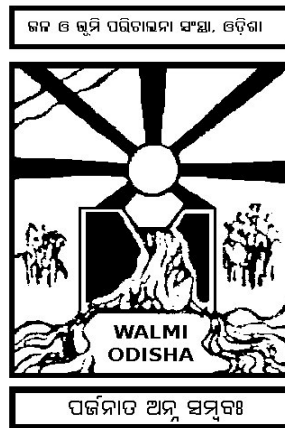


**EXPRESSION OF INTEREST (EOI)
WITH REQUEST FOR PROPOSAL (RFP)
FOR
RECRUITMENT OF FIRM/ CONSULTANT FOR
MICROPLANING SURVEY WITH FIXATION OF CHAK
BOUNDARIES OF MANJORE IRRIGATION PROJECT**



WATER AND LAND MANAGEMENT INSTITUTE

(A Premier training Institute under DOWR, Govt. Of Odisha)

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**EXPRESSION OF INTEREST (EOI) WITH REQUEST FOR PROPOSAL (RFP) FOR
RECRUITMENT OF FIRM/ CONSULTANT FOR MICROPLANING SURVEY WITH
FIXATION OF CHAK BOUNDARIES OF MANJORE IRRIGATION PROJECT**

CONTENTS

Sl.No.	Section	Description of contents	Page Number
1.	Section - I	Request for Expressions of Interest (Eol)	2
2.	Section - II	Information to the applicants	3
3.	Section - III	(a) Technical Proposal standard forms	4
		(b) Financial Proposal standard forms	12
4.	Section - IV	Terms of Reference	16
5.	Section - V	Special Terms & conditions	33

SECTION -I

REQUEST FOR EXPRESSION OF INTEREST

1. On behalf of Water And Land Management Institute, the Deputy Director, WALMI invites experienced and eligible national level Firm/ Consultant to submit their EoI applications.
2. The EoI documents are available in official website of WALMI, Odisha “www.walmiodisha.com” and can be downloaded from date 18.07.2016 to 01.08.2016 up to 3.00 PM.
3. The firm/ consultant has to deposit the cost of document i.e Rs.6,300/- (non-refundable) by Demand Draft/ BD to be drawn from any nationalized/ scheduled bank payable at Bhubaneswar or Cuttack in favour of Deputy Director, WALMI along with the Proposal.
4. The Firm/ Consultant has to deposit EMD of Rs.34,000/- (refundable) by DD/ BD drawn from any nationalised Bank in favour of Deputy Director, WALMI & payable at Bhubaneswar or Cuttack.
5. Interested Firms/ Consultants should provide full information about their experience/capacity relevant to this assignment supported by documentary proof describing their staff strength, administrative, financial management and coordination strength and experience in equivalent projects over the last three years using the following outline.
 - Consultant's/Firm's profile, in addition, evidence showing the good performance of the previously engaged works such as completion certificate and value of assignment.
 - Project experience demonstrating the requisite experience meeting the criteria;
 - Satisfactory completion of 2 irrigation projects covering minimum 6000 ha. command area in Major/ Medium Irrigation Project in the last three years,
 - innovative technologies and latest equipment, and
 - relevant ISO and/or professional certification
 - Key personnel available with immediate effect for the assignment
 - Financially sound to undertake the assignment, demonstrated by provision of audited balance sheets for the last three years
 - Registration with the National Remote Sensing Agency is preferred.

SECTION – II

INFORMATION TO THE APPLICANTS

1. Firm Details
 - (a) Name of the Firm/Consultant, year of establishment and registration, location of the headquarters office, correspondence address, telephone number and e-mail address;
 - (b) Number of years of experience; (clearly specifying experience in the irrigation field).
 - (c) Staff strength by category related to staffing requirements with signed formats attesting availability for the assignment with immediate effect shall be submitted with the EOI;
 - (d) Audited annual statement of income and expenditure / balance sheets for the last 3 (three) years;
 - (e) Firm/Consultant's registration legal documents; (Copy of Resolution for signing authority); and
 - (f) Experience in two irrigation projects in the last three years. Please provide the name(s) and detailed address(es) of the Project Authorities/ Agencies (Clients), including value of work executed with supporting documents in support of evidence. Work experience without supporting documents i.e. certificate from the competent authority for completing the assignment satisfactorily shall not be taken into consideration for evaluation. Reference may be contacted for verifications of executed works.
 - (g) Experience engaging systems users in participatory walk through to agreed location.
 - (h) As timing is the major factor for completion of the work, experience of the Firm/ Consultant in using innovative technologies/methods to complete the assignment shall be demonstrated and required.
 - i. Experience in using innovative technologies and latest equipment for surveys and designs shall be demonstrated;
 - ii. ISO or equivalent certification for quality purposes.
 - (i) Experience in designing works according to current Indian Standards and processing designs with the executing agency to obtain timely approvals from the competent authorities. Demonstrated by certificates/letters of completion from clients.
2. Any evidence showing the good performance of the previously engaged works such as completion certificate and positive evaluation by a third party would be encouraged.
3. The Consulting Firm/ Consultant will be selected and engaged under Consultant's Qualification Selection (COS) procedures in accordance with the guidelines. Selection of a Firm/ Consultant is on the basis of an EOI and a negotiated combined technical-financial proposal.
4. The technical proposal is methodology statement and work plan with detailed schedule to complete the work.
5. The sealed Expression of Interest from the eligible experienced and competent Firms/ Consultants are invited to submit at the address indicated below both in hard and soft (electronic-CD) copy latest by 01.08.2016 up to 3.00 P.M. The Eols received late through post will not be considered for opening (the Institute will not be responsible for any lapses or delays in postal delivery). The Expression of Interest so received in the Tender Boxes shall be opened on 01.08.2016 at 4:00 pm in the office of the undersigned in presence of the Firms/Consultants or their authorised representatives who wishes to attend. If the office happens to be closed on the last date of submission and opening of Expression of Interest (EOI) as mentioned above, the EOLs will be received and opened on the next working day at the same time and same venue.
6. The undersigned reserves the right to accept or reject any or all Eols or cancel the invitation of Eol without assigning any reason thereof.
7. Approximate estimated amount of the service is INR 3.43 Million without Service Tax.

