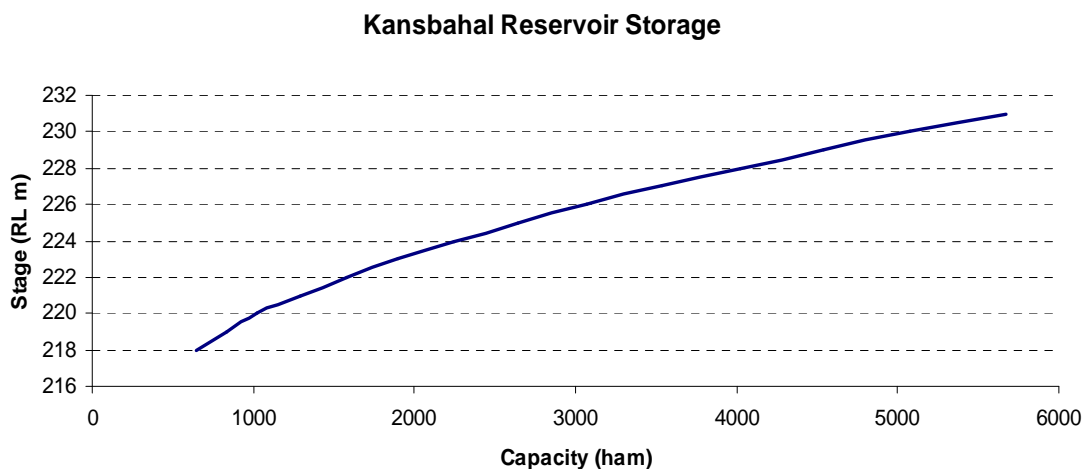
1. Dam and Spillway

The Kansbahal dam and spillway were constructed between 1981 and 1993. The dam comprises homogeneous earth fill with a vertical sand chimney, horizontal grade filters and a rock toe. The length of the earth dam section is 383m and 597m with a 70m long spillway in the middle.

The maximum height of the earth dam is 28.0m and the top width is 6m. The top bank level is RL 231m and the crest level of the spillway is RL 222m and the live storage capacity is 28.72 Mm³. The “ogee” crest spillway has five radial gates (12m x 6m) and will pass the “standard project flood” of 1,745 m³/s. The upstream face of the dam is protected by rock pitching and there are concrete chutes on the downstream face to safely remove surface water. The salient features of the dam and spillway are:

Catchment area	179 km ²
Live storage at FRL	28.72 Mm ³
Top bank level (TBL)	RL 231.00
Full reservoir level (FRL)	RL 228.00
Dead storage level (DSL)	RL 220.50
Length of earth dam section	980m
Length of spillway	70m
Maximum height of dam	28m
Embankment top width	6m
Type of spillway	“Ogee” chute
Number and size of gates	5 of 12m x 6m radial gates
Spillway crest level	RL 220.00
Spillway capacity	1,745 m ³ /s

The reservoir stage/capacity curve is shown below:



2. Existing Irrigation System

The canal system was constructed between 1981 and 1996. The original cultivatable command area (CCA) was 5,050ha, however due to industrial development, particularly private iron ore blast furnaces; the CCA has reduced to 4,640ha. Over the years, the condition of the main canal and ancillary structures has deteriorated, resulting in reduced flows, distribution problems and increased maintenance. The salient features of the scheme are given below:

	Left Canal	Right Canal
Original command area	3,890ha	1,160ha
Estimated present command area	3,561ha	1,079ha
Revised design discharge (app 2011)	3.7 m ³ /s	1.1 m ³ /s
Length of main canal	23.424km	5.82km
Canals off taking from main canal	14	8
Length of minor and sub-minor canals	53.078km	10.709km
Number of outlets in command area	253	85
Average command area per outlet	14.43ha	12.68ha

There are two main canals from the dam; the right bank canal is 5.82km long and has a design discharge of 1.1 m³/s and the left bank is 23.424km long with a discharge of 3.70 m³/s. Both canals follow the contour and as such there are no drop structures or cross regulators. The current estimated command areas for the right and left bank canals are 1,079ha and 3,651ha respectively. The scope of this contract covers the right and left main canals only.

3. Left Main Canal

There are 13 minors and one sub-minor offtaking directly from the left main canal, though only five of the minors have a discharge exceeding the normal minor threshold of 0.2 m³/s. In addition there are 21 water courses and 18 field outlets.

4. Right Main Canal

The right bank canal has eight minors, though only one exceeds the 0.2 m³/s minor threshold. In addition there are nine water courses.

5. Main Canal Structures

Existing left and right main canal structures are tabulated and described below.

Table 1: Main canal structures

Type of structure	Left canal	Right canal	Total
Head regulator (HR)	14	8	22
Canal siphon (CS)	5	3	8
Escapes	1	0	1
Cross drain structure (DS)	24	12	40
Village road bridge (VRB)	30	6	36
Aqueduct	4	1	5
Field outlets	39	12	51

a. Head Regulators

On the left main canal the ten HRs in the upper reaches are gated but the four at the tail are not. However, all the gates are damaged and some are inoperable. The stone masonry head regulators comprise a simple headwall in the canal bank, a pipe culvert through the embankment and a downstream headwall. All the gates require either replacement or substantial repairs and most of the headwalls need replacing.

The eight head regulators on the right main canal all require substantial repairs.

b. Escape

The single escape requires minor repairs

c. Cross Drainage Structures

The alignment of the two main canals along the contour means there are more canal siphons, aqueducts and cross drainage structures than usual, to allow the surface runoff from the upper slope to safely pass under/over the canal. Several of the siphons are leaking and all eight require minor repairs. The aqueducts are generally in reasonable condition though all have leaking joints. The cross drainage structures are functional and only one needs total reconstruction. Additional cross drainage structures or drainage inlets may be necessary.

d. Road Bridges

The 36 village road bridges are in fair condition, though some require new parapet walls and in some cases the abutments and wing walls need to be repaired.

e. Field Outlets

There are 51 direct field outlets from the main canals. As part of the rehabilitation work consideration should be given to providing gates on these structures to facilitate the equitable operation of the system.