8. Technical Proposal standard forms & Financial Proposal standard forms along with all supporting documents must be signed.
9. Bid validity period is sixty days from last date of submission of EoI proposal.

Deputy Director, WALMI
Pratapnagari, Cuttack, Odisha

SECTION III

A. Technical Proposal Standard forms

FORM TECH-1

LETTER OF PROPOSAL SUBMISSION

[Location, Date]

To:
The Director, WALMI,
Pratapangari, Telengapentha, Cuttack

Dear Sirs:

We, the undersigned, offer to provide the consulting Assignment/ job for [Insert title of Assignment/ job] in accordance with your EoI with Request for Proposal dated [Insert Date] and our Proposal. We are hereby submitting our Proposal, which includes this Technical Proposal, and a Financial Proposal sealed under a separate envelope and requisite EMD and bid processing fees.

We hereby declare that all the information and statements made in this Proposal are true and accept that any misinterpretation contained in it may lead to our disqualification.

We understand you are not bound to accept any Proposal you receive.

We remain,
Yours sincerely,

Authorized Signature [In full and initials]:

Name and Title of Signatory:

Name of Firm:

Address:

FORM TECH-2

CONSULTANT'S ORGANIZATION AND EXPERIENCE

A - Consultant's Organization

[Provide here a brief description of the background and organization of your firm for this Assignment/ job. The brief description should include ownership details, date and place of incorporation of the firm, objectives of the firm etc.]

B - Consultant's Experience

[Using the format below, provide information on each Assignment for which your firm, for carrying out consulting Assignment/ job similar to the ones requested under this Assignment (If possible, the employer shall specify exact assignment for which experience details may be submitted). (Furnish data for at least 2 relevant project in the state of Odisha)

1.	Firm's name:	
	Assignment/ job name:	
1.1	Description of Project	
1.2	Approx. value of the contract (in Rupees):	
1.3	Country:	
1.4	Location within country:	
1.5	Duration of Assignment/ job (months) :	
1.6	Name of Employer:	
1.7	Address:	
1.8	Total No of staff-months of the Assignment/ job:	
1.9	Approx. value of the Assignment/ job provided by your firm under the contract (in Rupees):	
1.10	Start date (month/ year):	
1.11	Completion date (month/ year):	
1.12	Name of associated Consultants, if any:	
1.13	No of professional staff-months provided by associated Consultants:	
1.14	Name of senior professional staff of your firm involved and functions performed.	
1.15	Description of actual Assignment/ job provided by your staff within the Assignment/ job: (Also provide No of farmers trained so far during last 3 years)	

Note : Please provide documentary evidence form the client i.e copy of work order, contract for each of above mentioned assignment. The experience shall not be considered for evaluation if such requisite support documents are not provided with the proposal.

Signature of the authorized Person
with seal

**DESCRIPTION OF APPROACH, METHODOLOGY AND
WORK PLAN FOR PERFORMING THE ASSIGNMENT/ JOB**

[Technical approach, methodology and work plan are key components of the Technical Proposal. You are suggested to present your Technical Proposal divided into the following three chapters: a) Technical Approach and Methodology, b) Work Plan, and c) Organization and Staffing]

a) Technical Approach and Methodology. In this chapter you should explain your understanding of the objectives of the Assignment/ job, approach to the Assignment/ job, methodology for carrying out the activities and obtaining the expected output, and the degree of detail of such output. You should highlight the problems being addressed and their importance, and explain the technical approach you would adopt to address them. You should also explain the methodologies you propose to adopt and highlight the compatibility of those methodologies with the proposed approach.

b) Work Plan. The consultant should propose and justify the main activities of the Assignment/ job, their content and duration, phasing and interrelations, milestones (including interim approvals by the Employer), and delivery dates of the reports. The proposed work plan should be consistent with the technical approach and methodology, showing understanding of the TOR and ability to translate them into a feasible working plan. A list of the final documents, including reports, drawings, and tables to be delivered as final output, should be included here. The work plan should be consistent with the Work Schedule of Form TECH-7.

c) Organization and Staffing. The consultant should propose and justify the structure and composition of your team. You should list the main disciplines of the Assignment/ job, the key expert responsible, and proposed technical and support staff.]

Signature of the authorized Person
with seal

FORM TECH-4

TEAM COMPOSITION AND TASK ASSIGNMENT/ JOBS

Staff Strength by category

Sr. No.	Name of Staff	Name of Firm	Area of Expertise	Position/ Task assigned for this job

Signature of the authorized Person
with seal

**CURRICULUM VITAE (CV) FOR PROPOSED
PROFESSIONAL STAFF**

1. Proposed Position:

[For each position of key professional separate form Tech-5 will be prepared]:

2. Name of Firm:

[Insert name of firm proposing the staff]:

3. Name of Staff:

[Insert full name]:

4. Date of Birth:

5. Nationality:

6. Education:

[Indicate college/ university and other specialized education of staff member, giving names of institutions, degrees obtained, and dates of obtainment]:

7. Membership of Professional Associations:

8. Other Training:

9. Countries of Work Experience:

[List countries where staff has worked in the last ten years]:

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

11. Employment Record:

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

From [Year]: To Year]:

Employer:

Positions held:

12. Detailed Tasks Assigned

[List all tasks to be performed under this Assignment/ job]

13. Work Undertaken that Best Illustrates Capability to Handle the Tasks Assigned

[Among the Assignment/ jobs in which the staff has been involved, indicate the following information for those Assignment/ jobs that best illustrate staff capability to handle the tasks listed under point 12.]

Name of Assignment/ job or project:

Year:

Location:

Employer:

Main project features:

Positions held:

Activities performed:

14. Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any willful misstatement described herein may lead to my disqualification or dismissal, if engaged.

Date:

Place:

[Signature of staff member or authorized representative of the staff]

[Full name of authorized representative]:

STAFFING SCHEDULE

SI No	Name of Staff	Staff input (in the form of a bar chart)						Total Months
		1	2	3	4	5	6	

Note:

1. For Professional Staff the input should be indicated individually; for Support Staff it should be indicated by category.
2. Months are counted from the start of the Assignment/ job. For each staff indicate separately staff input for home and field work.

Signature of the authorized Person
with seal

WORK SCHEDULE

Sl No	Activity	Months						Total Months
		1	2	3	4	5	6	

Note:

1. Indicate all main activities of the Assignment/ job, including delivery of reports and other benchmarks such as Employer approvals. For phased Assignment/ jobs indicate activities, delivery of reports, and benchmarks separately for each phase.
2. Duration of activities shall be indicated in the form of a bar chart.

Signature of the authorized Person
with seal

SECTION – III (B)

Form FIN1

FINANCIAL PROPOSAL SUBMISSION FORM

(Location, Date}

To: The Director, WALMI,
Pratapnagari, Teengapanth, Cuttack.

Dear Sirs:

We, the undersigned, offer to provide the consulting services for [Insert title of assignment] in accordance with your EoI with Request for Proposal dated [Insert Date] and our Technical Proposal.

Our attached Financial Proposal is for the amount of {Indicate the corresponding to the amount(s) currency(ies)} {Insert amount(s) in words and figures}, [Insert “including” or “excluding”] of all indirect local taxes

Our Financial Proposal shall be binding upon us subject to the modifications resulting from Contract negotiations, up to expiration of the validity period of the Proposal.

We understand you are not bound to accept any Proposal you receive.

We remain,

Yours sincerely,

Authorized Signature {In full and initials}:

Name and Title of Signatory:

In the capacity of:

Address :

E-mail:

SUMMARY OF COSTS

Item	Cost	Remark
	Amount (Rs.)	
Competitive Components		
Remuneration, Key Experts		
Remuneration Non-Key Experts		
Reimbursable Expenses		
Sub-Total		
Non-Competitive Components		
Provisional Sums		
Contingency		
Sub-Total		
Total Cost of the Financial Proposal ⁶		
Indirect Local Tax Estimates ⁷		
(i) {insert type of tax . e.g., VAT or sales tax}		
(ii){e.g., income tax on non-resident experts}		
(iii) {insert type of tax}		
Total Estimate for Indirect Local Tax:		

6. Should match the amount in Form FIN-1.

7. To be discussed and finalized at the negotiations if the Contract is awarded.

Signature of the authorized Person
with seal

FORM FIN3

BREAKDOWN OF REMUNERATION

No.	Name & Position	Person-month Remuneration Rate (Rs.)	Time Input in Person/ Month	Amount (Rs.)	Remark
1.	Key Experts				
2.	Non-Key Experts				

Signature of the authorized Person
with seal

FORM FIN4

**BREAKDOWN OF OTHER EXPENSES, PROVISIONAL SUMS
AND CONTINGENCY**

Type of Expenses, Provisional Sums and Contingency	Quantity	Unit	Unit Price (Rs.)	Amount (Rs.)	Remark
Reimbursable Expenses					
{ e.g., Per diem allowances }		Day			
{ e.g., Communication costs }		Trip			
{ e.g., reproduction of reports }					
{ e.g., Office rent }					
Sub-Total					
Provisional Sums					
Item 1					
Item 2					
Sub-Total					
Contingency					
Total: Reimbursable Expenses + Provisional Sums + Contingency					

Signature of the authorized Person
with seal

SECTION – IV

TERMS OF REFERENCE (ToR)

1. Scope of the work:

The Manjore Irrigation Project a Medium Project under Mahanadi Basin is to provide irrigation to about 5721 hectares of CCA in Athamallick Block of Angul District in the state of Odisha. The Project consists of two main Canals i.e. Right Main canal & Left Main canal. The Right Main canal comprises of about 958.62 ha. The Left Main Canal comprises of about 4762.38 ha. In order to provide equitable, timely & assured irrigation it is planned to create farmers awareness in the irrigated command on the mode of Participatory Irrigation Management (PIM). This will finally lead to transfer of tertiary irrigation networks to registered farmers organization (WUA) through Farmers Organization & Turn over along with micro network of field channels & field drains with 5-8 ha sub-chaks.

The work is to be completed within 6 (six) calendar months.

2. Aims & Objectives: Well defined planning and design of field channels and field drains should be verified in the field in consultation with the departmental engineers and the beneficiaries as follows.

- (a) To ensure stable, adequate and dependable water supply to the farmers.
- (b) To ensure equitable distribution of water to 5-8 ha of each sub-chak under each outlet.
- (c) To ensure that the system can serve as means to optimize the efficiency of irrigation.
- (d) To ensure that the system is acceptable to major portion of farmers and they are adequately involved to the system to consider it to be their own system.

Therefore design of outlets should be made after the micro system is decided whether it is 5 ha or 8 ha block as the field application losses should be minimized and optimum use of water is done at the field.

3. Offer Validity Period: The offer shall be valid for a period of not less than 90 days.

4. Price Escalation: Price escalation is not admissible in this contract.

6. Terms of Payment: Stage wise payment shall be made on satisfactory completion of each stage as detailed in clause 13 of Technical Specification.

TECHNICAL Specification

MICROPLANNING SURVEY WITH FIXATION OF CHAK BOUNDARIES OF MANJORE IRRIGATION PROJECT

1.0 Definitions:

The Work: Survey, Planning, & Design of Irrigation & drainage network for the ayacut area of about 6775 ha of Manjore Irrigation Canal System as per T.O.R. given in this document.

Main Canal: The Main Canal named Left Main Canal & Right Main Canal having a length of 10.774 Km & 5.88 Km respectively having capacity of about 7.30 cumecs & 1.202 cumecs respectively.

Branch Canal: 1 Branch Canal named Belpunji Branch Canal having a length of 6.229 Kms takes off from 2.30 Km of left Main Canal having discharge capacity of 1.601 cumecs.

Minors: A distribution channel of smaller size which takes off from the Main Canal or the Branch Canal to deliver water to chak outlets and has a capacity between 0.1 to 1.0 cumecs.

Sub-Minors: A comparatively smaller distribution channel <0.1 cumecs, which usually takes off from minors to deliver water to chak outlets away from the minors. In some cases sub-minors also takes off directly from other bigger channels depending on topography of the ayacut.

Micro-Irrigation System: Consists of CAD channel (Water Course and Field Channel) and structures which supply water to chaks and sub-chaks.