C. Envisaged Scope of Rehabilitation and Upgrading Works

The project / program has completed initial studies and prepared a Feasibility Report and a Detailed Project Report (DPR) for the Kansbahal sub-project. The scope of the proposed rehabilitation and improvement works have been determined from these studies and

includes the rehabilitation of 29.24km of Main canal the repair / up-grading of many of the associated structures as well as construction of some new structures.

The topographic surveys of the two main canals has been initiated by the Department with long and cross survey completed, together with benchmark pillar establishment. No structure surveys, detailed designs or drawings have been undertaken.

Under this contract it is required to: (i) check benchmark pillars elevations / coordinates and confirm the validity of completed long section designs; (ii) topographic and condition surveys of all structures along the two main canals; (iii) carryout limited geotechnical investigations for new structures and also along sections of canal embankment where seepage is known to be problematic; (iv) prepare detailed designs and drawings for structures – designs for canals are not expected to change from those already prepared / approved except as agreed with the PMU; (v) package the works into contracts and prepare contract documents including quantities for each contract along with engineers estimates.

Details of the scope of works are in Table 2. The detailed terms of reference are given in Section II: Detailed Terms of Reference.

The total number of structures is 159, and of these 41 require renovation and 16 are complete replacement or new structures. The rehabilitated and up-grading of these structures will improve water distribution and communications across the canal.

Table-2: Summary of Canal Structure Works

Type of Structure	Left Main Canal			Right Main Canal		
	Existing structures	Replaced or new	Renovation	Existing structures	Replaced or new	Renovation
Head regulator (HR)	14	0	13	8	0	5
Canal siphon (CS)	5	0	2	3	0	1
Escapes	1	1	0	0	0	0
Cross drain structure (DS)	24	1	9	12	0	1
Village road bridge (VRB)	30	5	15	6	1	3
Aqueduct	4	0	3	1	0	0
Measuring flume	0	5	0	0	2	0
Field outlets	39	0	33	12	0	6
Cross regulator	0	1	0	0	0	0
Total	117	13	75	42	3	16

II. DETAILED TERMS OF REFERENCE

A. Introduction

The Department of Water Resources is intending to out-source to a reputable competent firm the survey and detailed design work for intended rehabilitation and upgrading works for the main and distributary irrigation systems. The consultancy services are to cover: (i) topographic and condition surveys for the structures (longitudinal and cross section surveys already been carried out by the Department); (ii) geotechnical investigations for new structures; (iii) detailed design and preparation of drawings; and (iv) preparation of bills of quantities, contract documents and the “engineer’s estimate” for each contract.

The detailed Terms of Reference for the contract are given below.

This contract covers the two main canals and structures listed in the previous Tables 1 and 2. The surveying and detailed design of the rehabilitation works for minors, sub-minors and field channels will be undertaken separately and is outside the scope of this contract.

B. Liaison, Monitoring and Assistance by the Project Management Unit

This survey and design contract will be one of several awarded for each of the sub-projects where rehabilitation and upgrading is planned under the Programme and each of the survey and detailed design firms will be required to set up a design office in Orissa and maintain a close working relationship with the Project Management Unit (PMU) and its design staff. Close coordination will be required, inter-alia, for the following:

- i To prioritise the design and rehabilitation / upgrading works to ensure that the engineer’s estimates are broadly within the estimated budget for the infrastructure works.
- ii To agree on the packaging of the rehabilitation and upgrading civil works contracts.
- iii To ensure adoption of standard design criteria, survey and design procedures, standard drawings including standardisation of scales, title box, etc, bill item descriptions; contract specifications, etc for all subprojects.
- iv To confirm accuracy of existing surveys carried out by the Department, and specifically the Department’s benchmarks.

The PMU will monitor progress and performance of the study in order to ensure that the services are undertaken in a professional manner and that all out-puts are to a high standard. Specifically it is envisaged that specialist design staff appointed to a Project Design Cell will be appointed to liaise and monitor activities and deliverables of all the survey and detailed design firms.

The PMU / Irrigation Department will make available to the consultant, at no charge, all topographic survey data it has to hand. In addition the PMU will assist the consultant to procure maps and aerial photographs from the Survey of India office, though the consultant will be responsible for any payments required. Similarly, if required the Department will provide supporting letters to enable the consultant to procure satellite imagery from the commercial sector, but again any payments would be the consultant’s responsibility.

C. Topographic and Condition Surveys

1. General

The consultant shall undertake the topographic surveys using GPS instruments and/or total survey stations, with the data being stored digitally for download, reducing and plotting using approved DGM (digital ground model) software. The instruments shall be calibrated and the accuracy checked prior to commencing the surveys.

The Department has already completed the topographic surveys of both the left and right the main canals. The consultant shall survey all the existing major structures and detailed site surveys for the proposed new structure locations. Detailed surveys of outlets to minors, sub-minors and field channels are excluded, though the outlet invert, pipe diameter and length shall be recorded.

The datum for the surveys shall be the India National Datum and the consultant shall undertake the necessary surveys to transfer the datum to the site from two GTA Benchmarks. The consultant shall establish new benchmarks, where required to supplement those already taken by DoWR. The new and existing benchmarks shall be included in a comprehensive closed survey to confirm the level and co-ordinates of all the subproject benchmarks.