Water Course (WC): The channel in a chak taking off from a minor/ sub-minor to deliver water to sub-chak turnout is called Water Course. Its capacity is sufficient from head to tail to take full outlet discharge.

Field Channel (FC): Smaller channels in a chak between the turn out and leading from the watercourse to farm plots: capacity is sufficient to take full water course discharge from head to tail.

Minor Service Area (MSA): It is the basic unit in which the entire project command is sub divided for allocation of water and is confined to the limits of the command of one minor covering one or more than one village with its extents varying from 200 ha. to 500 ha. However, if a service area is crossed by a major drain or a railway line or a branch canal or a sub branch canal or a distributary area on either side the MSA will be limited. If large may be considered as independent MSA and, if small, should be clubbed with adjoining MSA.

Culturable Command Area (CCA): The area to be annually irrigated by any canal and established by the area as recorded in the Record of Right (ROR) documents maintained by Revenue authorities. This shall exclude areas above FSL which cannot be commanded and areas

under roads, - tanks, forest and homestead land, pasture, burial ground and fallow land minor irrigation project area etc.

Chak: A sub-division of MSA which gets irrigation from a single outlet of any channel is termed as Chak (Irrigation Block Boundary) and is usually less than 40 ha. in size.

Sub-Chak: Sub-Chak is a sub-division of a chak which is commanded from a single turnout. Usual size of sub- chak is 5-8 ha.

Proportionate Flow Divider/ Proportional Distributor: A structure provided to proportionately distribute flow in minor/ sub-minor. It will be provided at every chak head or at the off take of sub-minor/ minor.

Outlet (OL): Outlet is a vent of any size provided in the channel of any categories, depending on the area to be irrigated to let put water from the conveyance channel to a chak for providing irrigation. **The micro-distribution conveyance channel starts from outlet points.**

Sub Chak Turnout: Small structure for discharging water from water course to field channels with capacity equal to water course capacity. It is an in line ON/ OFF gated structure installed at the outlet to the sub-chak head.

Farm Turnout: It is an ON/ OFF gated structure at farm head.

Drainage System: For this contract Drainage system means the link/ collector drains from chak boundaries to the natural drains.

Link/ Collector Drain: It is the drain on the d/s of the chak which collects storm water from farm drains within a chak and carries it into the natural drains.

Farm Drain: Farm drains are graded channels that collect excess water from farms or holdings leading to link or collector drain. If the consultant feels that any of the definitions are not clear, or if meaning of any of the terms .• used in contract document is not clear to him, he shall immediately seek clarification from the concerned Executive Engineer/ Engineer-in-Charge of Manjore Irrigation Division.

2.0 Information and Instructions:

2.1 Scope of work: The scope of work under this assignment consists of the following operations with supply of all required equipment, personnel, materials and information system. These are to be executed as per the detailed instructions and specifications.

Stage-I

2.1.1 Preliminary data collection including collection of village (cadastral) maps from Project Authorities, ROR details from Project Office and recording the same in the computer media.

2.1.2 Verification and updation of Maps.

2.1.3 Fixation of the bench marks.

2.1.4 Ground Survey and plotting contours and other features like existing canals, roads, cart tracks etc. including natural drainage channels as per micro distribution works.

Stage —II

2.1.5 Preparation of chak and sub-chak planning and reconnaissance survey in the field for finalizing the alignment of water course through PWT.

2.1.6 Final alignment survey of micro irrigation and drainage system and preparation of **L.S. and D.S.**

Stage-III

2.1.7 Detailed typical design and drawing of structures on micro irrigation and drainage system.

Stage-IV

2.1.8 Preparation and submission of various reports, maps, plans, drawings and documents.

2.2 Brief Description of the System:

2.2.1 Culturable Command Area: 6775 ha.

2.2.2 Present Status of canal and Drainage Net Work:

Right distribution system is completed & left distribution system is having a balance of 11.06 Km to be completed.

2.3 Objective and aim of the assignment:

The main objective of the contract is to obtain optimum solution for providing an efficient micro distribution network system on digitized village map (DVM) consisting of water courses, field channels, field drains, and several other small structures for efficient and equitable distribution of irrigation water so as to avoid, to the extent possible, the imbalance distribution between the beneficiaries at the head reach and tail so as to provide fair share of irrigation water to the tail enders. Similarly the drainage network is to be planned for providing efficient drainage of irrigation and storm water from the command area involving the construction of several structures to prevent soil erosion and land and channel degradation.

Other relevant information: The command area as specified under Para 2.2.1 above is having different crop calendars. Availability of temporary accommodation for survey party is required. Tent accommodation is preferable. It is advisable to take care of this aspect for planning the survey programme and submit the offer accordingly.

2.4 Information and documents to be supplied by the project authority and other obligations:

The project authority shall supply following information on requisition of the consultant:

2.4.1 Survey of India map to the scale of 1:50000 (original is to be returned).

2.4.2 Design statement & L.S. (approved) of main canals, branches, distributaries, minors and sub minors up to the head of micro irrigation system.

2.4.3 List of bench marks established by the DOWR and SOI giving their locations and values.

2.5 Documents to be furnished by the Firm/ Consultant and other contractual obligations:

The Firm/ Consultant is required to prepare a report containing relevant details and drawings and additional plans and drawings.

3.1 Village map: The field survey is to be conducted with reference to and on the cadastral survey map i.e. village map of scale 1". 330 ft (16" = 1 mile). The village map serves as the base for preparing micro net work lay out plan.

3.2.1 Record of Rights (R.O.R): Permanent ownership record of the land maintained by the Revenue authority is to be produced by the Service Provider for preparation of the report on payment.

3.2.2 Procurement: The village maps and R.O.R are available with the local Revenue authorities either locally or at the office at Angul and are to be produced by the contracting agency at their own cost. The department however will render assistance in giving introductory reference to prove that the maps are required official purpose.

4.0 Verification. and updation of maps:

4.1 The offer shall carry out reconnaissance survey in the field to verify if the layout of canal system shown in the plan and position of OL tally with ground condition. Other important features like village and plot boundary. Agricultural plots, household plots, water bodies like tank, stream, nala etc, roads, cart tracks., electric line, commentary, Anganbadi, Gochar land, village forests etc. as shown and recorded in the village map and ROR are to be verified with the ground status.

4.2 The Important features listed in para 4.1 above are to be marked on the village map, if these are not shown on the village map as per actual.

5.0 Preparation of digital village maps and land information system:

5.1 . Digital Village maps (DVM):

After the village maps are procured from the Revenue Authority/ Project Authority and verified with ground condition, the same shall be digitized with the use of electronics scanner and restore to vector conservation software or manually by the use of electronic digitizer and stored in computer media, later to be used for survey, planning and designing of micro irrigation and drainage system. While digitizing following points are to be incorporated.

- a) Each plot with its ownership boundary in the verified village map is to be stored as one separate entry in the graphical data base.
- b) Coordinates of two diagonal corners of the plot (ref. Para 7.0) and one central point are to be recorded as attributes along with the plot number in standard DBMS format compatible with database .
- c) The accuracy of digitization shall be such that for any plot, deviation shall not be more than $\pm 5\%$ in area and $\pm 2\%$ in perimeter.
- d) The output of such digitization shall be in Auto Cad compatible format.

5.2 Land Information System (LIS):

i) After all individual verified village maps are digitized as per 5.1 the individual DVM of each minor service area (MSA) are joined together with the CAD software to form the Survey Number Mosaic (SNM), which is the graphic land information data base.

ii. A thematic Village Data Base (VDB) from ROR shall be created with the use of either suitable DBMS software compatible with CAD software used for preparing SNM or suitable GIS software. Following features of each plot shall be recorded in this VDB.

- a). Village Name
- b). Thana No.
- c) Plot No.
- d) Area.
- e) Type of Land
- f) Owner's Name

iii) Above SNM (Graphic) and VDB (Thematic) files shall be linked to form the Land information System (LIS) which can be later used for preparation of Digital Land Map (DLM) with the ground contours drawn digitally on it as detailed in para 7.4.

6.0 Establishment of the Bench Marks & Reference to other levels:

6.1 Availability of Bench Marks: Some permanent Bench Marks of Survey of India. are available in the command area. Temporary Bench Marks (TBM) are left at the head reach of each off taking channel up to sub-minor by the department. The Firms are to carry levels from these points for fixing bench marks for the survey works.

6.2 Fixing Temporary Bench Marks by Firms/ Consultant: Additional temporary bench marks (TBM) for convenience during field survey are to be established by the consultant. These TBMs are to be established by the double leveling and shall be located on permanent structures.

The permissible error shall not exceed

$E = + C K$ mm where $C = 6$ and $K =$ distance of leveling done in Km. $E =$ Error in mm.

6.3 Reference to other levels: Any other levels of existing BMs, bed levels of existing distribution systems which are supplied by the Engineer-in-Charge to the consultant shall be checked by the consultant during course of their ground survey with reference' to the PBMs. Any discrepancy noticed shall be immediately brought to the notice of Engineer-in-Charge and his decision communicated in writing shall be followed:

7.0 • Survey for contouring and Preparation of Digital Land Maps: (Village maps showing Contours and field details) Field survey shall be carried out by the consultant with the help of GeodoMetre (Total station) through its survey parties on the village maps by taking spot levels in each and every survey number at two, diagonal corners and at the centre of the field. The diagonal corner points chosen for adjacent survey numbers (plot) should be opposite. In case of small and fairly level plots one level at the centre may serve the purpose. The level readings shall be taken up to 5 second accuracy. These should be same as those digitized (pare 5.1 b).

7.1 Additional spot levels shall be taken on roads, nalas, drain, railways etc. The leveling staff/prism shall be placed in the field and not on the boundary bunds. It should represent the local topography. The levels of the highest point in the field shall also be marked. Additional spot levels shall be taken at points that appear abnormally higher or lower than the general elevations of the plot so that the ridge and valley lines can be marked and ascertained. For drawing valley lines the levels of the bottom of the nalla must be taken. The field maps shall be based on an average density of minimum 4 to 6 spot elevations per hectares. ‘,.. All kachha and pucca roads Ditches, wells, houses, railways lines, high tension lines, electric poles, telephone poles, miles, irrigation pipe lines, large trees, or lands, forest and other prominent features etc shall be shown on the map. Minor

Irrigation Project and tanks are to be carefully surveyed giving their in the FRL extreme area flooded contour. TBL and spillways elevation.

7.2 The leveling work shall commence from the permanent Bench Marks, whose value is known., The B.:M.s shall be constructed as per para 6.2. All the B.M.s shall be connected by double leveling with sufficient accuracy as specified in this document. Each day's work shall be closed on any One of the bench mark mentioned above and the accuracy of the day's work checked. The field levels shall get test checked by the Engineer-in-Charge or his representative concurrently.

7.3 After the spot level survey as indicated above is completed the reduced levels shall be transferred to the Village Data Base and marked on Digital Village Map (DVM) at two corners of each field and additional spot as taken using the digitized points/ coordinates (pare 5.1 b). Thereafter contours may be marked on DVM by interpolation at 20cm interval with the use either DTM software interactively. The decimal contours shall be marked in broken and the full meter contours shall be marked with continuous line.

7.4 Digital Land Map (DLM): The contour map shall be prepared for each MSA in joining the village map Care shall be taken to see that the levels and their horizontal co-ordinates are transferred to the partly completed LIS and topographic database completed. Then with the use of suitable DTM/ Customized soft wares (Quick — Surf, DCA's- DTM or Grapher etc.) the contours shall be drawn and the DLM completed. Where the area is large instead of one Digital Land Map there can be two or more maps be utilized while planning chaks and sub-chaks, finalizing the alignments of canal and drainage network and location and type of structure and ultimately for preparation of Irrigation Information System (IIS). These shall be brought to the notice of Engineer-in-Charge and jointly sorted out.

7.5 On completion of the above, the digital land maps and LIS shall be submitted along with a summary report on preliminaries and survey to the Engineer-in-Charge in five copies for approval. After the approval by the Engineer-in-Charge is communicated the consultant may proceed with alignment survey and planning of micro distribution and drainage system.