All survey drawings shall be on A3 paper, plotted at an approved scale, with a standard title box, notes, scale bar and revision history layout

2. Permanent Benchmarks

The consultant shall establish new permanent bench-marks (BM) where required at a maximum spacing of 500m, these shall be clearly visible from at least two others to facilitate reinstatement in the event of one being damaged or lost. The new BMs may be located on existing immovable structures or rocks, with a concrete nail driven into the object to indicate the exact point and the position clearly marked with permanent red paint. If no such hard point exists, a 600mm long, 200mm diameter concrete benchmark shall be provided that protrudes 150 mm above ground level. A nail shall be set in the centre of the benchmark. The benchmark shall be set in concrete to prevent removal.

Each new BM shall be clearly numbered in red paint or in the case of a concrete block, etched into the top whilst the concrete is still wet. A register of the new and existing benchmarks shall be set-up and a separate site plan for each new BM shall be prepared giving the co-ordinates, a description of the point and a sketch map.

3. Canal Strip Surveys and Longitudinal Sections

The longitudinal and cross section surveys of the two main canals have been completed and are available from the PMU / concerned Executive Engineer. The consultant shall review the survey data and also the existing longitudinal section designs and drawings prepared by others. Any concerns regarding the accuracy of the completed surveys or the designs shall be immediately discussed with the PMU and approved the modality (including payment) of any necessary additional survey or design discussed.

4. Site Topographic Surveys for New Structures

The topographic survey shall comprise a site plan extending the full width of the canal plus about 30m from the bank or from the outer limit of the proposed / existing permanent structure. Spot heights shall be taken at 10m centres, and more frequently along the canal

banks or where there is change in slope. The position, size and elevation of all salient features including: (i) benchmarks, (ii) embankments; (iii) canals; (iv) buildings; (v) roads / tracks; (vi) power and telephone lines; (vi) existing permanent or semi-permanent (irrigation) structures, etc, shall be clearly shown.

In addition to the spot heights, five cross-sections of the canal are required at the structure, two upstream, two downstream and one at the structure site. The upstream and downstream sections shall be at 10m and 50m from the structure. The cross sections should extend across the full width of the canal plus a minimum of 20m from the bank on either side.

If the new structure is replacing an existing one, this shall be surveyed in order to determine the quantities for demolition.

5. Existing Structure Topographic and Condition Surveys

The consultant shall survey the existing major structures (ie excluding outlets) along the main and distributary canals. Survey shall comprise topographic and condition surveys.

Topographic surveys shall record key levels and dimensions in sufficient detail to prepare accurate drawings of the existing structures, plus the surrounding area. The existing structure survey shall include: (i) existing plan dimensions of structure; (ii) levels of key walls, bridge decks, upstream and downstream bed and apron levels, and sill level, and other structural elements; (iii) dimensions and elevations for at least two cross sections across the structure, at right angles to each other.

Condition surveys shall clearly indicate the condition of the structure, the components requiring repair/renovation and the extent of the work, with at least one, and typically three or four photographs of each structure to illustrate the condition. For the condition surveys standard pro-forma(s) shall be developed and approved by the PMU prior to start of the surveys.

For the outlets the consultant shall survey the invert level, diameter of the pipe or box section dimensions and the length for outlet barrels, as well as the condition.

6. Plotting of Site Surveys

The structure/site drawings shall be plotted on A3 paper, at an appropriate scale with all the key dimensions shown and the north point indicated on the plan. Drawing scales shall generally be as follows:

Detailed topographic (structure) drawings: 1:50, 1:100, 1:200, 1:500

Sections: (i) vertical: 1:20, 1:50, 1:100 (ii) horizontal: 1:50, 1:100, 1:200

Adjacent features, such as a canal embankment shall be included in the survey, together with spot heights in the immediate vicinity and any additional features. The existing DoWR nomenclature shall be used to identify the type and number of each canal and structure.

7. Accuracy of Topographic Surveys

The permanent bench marks shall be reduced to the India National Datum and the field survey shall connect to a minimum of two national benchmarks. The maximum closing error between two adjacent bench marks shall be $\pm 5\text{mm}$ for elevation and $\pm 20\text{mm}$ for the horizontal coordinates and the overall closing error through all the benchmarks shall not exceed $\pm 10\text{mm}$ for elevation and $\pm 50\text{mm}$ in the horizontal.

D. Geotechnical Investigations

1. Introduction

Preliminary geotechnical investigations shall be carried out: (i) at new structures primarily to enable design of foundations; and (ii) along selected lengths of the canal where seepage is significant and/or embankment stability of concern.

2. Investigations at new structure sites

a. Soil Boring

Geotechnical investigations at the 16 new/replacement structures shall comprise soil boring to depths of 8m. Two boreholes shall be drilled at each structure. The diameter of borings shall be 150mm.

Digital photographs shall be taken of the site and the borehole locations. They shall be taken with a camera of minimum resolution 6 megapixels.

The various types of soil, the variations in consistency, the sequence, the depths to changes in strata and the information shall be recorded as boring procedures and be compiled as a Daily Report and a Preliminary Log.

Sampling will consist of small disturbed samples of not less than 0.7kg with at least three samples per borehole.

The depths from which all samples are taken shall be recorded to an accuracy of 0.1m.

b. In-situ Standard Penetration Tests

All in-situ testing is to be carried out by personnel who have been trained and are experienced in the use of the equipment, the test methods and the recording of results.

The penetration resistance may be measured using the test equipment and procedures as described in BS 1377 or equivalent Indian Standard and used for computation of the bearing capacity of the soil.

c. Laboratory testing

Laboratory testing shall be in accordance with BS1377 or equivalent Indian Standard. The tests to be carried out on each sample shall comprise:

- Classification / particle size distribution
- Moisture content
- Liquid limit, plastic limit and plasticity index

d. Reporting

The consultant's geotechnical report for new structure site shall contain the borehole logs, depths of sampling, SPT test results, laboratory test results and site plans showing borehole locations. Levels for borehole logs will be given with reference to the India national datum.