8.0 Planning of Micro Distribution and Drainage System and Alignment Survey:

8.1 Chak Planning: In the digital land map the MSA shall be divided in to chaks of about 40ha. of C.C.A. The boundary of chaks shall be so defined that at least on one side, there is a drainage line. The alignment of drains shall generally follow valley lines. If there is no existing drain, (valley line) suitable drains shall have to be proposed, so that drainage form the chak can be collected, in this drain and further lead to main drain natural or manmade. The drainage network shall be connected to a suitable outfall. The area of each chak has to be found out and its CCA calculated from. ROR copies obtained from revenue authorities. In case this planning' (chak level) has been completed by

the department and outlet are in position, the contractor shall verify the planning and location and design of the chaks and outlet and suggest any change required.

8.1.2 Sub chak planning: After dividing MSA into chaks of about 40ha., the chaks shall be subdivided in to sub-chaks of 5 to 8ha and holding numbering 10 to 15. While dividing chaks in to sub-chaks general slope of the ground and alignments of drains leading water to link drain at the end of the chak shall be kept in mind.

8.2.1 Water courses: Having marked sub-chaks and probable drainage lines, alignments of water courses. Off taking from the minor and sub-minors shall be marked to serve each of the sub-chaks. The water course and field canals shall be generally aligned along field boundaries, as far as practicable, so that not much cultivable land is wasted and land acquisition is minimal.

8.2.2 Field channels: Where the sub-chak area becomes more than 8ha. it may be necessary to plan a field channel along the minors ridge line of that sub-chak. Similar procedure and survey work has been described above for water courses & for aligning field channels. On these field channels, turnouts are to be provided at suitable location so that no turn-out has to serve more than 8ha. of C.C.A.

8.2.3 This exercise shall be carried out by the Firm/ Consultant in consultation with the Engineer-in-Charge. before taking up the reconnaissance survey.

8.2.4 Reconnaissance Survey: After fixing the alignment of water courses and field channels the Agency shall carry out reconnaissance survey in field to verify if the alignment of WC and FC to suit to the ground conditions and structures such as tube wells, wells house, etc. are not encountered along the alignment fixed. The locations of the turnouts at falls and crossing shall also be verified in the field of their suitability.

8.2.5 The Firm/ Consultant shall prepare the design statement L.S. of micro irrigation & drainage system from the DLM/ IIS (pars 8.3).

8.3 Irrigation Information System (IIS): This is a combined graphic thematic information which has got all the information of the land as well as those of the micro irrigation and drainage system. This is prepared by digitization of the layout of the micro-irrigation drainage system along with its all relevant features on DLM.

8.4 The Firm/ Consultant shall submit the above IIS showing the layout L.S. of water courses and field channels, link and collector drains including necessary structures along with a summary report on planning to the Engineer-in-Charge for approval.

9.0 Design of Micro Irrigation & Drainage System:

9.1 After receiving approval to the final layout and IIS the Firm/ Consultant shall proceed with the task of preparing final designs of WC and drainage channels, FC investigation for structures, detailed design of structures, fixing permanent bench marks along the alignment of micro distribution network.

The Firm/ Consultant shall prepare the detailed design of the following in accordance with the criteria laid down in Para 9.2.

- a. Design of Micro Irrigation System.
- b. Design of Drainage System.
- c. Design Statement.
- d. Detailed design of typical structures.

9.2 Parameters to be followed for design:

The parameters fixed in relevant IS code shall be normally followed. Some of those are given below for reference.

- a. The gradient of water course should be between 1 in 100 to 1 in 1000. The water courses should be parallel top ground profile as far as possible and alignment along the drains shall be avoided and the velocities are within permissible limits for strata met with. If the ground is steep falls, chutes etc. are to be provided: Falls are to be provided generally at locations where canal Bank level touches the ground. The F.S.L. has to be so kept, as to provide as far as possible at least a working head of 150mm over the highest field to be irrigated. The embankment height of water courses shall be slightly higher than the surrounding ground. The height of embankment shall not exceed 1.5M.
- b. Turn-outs are to be provided at the highest possible level in the field to be irrigated.
- c. Generally the field channels are to be designed for a discharge of 32 ltrs per second with bottom width of 0.30M, minimum FSD of 0.3M and side slope as per strata if unlined/ vertical if lined.
- d. Conveyance losses are to be calculated at 0.60 cumecs/ m/ sqm. of wetted perimeters as per I.S.17H5-1963.
- e. Over design factor: In the system design, capacities would be $\pm 5\%$ above the computed capacities to allow for inaccuracies in design and construction.
- f. Free board 0.15m to 0.30m.
- g. Velocity permitted Black cotton soil 0.5 m/ sec: Hard soil 1.0 m/ sec.
- h. Value of coefficient of rugosity 0.025 for unlined & 0.017 for lined

- i. Side slopes: Black cotton soil -2.5:1 for un lined & Hard soil 1.5:1 for lined
- j. Falls 0.3m, 0.45m., 0.9m. height So as to suit the ground condition.

No field drains need be provided inside the Chak/ Sub-Chak, link drains and main drains need proper attention while designing.

9.3 Design Statement & Longitudinal section of link collector drains:

After finalizing the alignment of water courses and field channels, the alignment of link and collector drains are to be carefully planned in the contour maps along the valley lines and survey . works taken to finalize their design statements and longitudinal sections.

These all are to be submitted to the Engineer-in-Charge for approval showing therein the position of all related structures. Under this proposal improvement to existing drain are also to be furnished.

In case of doubts these are to be clarified from the Engineer-in-Charge before proceeding with the work.

9.4 Stage-III —Report

The Firm/ Consultant shall submit the detailed design and drawings of micro irrigation and drainage system and necessary structures involving items of works vide para 2.1.8 and detailed in para 9.1 to 9.3 above with a design note to the Engineer-in-Charge in five copies for approval. The Engineer-in-Charge shall scrutinize the designs, drawings and the report and convey his observation to the Firm/ Consultant within two weeks of the submission of the report . The Firm/ Consultant shall promptly comply with the comments of the Engineer-in-Charge and incorporate the changes suggested by him in the final stage —Ill report and submit five copies to the Engineer-in- Charge for approval.