3. Investigations along canals

The consultant shall undertake geotechnical investigations at selected locations along the canals where seepage is significant and/or where embankment stability is threatened. For

the Kansbahal sub-project “canal investigations” shall be carried out along both the main canal embankments. Previous studies had indicated that approximately 60 percent of the combined main canal length is lines.

For a total length of about 3km, 3 number, 2.0m deep holes shall be augured at typically 50m intervals in the canal and adjacent embankment. The soil type at various depths in the auger hole shall be recorded in standard logs. Soil samples shall be taken from a representative small (10%) of auger holes for laboratory testing, specifically for:

- Classification / particle size distribution
- Moisture content
- Liquid limit, plastic limit and plasticity index

The consultant shall estimate the likely seepage losses and shall recommend / identify appropriate and cost effective remedial measures for inclusion in the scope of civil works (eg full or partial canal prism lining, embankment strengthening, etc).

The consultant’s geotechnical report for investigations along canal shall contain the auger hole logs, location and depths of sampling, laboratory test results and canal plans showing borehole locations. Levels for auger-hole logs will be given with reference to the India national datum. Recommendations for remedial works shall also be given.

4. Recommendations for additional Investigations

The consultant shall include in his geotechnical report recommendations for any additional investigations. These may be done under the SDD contract, or if this is beyond the scope, included in the main civil works contract.

E. Detailed Design

1. Design Criteria, Priority for Infrastructure Works and Standardization

a. Criteria for Engineering Designs

The design of the rehabilitation and upgrading works for the canals and hydraulic structures and the new village road bridges will be in accordance with the “*Criteria for Engineering Design*” prepared for the Programme, which will be made available to the consultant on award of contract. These design criteria are based on internationally accepted standards, amended as required for consistency with Indian Standards. Structural design work shall be in accordance with the relevant Indian Standard.

b. Priority for Infrastructure Works

In accordance with the “*Criteria for Engineering Design*”, priority for infrastructure works for both major and medium schemes is as follows:

- i Any vital works to ensure safety / integrity of irrigation system, such as structures and canal banks where seepage may lead to earthworks failure.
- ii Hydraulic control structures for improved flow control and flow measurement for the main and distributary canal systems to the heads of minor canals.
- iii Additional escapes if required.
- iv Bridges for improved access across canals (and drains in the command area).
- v Selective lining of canal reaches where seepage losses are high.
- vi Improved access along inspection / patrol roads.

Extensive canal lining without (benefit/cost) justification will not be supported under the Project.

The design firm shall adopt standards to speed up the design process and ensure a common and consistent approach for all sub-projects. Standards to be adopted with prior approval by the PMU are outlined below. The PMU will provide guidance on acceptable standards.

c. Standard Drawings

Standards for drawings shall comprise:

- i Standard drawing template with project title box
- ii Standard drawing notes
- iii Agreed drawing numbering system
- iv Agreed standard drawing styles and layers
- v Agreed grades of concrete
- vi Typical canal cross sections
- vii Standard designs and drawings for, inter-alia, bank protection, patrol road cross sections, reinforced / masonry / mass concrete wall cross sections, expansion and contraction joints, concrete bridge decks, culvert crossings, hand railing, water level gauges, etc

d. Standard Design Tools

The creation and use standard design tools and procedures to speed up design calculations is envisaged. Standard calculation spreadsheets for typical structures will be adopted by the design firm (eg head regulators, bridges, flow measurement structures, etc). These shall be filed in an orderly fashion and be available for review by the DoWR at any time. All calculations shall be checked. Each sheet shall show the name of the project and the component being designed at the top and in the top right corner there should be a box with the name of the originator, date, sheet number, the name of the checker and date checked.

e. Use of Utilities to Speed up Drawings

Drawings will be prepared using CAD software. The process may be improved by:

- i Scripts and AutoLISP routines for long and cross section drawings.
- ii Use of Xrefs to embed standard base information and details into drawings.
- iii Data tables shall be prepared as spreadsheets and embedded in drawings.
- iv Standard drawing template, styles and layers.
- v Use of high resolution satellite imagery as base maps and digital photos for illustrating structure rehabilitation.

f. Standardization of Bidding Documents

One or more sets of standard bidding documents shall be prepared to cover the range of contract types and sizes. They shall be based on the ADB standard bidding documents and include standard technical specifications, preambles and methods of measurement so these only have to be prepared and agreed once.

g. Standardization of Bill of Quantity Production

Speed, quality and consistency of BoQ production can be achieved using standard spreadsheet(s) containing a table of standard work items and the relevant units. The process can also use standard unit rates to quickly produce consistent cost estimates.

2. Dam Repairs

The consultant shall inspect the dam and ancillary works and prepare designs, etc, for any minor works to be carried out under the project. If a major problem is identified, this shall immediately be brought to the attention of PMU, who will then decide whether the design of the repair work is to be undertaken internally or if an addendum to this contract is to be prepared.

3. Design of Main Canals

The left and right bank canals would be re-modelled along the entire length. The feasibility study proposed that about 60 percent of the main canals would require lining. Issues to be addressed during the design include:

- i Allow nominal 0.05m head loss across the main structures and 0.2 to 0.4 at cross regulators that also serve as measurement structures.
- ii Raise canal banks and where necessary widen the embankments to provide a minimum freeboard of 0.6m along the left main canal and 0.5m for the right.
- iii Ensure all outlets are commanded, even when the flow is only 50 percent of the design discharge.
- iv Sections of high fill where seepage is occurring shall be investigated and remedied by canal lining and/or bank stability measures.
- v Concrete lining shall be 75mm thick and a 300mm wide x 100mm deep beam shall be provided under expansion joints. Where the canals pass through "black cotton" soils a rectangular section is proposed with masonry walls on a reinforced concrete floor.

4. Design of Cross and Head Regulators

The preliminary surveys carried out by the Department indicate that a new cross regulator is required on the left main canal. There are 22 head regulators of which 18 have been identified as requiring repair. The scope of the rehabilitation designs shall include:

- i Raising and strengthening of the walls as necessary
- ii Structure capacity to be design discharge plus 15 percent surcharge
- iii Refurbishing existing or provision of new gates, provide safe operating platforms
- iv Design of upstream and downstream transitions to improve flow characteristics
- v For each structure, check percolation and where necessary provide additional cut-offs and seepage apron
- vi Check effectiveness of existing stilling basin for energy dissipation and modify if necessary
- vii Ensure the offtakes can operate satisfactory when the flow in the main canal is k50 percent of the design flow
- viii Design of water level gauges, hand rails, etc.

All offtakes from the main canals should be gated to provide enhanced regulation, particularly during the rabi season.

5. Design of Bridges

The estimated number of village road bridges requiring major and minor repairs is 10 and 16 respectively.

6. Measuring Flumes

Seven new measuring flumes are proposed, five on the LMC and two on the RMC. Since the main canals are aligned along the contour the head loss across the flumes will be minimal. Consequently it is recommended that trapezoidal Parshall flumes or triangular/trapezoidal profile flat weirs are used. Where no head loss is possible a straight lined section of canal, with staff gauge would suffice, but this will have to be calibrated, using a flow meter.

7. Outlets

The consultant shall check the condition of the 51 field channel offtakes and where repairs are required the scope of work, together with a sketch and the quantities shall be described. A standard pro-forma shall be developed for the purpose.

8. Other Structures

The design of cross drainage structures, escapes and social structures (washing points and cattle drinking points) shall comply with the *Criteria for Engineering Design* and the relevant Indian Standards and codes.

F. Drawings

All contract drawings shall be plotted on A3 paper. A general notes page shall be included at the beginning of a "set" of drawings for a structure / canal to avoid repetition of notes on all drawings. The layout of the sheet, contents of title box, scales, revision boxes, etc, shall comply with DoWR practice and any deviation must be approved by the authorised representative. The detailing of the works shall comply with the relevant IS, ie IS 5525: 1968 (reaffirmed 1999) recommendations for detailing reinforcement in reinforced concrete works.

Drawing scales for structures shall generally be as follows:

Detailed topographic (structure) drawings: 1:50; 1:100; 1:200; 1:500

Sections: (i) vertical: 1:20, 1:50, 1:100 (ii) horizontal 1:50, 1:100, 1:200

G. Bills of Quantities

The Consultant shall prepare Bills of Quantities for the works. It is recommended that the bills for individual structures and canals are initially kept separate to facilitate the preparation of the BoQ for each of the separate construction packages (see below).

All measurements shall be in accordance with IS 1200: 1974, Method of measurement of building and engineering works.

The earthworks quantities for the main and distributary canals shall be calculated in reaches between major structures, not exceeding 3km in length. This information shall be

consolidated for the BoQ, but a separate schedule shall be prepared and submitted to PMU to facilitate the monitoring of earthworks progress and identifying excessive variations.

H. Packaging of Civil Works Contracts

The size (estimated cost) of the civil works contracts shall be discussed and agreed with the PMU in the first month of the assignment. Each package should be “stand-alone” and not be dependent on the progress or work output of other contracts. The consultant shall assess the scope of work, recommend the number of packages and determine the most appropriate way to divide the work. It is anticipated that the works will be divided according to canal reaches, with the same contractor undertaking the canal re-profiling and the rehabilitation of the associated structures.

Where possible the packaging of works should aim to maximize the number of contractors interested in bidding to ensure a competitive tendering process.

I. Contract Documents

Following PMU approval to the packaging and boundaries for each civil works contract, the consultant shall prepare separate contract documents for each package. None of the packages are expected to exceed USD 10 million, consequently the ADB’s standard bidding documents for small works shall be used with minor amendments by the GoO. The bidding shall be QCBS with post-qualification, ie separate technical and financial envelopes.

The documents shall comprise:

PART I, Bidding Procedures

- Section 1, Instructions to bidders (ITB)
- Section 2, Bid data sheet (BDS)
- Section 3, Evaluation and qualification criteria (EQC)
- Section 4, Bidding forms (BDF)
- Section 5, Eligible countries (ELC)

Part II, Requirements

- Section 6, Works requirement (WRQ)

Part III, Conditions of contract and contract forms

- Section 7, General conditions of contract (GCC)
- Section 8, Particular conditions of contract (PCC)
- Section 9, Contract forms (COF)

Section 4 includes the bill-of-quantities and Section 6 comprises the specifications, drawings and any supplementary information that describe the scope of works. The drawings shall be A3 size and attached as a separate bound volume to the contract.

The specifications shall be based on the Government of Orissa, Department of Water Resources: Technical Specification for Construction of Canal Works for ADB Assisted Schemes. If a particular item is not covered by these specifications the consultant shall prepare the specifications and submit to the PMU for approval, prior to incorporating in the bid documents.

J. Engineer’s Estimate

The latest available GoO, Works Department schedule of rates shall be used to determine the “engineer’s estimate”. In accordance with the GoO regulations the rates given in the

latest schedule (currently 2010) shall be up-dated using the most recent basic material, labour and equipment costs, published annually by the Works Department. The engineer's estimated is highly confidential and shall under no circumstances be disclosed to a third-party.

K. Quality Assurance

The consultant shall include in the Inception Report details of the quality assurance procedures to be adopted whilst implementing the consultancy services. This report shall include, inter-alia, the procedures for carrying out the survey and design assignment, standards to be adopted, and level and scope for checking of calculations, drawings and all other contract out-puts.