10.0 Report and Documentation:

On approval of Stage-III, the consultant shall submit the draft of the document of the work which shall comprise of in the following.

10.1A. Report and Drawings

Report Vol-I - Survey and Planning

Report Vol-II - Design Drawing

Report Vol-III - Drawings

10.1.1 The reports in volumes I and II above shall contain details of Survey, Planning and Design of the Work 'under the broad subheads given in para,10.1.2.and printed in laser printer Helvetica-10 size letter. This shall be submitted in 20copies (one printed in laser printer & 19 photo copie) in final shape after the draft report is approved by the Engineer-in-Charge.

10.1.2 . Introduction.

- (i). General description covering all aspects of design and layout of structures provided etc.
- (ii). Salient features
- (iii) Schematic diagram
- (iv) The command statements for Water courses and field channels with elevation of critical field in its command.
- (v) MSA wise, village wise C.C.A. details of chaks, sub-chaks.
- (vi) Sub-chak wise details of survey number (plot) wise owner's name type of land and its area as per ROR.
- (vii) Drainage planning and layout.
- (viii) List of permanent bench marks with their locations and values. In addition to above, the report shall contain the following
 - 1. Index map:
 - 2. Appendix (Abbreviations used)
 - 3. Design Note covering survey, planning & Design of Water Course, Field channel & Drainage.
 - 4. Network Diagram.
 - 5. Information, collected during Reconnaissance survey :-•
 - 6. D.S.
 - 7. L.S.
 - 8. Map showing Water course cum drainage network.

10.1.3 The drawings in Vol-III shall be in A3/ A4 size and shall contain drawings.

10.1.4. These are to be printed in laser printer or plotted in electronic plotter. (one copy) and photo copied (19 copies).

10.1.4 List of maps, plans and drawings:

1. Index map in A3 size showing thereon alignment of branch canal, distributaries, MSA boundaries, important roads, railways, major drains and village boundaries etc (in scale 1:50000) for additional plans and drawings para 10.2)
2. A contour map of MSAs (DLM) as detailed in para 7.4 in A3/ A4 size in legible from showing thereon village survey number (plot) boundaries, levels taken at field corners,, contours plotted at 20cm. Interval with all field details viz. Kachha and Pucca roads, ditches, wells, houses, railway lines, high tension line, Electronic poles, telephone poles and other important and prominent features (in scale 1:3960 — village maps for Additional plans and Drawings para 10.2).
3. A contour map of a MSAs (IIS) as detailed in para 8.3 in A3/ A4 size in legible from showing thereon alignments of minors and sub minors type and location of structures, FSLs at offtake and structure locations. Chak and sub-chak layout., alignment of drainage network and type and details of structure provided thereon, location of permanent bench marks, Kachha and Pucca roads, ditches, well, houses, railway lines, high tension line, electric poles, telephonic poles and all other important prominent features (in scale 1:3960 — village map for additional plans and - drawings —para 10.2)
4. Longitudinal sections of canal drainage network showing thereon hydraulic details; location and type structures etc trial pit details etc. Scale Horizontal in suitable scale Vertical to match with A3/ A4 size sheet (for additional plans and drawings para 10.2 Horizontal and vertical 1:100)
5. Detailed drawings of structures in suitable scale to be accommodated in A4 size (For Additional Plans and Drawings para 10.2 in case of .layout etc.' the scale can be 1: 100 and in case of details of components the scale can be 1:25)
6. Line diagram of canals and canal network MSA wise (In suitable scale for additional plans and designs) The text & drawing of the Vol. 1-1, II and III shall be stored in computer media (compact Disk) in Word star or Word perfect and AutoCAD compatible formats respectively and given to the Engineer-in-Charge along with the final prints of the report and drawing volumes (Vol-I, II & III). All the three (I,II& III) volumes in 20 copies shall be of A4 size and spiral bounded with laminated/ plastic coated hard covers.

10.2. - Additional Plans and Drawings:

In addition to the plans, maps and drawings submitted in the Drawings Vol.III along with the Reports in Vol-I & II, the consultant shall submit plans and \drawings as mentioned in para 10.1.4 (1 to 6) in scales as indicated against each within parenthesis. The additional drawings/ plans shall be in A1. size plotted on 50 micron thick lacquered polyester single Matte film with the help of electronic plotter, 5 copies of each in ammonia Prints on super fine paper shall be given to the Engineer-in-charge along with the original film as stated above.

10.3. Notes:

1. For reports in case where all the details can be accommodated in one volume there can be two or more sections but in such case care should be taken that complete details of an item is covered in one section.
2. Where map/ drawings/ L.S. can not be accommodated in one sheet (either A3/ A4 or A1 as the case may be) overlaps of 1cm on all sides shall be provided.
3. An uniform title block shall be provided, on the right side bottom corner as per the details to be given by the Engineer-in-Charge.
4. The Firm/ Consultant shall submit original tracings and field blocks and, return the documents furnished by the DOWR/ E.E, Manjore Irrigation Division.

10.4. Additional Points:

For any additional information, the Firm/ Consultant may contact the Engineer-in-Charge. Standardized notation will be supplied by E.E, Manjore Irrigation Division along with the format for drawings (dimensions, lettering, name plate etc.) Through design criteria have been supplied or referred to the consultant will be ultimately responsible for design of a workable and economic system. To achieve this the consultant may propose change in the specifications to the Engineer-in-Charge and adopt them after receiving approval. Any other details necessary may also be asked for. The Firm/ Consultant if asked, will have to justify both technical suitability and. economical validity of the design and layout details suggested by him. In case of failure to do so. Changes as suggested by the Engineer-in-Charge are to be accepted by the firm and proceed with the subsequent operation accordingly.

10.5. Addition/ Modification: Should circumstances arise which call for additions/ modifications in the design criteria, the DOWR intimate the additions/ modifications to the firm. These addition/ modifications will have to be taken into account in the works undertaken under the contract after they are intimated.

11.0 Schedule:

Period of completion of all work under the contract is supplied in General Condition shall strictly. adhered to. However the consultant is committed to undertake at least as much work as indicated in this document. The Engineer-in-Charge will have the right to check at any time the deployment of personnel and equipment and proportionate progress of work as provided. The Engineer-in-Charge

may impose penalties as per the clauses of the contract if the contractor fails to adhere to the provisions of the schedules.