III. REPORTING, PERSONNEL, CONTRACT AMOUNT AND PAYMENT SCHEDULE

A. Sequence of Survey and Detailed Design Work

The sequencing of survey and detailed design work shall be discussed and agreed with PMU prior to the commencement of field survey work.

B. Reporting

The consultant shall prepare the following reports during the course of the studies. Where indicated separate reports shall be prepared for the main canal and distributaries. The preparation of draft and final reports is not envisaged, however to facilitate approval of the reports the survey and detailed design firm should gain prior approval from the PMU to the content and scope of each report. 0.5 months is allowed for review / approval by the PMU of each report.

Report	Nr of Hard Copies	Indicative Submission Dates	Remarks
Inception Report	6	+ 0.5 mon	
Monthly Reports	6	Monthly	Summary of monthly progress
Survey Reports	4	+ 2.5 mon	Topographic and Condition Surveys
Geotechnical Report	6	+ 3 mon	For new structures, including borehole logs and test results, as well as auger holes along critical canal sections
Design Statements	4	+ 4 mon	Spreadsheets and longitudinal sections for each canal
Design Reports	4	+ 4 mon	Including drawings, calculations and quantities
Packaging Intent Report	6	+ 4 mon	This report must be approved before commencing work on the contract documents
Contract Documents	4	+ 5 mon	Separate stand-alone contract documents shall be prepared for each civil works contract
Final Report	6	+ 5 mon	Summarizes the work carried out under the assignment

Submission dates are the number of months from the date of mobilization

Hard copies of the above reports and documents shall be submitted to the PMU before the submission deadline. In addition the consultant shall submit six electronic copies on clearly labelled CD or DVD or other approved media, conforming to the following requirements:

- i Where appropriate, the consultant shall compress (ZIP) files, so that the entire report (or volume) is stored on a single CD or DVD.
- ii The report contents shall be clearly indexed and stored in Adobe PDF format. Where MS EXCEL has been used in preparation of lists, calculations, etc, the complete MS EXCEL files shall also be submitted to facilitate verification by DoWR.
- iii In general only standard commercially available software shall be used in the work and the consultant shall list the software they propose to use. Under certain circumstances, and with the approval of the authorized person, the consultant may use non-standard software to perform part of the work, provided he makes provision for the handover of the software to the DoWR, so it is available for use at a later date to update or revise the designs.

All reports and other study documents shall be in the English language. Printing and binding shall be of high quality, suitable for presentation to government and international funding agencies. All reports shall be in A4 paper format (with fold out A3 sheets where required), except for the drawings which should be A3. Metric units according to the International System of Units are to be used throughout.

a. Inception Report

This report shall list the documents reviewed and shall up-date and elaborate on the methodology of the proposed project. The quality assurance procedures being adopted by the consultant shall be described. Special emphasis shall be placed on identifying staffing and other deficiencies and shall propose measures to address any such shortfalls.

b. Monthly Reports

The consultant shall submit monthly progress reports (six hard copies) throughout the duration the contract, not later than the 14th day of the following month. The progress reports shall (i) detail the activities undertaken during the previous month; (ii) monitor progress against the consultant's work plan provided in their proposal; (iii) identify potential problems and recommend remedial actions to avoid delaying the completion of the contract; (iv) provide a schedule of staff inputs for the month under review and cumulative inputs; and (v) detail forthcoming and planned activities.

c. Survey Reports

This report shall cover both the topographic and condition assessment surveys. For the survey component the report shall summarize the methodology adopted, assess the level of accuracy achieved and a list the permanent benchmarks with coordinates and a description of the mark. The longitudinal sections for the two main canals and the site plans for existing and new structures shall be presented in the required format. The benchmark records and the structure condition survey sheets shall be attached as an annex. The cross section details shall be submitted separately in approved digital format.

d. Geotechnical Report

The geotechnical report shall detail the results, findings and recommendations of the geotechnical investigations from: (i) boreholes drilled at sites of (new) structures pertaining to foundation conditions; and (ii) auger-holes along selected critical (high seepage) reaches of canal embankment.

If additional explorations are necessary the report should include a detailed statement on the scope of the additional investigations.

e. Design Statements

In accordance with Government procedures, the consultant shall prepare a summary design statement for each canal detailing the type and location of proposed structures together with the key design characteristics of each.

f. Design Reports

The Main Design Report shall detail the procedures and criteria used in the design process along with tabulated data, including the design statements and abstract of quantities.

Attached annexes to the report shall comprise: (i) A3 drawings for canal long and cross sections and for all new structures as well as structures requiring significant rehabilitation / upgrading; (ii) calculations; and (iii) priced bills of quantities.

g. Packaging Intent Report

This short (5-10 page) report shall recommend, with justifications, the proposed division of the required civil (infrastructure) works into discrete contract packages, along with estimated costs of each package, construction period and sequencing. This report shall be prepared following consultation with concerned Department staff and the PMU.

h. Contract Documents

Following PMU approval of the Packaging Intent Report the consultant shall prepare separate bidding documents for each civil works package. These shall be based on the ADB small civil works format, with minor changes to comply with GoO regulations. The bidding process shall be QCBS with a two envelope evaluation procedure.

i. Final Report

This short (5-10 page) report should summarize the work undertaken and the contract outputs/ deliverables.

C. Personnel, equipment and facilities

1. Personnel

The total indicative professional consultant staff input is 31 months. In addition there are 23 months of technical and administrative staff and the consultant shall provide for these posts in the Financial Proposal. The key consultancy staff are listed in the following table, together with the tentative input for each position.

Key consultancy staff and indicative Inputs

Staff	Input (sm)
Professional staff	
P-1 Team leader/project manager	5
P-2 Mapping / GIS specialist / Snr Surveyor	3
P-3 Land Surveyors x 2	4 (2 x 2)
P-4 Geotechnical engineer	1
P-5 Senior irrigation design engineer	4.5
P-6 Design engineers x 2	6 (2 x 3)
P-7 Structural engineer	1
P-8 Junior/assistant engineers x 2	6 (2 x 3)
P-9 Procurement/contract specialist	0.5
Total	31
Technical and administrative staff	
T-1 Survey technicians x 2	4 (2 x 2)
T-2 Geotechnical technician	1
T-3 AutoCAD technicians x 2	8 (2 x 4)
A-1 Office manager/accountant	5
A-2 Project secretary	5
Total	23

The consultant may wish to adjust staffing inputs to suit his work program and methodology.

A summary of the minimum qualifications and experience for each of the key professional position is given in Annex C.

2. Equipment and facilities

The consultant shall make provision in his bid for the following items:

- i. Domestic airfares and related costs
- ii. All costs related to accommodation and subsistence of staff
- iii. Travel in Orissa, vehicle hire, etc
- iv. Rental of suitable office accommodation in Orissa, maintenance and utilities
- v. Provision or hire of office furniture, computers, printers, etc
- vi. Office running costs (stationary, office consumables, clerks, cleaners, guards, etc)

- vii. Field staff costs (chainmen, labourers, etc)
- viii. Communications (telephone, courier, internet, etc) for the execution of the services only. Private telephone calls, etc, shall be the consultant's responsibility
- ix. Hire or procurement of field equipment, ie survey equipment, software, drilling machine, augers, etc.
- x. Printing and binding of reports and drawings.
- xi. Any other expenses for completion of the assignment.

D. Contract amount and payment schedule

In accordance with procurement under CQS (Consultant's Qualification Selection) the firm selected to submit a bid on the basis of the EOI submission shall submit a technical and financial proposal.

The financial proposal shall comprise a lump sum amount for the contract with supporting data to justify the amount based on proposed staffing and equipment and facilities costs.

The contract shall be lump-sum with the following staged payments.

	Payment Milestone	Percent payment
1	Advance payable on contract signing	10
2	Submission and approval of Inception Report	5
3	Submission and approval of Survey Reports	20
4	Submission and approval of Geotechnical Report	10
5	Submission and approval of Design Statement and Design Report for Main Canals	30
6	Submission and approval of Packaging Intent Report and Contract Documents	20
7	Submission and approval of Final Report	5
	Total	100

Distributaries of Kansbahal Canal System**Classification Criteria:****Main Canal: Q = More than 10 Cumecs****Distributary:Q = Between 1 to 10 Cumecs**

Sl.No.	Canal System as per existing Nomenclature	Offtaking R.D. In Km	Command Area (CCA) In Ha.	Designed Discharge of Canal in Cumecs as per approved D.S.	Length of Canal In Km	Identification as per Q & CCA Criteria
1	2	3	4	5	6	7
1	Left Main Canal	Kansbahal Reservoir	3650	3.70	23.424	Distributary
2	Right Main Canal	Kansbahal Reservoir	1080	1.10	5.820	Distributary
	Total		4730	4.80	29.244	

Note:

1. Survey and plotting of Longitudinal and cross sections have been undertaken through an Agency, M/s.Visiontek Consultancy Services Pvt.Ltd., Bhubaneswar for the entire canal canal system including two distributaries of 29.244 km (Left & Right).
2. The LS and CS for these distributaries shall be provided by the Executive Engineer in-charge.
The Consultant has to prepare the LS & DS and get approval from the Competent Authority.
3. Establishment of BM concrete pillars, survey for contour plan, CS & LS, Sub-soil investigation, soil testing, design for all new structures and structure need modification/alteration; preparation of estimates for earth work, structures, packaging & preparation of tender documents shall be within the scope of the present tender.

LIST OF STRUCTURES
In Distributaries of Kansbahal Canal System
Source: LS and DS prepared by this office on 12.10.2010

Sl. No.	Canal System	As per Inventory / Renovation / New (Reconstruction)									Total
		HR	VRB	Aqueduct	CS	DS	Escape	CR	Outlets	Measuring Device	
1	2	3	4	5	6	7	8	9	10	11	12
Right Distributary											
1	Inventory	8	6	1	3	12	0	0	12	0	42
	Renovation	5	3	0	1	1	0	0	6	0	16
	New	0	1	0	0	0	0	0	0	2	3
Left Distributary											
2	Inventory	14	30	4	5	24	1	0	39	0	117
	Renovation	13	15	3	2	9	0	0	33	0	75
	New	0	5	0	0	1	1	1	0	5	13
Total	Inventory	22	36	5	8	36	1	0	51	0	159
	Renovation	18	18	3	3	10	0	0	39	0	91
	New	0	6	0	0	1	1	1	0	7	16

All projects-structure lists.xls

ANNEX C: PROFESSIONAL CONSULTANTS QUALIFICATIONS AND EXPERIENCE

	Team Member	Indicative Qualifications	Experience Required
P-1	Team Leader/Project Manager	M Tech / ME	10 yrs experience in water resources engineering or related field 3 relevant project manager or deputy project manager assignments. Knowledge of computer based design and drawing production
P-2	Mapping / GIS Specialist / Senior Surveyor	Diploma	10 yrs experience in mapping and development of GIS related to survey. Minimum of 3 relevant assignments
P-3	Land Surveyors	Diploma	8 yrs experience in GPS and / or total station topographic surveys and the digital reducing and plotting of data. Minimum of 3 relevant assignments
P-4	Geotechnical Engineer	B Tech / BE / BSc	10 yrs experience in geotechnical investigations and interpretation of results. Minimum of 3 relevant assignments
P-5	Senior Irrigation Design Engineer	M Tech / ME	10 yrs experience in planning and design of large scale irrigation projects Minimum of 3 relevant assignments. Knowledge of computer based design and drawing production
P-6	Irrigation Design Engineers	B Tech / BE	5 yrs experience in the planning and design of large scale irrigation schemes. Minimum of 2 relevant assignments. Knowledge of computer based design and drawing production.
P-7	Structural Engineer	B Tech / BE	7 yrs experience in the detailed design of hydraulic structures Minimum of 3 relevant assignments
P-8	Junior / Sub-Assistant Engineers	Diploma	3 yrs experience in irrigation and water resources. Minimum of 2 relevant assignments
P-9	Procurement / Contract Specialist	M Tech, ME or similar	10 yrs experience in the bidding process for civil works, preferably with experience of donor funded procurement procedures Minimum of 3 relevant assignments