12.0 Stages of Approval:

Stage-I On completion of survey and preparation of base maps involving items of works vide para 2.1.1 to 2.1.4 & detailed in para 3.0 to 7.0 in different phases.

Stage-II On completion of chak and sub- chak- planning and alignment of micro irrigation and drainage system "involving item of. works vide para 2.1.5 to 2:1.7 and detailed in paras 8.0. .

Stage-III On completion of detail design & drainages of micro irrigation and drainage system and necessary structures involving item of works vide para 2.1,5 to 2.1.8 and detailed in para 9.0.

Stage-IV. On submission of Draft Final Report, Drawings and maps as detailed in para 10.0.

For all stages, approval will be communicated by the Engineer-in-Charge within four weeks from the date of submission and receipt of clarification and/ or compliance if any.

13.0 Measurement of Payment:

Stage wise and MSA wise payment shall be made to the firm on completion of each stage of work for MSA of at least 200-300 ha. in total and approval of the same by the DOWR. The firm shall execute the work in a planned phased manner as per the programme of work schedule so as to complete different stages of work on MSA basis.

13.1 The details of interim payment shall be as follows:.

1st Interim Payment : 40% of the agreement value shall be released on completion of stage I work as detailed in para 12.0 and approval of the same by Engineer-in-Charge/ DOWR.

2nd Interim Payment : 20% of the agreement value shall be released on completion of stage II work as detailed in para 12.0 and approval of the same by Engineer-in-Charge/ DOWR.

3rd Interim Payment : 20% of the agreement value shall be released on completion of stage III work as detailed in para 12.0 and approval of the same by Engineer-in-Charge/ DOWR.

4th Interim Payment : 10% of the agreement value shall be released on completion of stage IV work and draft final report as detailed in para 10.0 and approval of the same by Engineer-in- Charge/ DOWR.

Final Payment : 10% of the agreement value shall be released on submission of final reports, drawings and additional plans and drawings approved by Officer in charge as detailed in para 10.

14. Personnel & Equipment

14.1 The Firm/ Consultant will have a Project Manger or authorized representative assigned to the works, who shall be at site on daily basis.

14.2 The Firm/ Consultant will have latest equipment for survey and designs

14.3 Qualification of Key Team members

STAFFING SCHEDULE

Sl. No.	Staff Position	Qualification & Experience	No.	Indicative input (months)	Total staff - month
1.	Team Leader/ Project Manger	Graduate in Civil Engineering with 7 years relevant experience in design of major Water Resources Projects including design of Canal system.	1	6	6
2.	Sr. Surveyor	Diploma in Civil Engineering with 10 years survey experience in Mapping and GIS.	1	4	4
3.	Land Surveyor	Diploma in Civil Engineering with 5 years survey experience in GPS/ Total Station and digital reducing and plotting of data.	4	4	16
4.	Auto-Cad Technician	Diploma in Computer with 3 years Auto-Cad experience.	1	4	4
5.	Office Assistant	Graduate with 3 years Office experience.	1	6	6

SECTION – V

SPECIAL TERMS & CONDITIONS

- 1) The Firm/ Consultant shall carry out the work in accordance with the highest standard of professional and technical competency and integrity, having due regard to the nature and purpose of the assignment and to ensure that the staff assigned to perform the services under this agreement will conduct themselves in a manner consistent here with.
- 2) The Firm/ Consultant shall indemnify the WALMI against any and all claims and/ or demands of any nature brought against the Institute arising out of the services by the consultant under this agreement during the pendency of the contract.
- 3) All knowledge and information not within the public domain which may be acquire during the course of carrying out this agreement shall be for all time and for all purposes be treated as strictly confidential by the firm and their employees shall not be directly or indirectly disclosed to any person whatsoever except with the written permission of “The WALMI/ client”.
- 4) If, after the date of this contract, there is any change in the Applicable Law with respect to taxes and duties which increases or decreases the cost of services rendered by the Firm/ Consultant, then the remuneration and reimbursable expenses otherwise payable to the Firm/ Consultant under the Contract shall be increased or decreased accordingly by agreement between the Parties and corresponding adjustments shall be made.
- 5) The work shall be carried out by the consultant as per the latest guide lines codified for the work.
- 6) The Consultant shall be fully responsible for the accuracy of conducting survey at site, preparation of maps, analysis, design, drawings and reports submitted by them irrespective of the fact whether the same has been examined and accepted by the employer/ client or not.
- 7) The client on request of the consultant may arrange to coordinate other government departments for obtaining specific information/ data/ views/ maps and reports in connection with the Project. The associate consultant will pursue client’s correspondence till the desired objective made available.
- 8) The consultant is required to obtain necessary information, data, maps, and reports etc. from client to carry out the work after thorough examination.
- 9) The consultant is required to attend meeting at various levels for clearance of the work & also to comply any suggestions/ comments made for the work.
- 10) The consultant will submit required number of hard copies and soft copies of the documents/ reports prepared by them pertaining to the work.
- 11) The contract price and rates will be inclusive of all taxes and other duties etc. except service tax as applicable and the contract price will remain firm and fixed during the consultancy

period. No extra payment on account of price escalation will be payable to the associated consultant.

- 12) The contract price will be inclusive of all ancillary works necessary for carrying out the proposed work. No extra payments will be made to the consultant for the ancillary works/jobs.
- 13) The price of the consultant will be inclusive of all revision and modification works as when required.
- 14) The consultant will be fully responsible for the safety of the work, property and workmen. The consultant will provide proper insurance cover for the work and property against any damage due to natural calamities or otherwise from the date of commencement till the end of work and also insurance cover against possible accidents and personal injuries to workers and workmen etc. during the period of work.
- 15) The consultant should thoroughly inspect the worksite, and appraise himself about the working conditions, scope and nature of work, activities required to be carried out at site for completion of work and the difficulties involved in the work before submitting the proposal. The consultant neither will raise any claim on account of this or any other information not being available with him at the time of submitting proposal nor such claims will be entertained by the Institute.

Signature of the authorized Person
with seal