SECTION III

FORMAT FOR EOI SUBMISSION: (I) PROFILE; (II) PROJECT EXPERIENCE, (III) PERSONNEL; AND (IV) FINANCIAL STATEMENTS

This section comprises guidelines and format for submission of the Eoi, specifically:

Consultants Profile and Registration
Project Experience
Professional Personnel
Financial Statements

A. CONSULTANTS PROFILE AND REGISTRATION

The Consultants profile shall comprise a brief (max 4 pages for each firm / sub-consultant / partner) description of the background and organization of the firm and, if applicable, Sub-Consultant and each joint venture partner for this assignment. Specifically the profile(s) shall document:

- i *Name of the Firm/Consultant, year of establishment and registration, location of the headquarters office, correspondence address, telephone number and e-mail address.*
- ii *Professional Staff numbers.*
- iii *Firm/Consultant's registration status (registration legal documents to be attached). Registration with the National Remote Sensing Agency is an advantage.*
- iv *Certificates from the competent authorities for completed assignments.*
- v *Relevant factors relating to background and organization that focuses on handling projects similar to the proposed assignment. Of specific interest are: (i) innovative technologies/methods/equipment for surveys and designs; and (ii) quality control and back-stopping support arrangements for assignments.*

B. PROJECT EXPERIENCE

Using the format below, provide information on each assignment for which your firm, and each joint venture partner or sub-consultant for this assignment, was legally contracted either individually as a corporate entity or as one of the major companies within a joint venture or sub-consultancy, for carrying out consulting services similar to the one requested under this assignment. Use a maximum of 10 pages—generally not more than one page per project / assignment.

Assignment name:	Approx. value of the contract (in current INR):
Country: Location within country:	Duration of assignment (months):
Name of Client:	Total N ^o of person-months of the assignment:
Address, email and phone contacts:	Approx. value of the services provided by your firm under the contract (in current INR):

Start date (month/year): Completion date (month/year):	Nº of professional person-months provided by the joint venture partners or the Sub-Consultants:
Name of joint venture partner or sub-Consultants, if any:	Name of senior regular full-time employees of your firm involved and functions performed (indicate most significant profiles such as Project Director/Coordinator, Team Leader):
Narrative description of Project—in what ways similar to the current assignment:	
Description of actual services provided in the assignment in what ways similar to the current assignment:	

Consultant's Name: _____

C. CONSULTANT'S PROFESSIONAL PERSONNEL

Tabulated data are to be provided for each firm / firm / sub-consultant / partner) for their relevant full time professional staff that may be made available for the assignment. The required tabulated data are listed below:

- i *Survey / GIS / Mapping staff: names, date of birth, nationality, period with firm, qualifications, years of experience*
- ii *Design Staff: names, date of birth, nationality, period with firm, qualifications, years of experience*
- iii *Geotechnical staff: names, date of birth, nationality, period with firm, qualifications, years of experience*

D. FINANCIAL STATEMENTS

The Bidder and its parties shall provide the audited financial statements to reflect the financial situation of the bidder or partner to a JV. These financial statements shall provide the following information.

1. Total value of work performed in each of the last three financial years.

2008/09 _____

2009/10 _____

2010/11 _____

2. Work performed as prime contractor (in the same name) on works of a similar nature over the last three years.

Project Name	Name of Employer	Description of work	Value of contract (INR)	Commencement date	Stipulated period of completion	Actual date of completion	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

3. Existing commitments and on-going works:

Description of Work	Place	Contract No. & Date	Value of Contract (ETB)	Stipulated period of completion	Value of works remaining to be completed (ETB)	Anticipated date of completion
(1)	(2)	(3)	(4)	(5)	(6)	(7)

4. Information on litigation history in which the Bidder is involved.

Other party(ies)	Employer	Cause of dispute	Amount involved	Remarks showing present status
------------------	----------	------------------	-----------------	--------------------------------

SECTION IV

CRITERIA FOR EVALUATION OF EXPRESSIONS OF INTEREST

The submitted Eols will be checked, evaluated and compared as follows:

- i. Completeness and conformity to the requirements of the Eol without material deviation. In this regard the firm / joint venture shall also demonstrate: (a) legal registration status; (b) an annual average turnover of at least INR 2 million; and (c) participation in at least one contract similar in scope, nature and size within the last three years. Eols which are not complete or responsive shall be excluded from further consideration.
- ii. Technical evaluation of complete and responsive Eols shall be evaluated and ranked as shown below. The highest ranked consultant / joint venture will be invited to submit a technical and financial proposal.

Ref	Criteria	Points
1	Consultancy Profile	
	Certification with the National Remote Sensing Agency	5
	Use of innovative and appropriate technologies (GIS, CAD, etc) for similar assignments	10
	Quality control and back-stopping support arrangements for assignments	10
	Sub-total	25
2	Experience of the consultancy / joint venture	
2.1	Topographic survey	15
2.2	Geotechnical investigation	10
2.3	Detailed design	15
	Sub-total	40
3	Consultants professional staff qualifications and experience	
3.2	Survey / GIS / Mapping Staff	10
3.3	Irrigation / Hydraulic Design Staff	15
3.4	Geotechnical Staff	10
	Sub-total	35
	Total	100