



**GOVERNMENT OF THE INDEPENDENT STATE OF
SAMOA**

NATIONAL TENDERS BOARD

**MINISTRY WOMEN, COMMUNITY AND
SOCIAL DEVELOPMENT**

**PROCUREMENT OF DETAILED DESIGN AND
SUPERVISION ASSISTANCE FOR REHABILITATION/
UPGRADE OF SIX INDEPENDENT WATER SCHEMES**

REQUEST FOR QUOTATION

RFQ Reference: MWCSO/2010/01

OCTOBER, 2010

Letter of Invitation

Dear Sirs,

1. Request for Quotations

The Ministry of Women, Community and Social Development (MWCSO), hereinafter the Procuring Entity, intends to apply State budget funds for the Procurement of detailed design and supervision assistance for rehabilitation/ upgrade of six independent water schemes.

2. This RFQ includes the following submission documents:

Letter of Invitation
Technical Proposal - Standard Forms
Financial Quotation - Standard Forms
Terms of Reference

3. Eligibility of Consultants

Consultants must meet the following general eligibility requirements:

- (a) possess a valid business license;
- (b) be free from insolvency, bankruptcy, or similar status;
- (c) have legal capacity to enter into contract;
- (d) have an adequate record of business integrity and ethics;
- (e) not be excluded pursuant to Part IX of the "Guidelines for Government Procurement and Contracting: Consulting Services" available from www.mof.gov.ws; and
- (f) the firm and its principals have not been convicted within the last year of, or currently under indictment for, a criminal offence involving corruption or other misconduct reflecting a lack of suitability to participate in procurement.

4. Preparation and Submission of Quotations

The Technical Proposal shall be placed in a sealed envelope clearly marked “Technical Proposal” followed by the RFQ Number and the name of the assignment, as indicated above in the present letter. Similarly, the Financial Proposal shall be placed in a sealed envelope clearly marked “Financial Quotation” followed by the RFQ Number and the name of the assignment as indicated above in the present letter and with a warning “Do Not Open With the Technical Proposal.”

The envelopes containing, respectively, the Technical Proposal and the Financial Quotation shall be placed into an outer envelope and sealed. This outer envelope shall bear the submission address, RFQ number, name of the assignment, submission deadline and offer validity, and be clearly marked “Do Not Open, except during the proposal opening session.”

The Procuring Entity shall not be responsible for misplacement, losing or premature opening if the outer envelope is not sealed and/or marked as stipulated. This circumstance may cause the rejection of the quotation. If the Financial Quotation is not submitted in a separate sealed envelope duly marked as indicated above, this will constitute grounds for rejecting the Proposal. **The Technical Proposal shall not include any financial information which may totally or partially disclose the offered proposal price.** A Technical Proposal containing such financial information shall be rejected.

5. Technical Proposal

You should provide your Technical Proposal in accordance with Annex 1 “Technical Proposal - Standard Forms”

6. Financial Quotation

You should also provide a Financial Quotation. Please find below in Annex 2 “Financial Quotation - Standard Forms”. **Please note that the maximum budget available for this assignment is SAT 380,000**

7. Terms of Reference

The services should be provided in accordance with the Terms of Reference contained in Annex 3 below.

8. Requests for Clarifications and Information meeting

At the discretion of the Evaluation Committee, requests for clarifications may be sent to the bidders in writing by The Procuring Entity. Such clarifications shall only concern minor elements of the Proposals and in no way can allow for substantial changes to the initial Proposal. Answers shall also be provided only in writing.

There will be an information meeting for this tender opportunity at 10am on Tuesday 9th November at the Internal Affairs Office, Ministry of Women, Community and Social Development. Attendance at this information meeting is strongly encouraged but is not a requirement for submission of an offer.

9. Evaluation Procedure

a) Evaluation of Technical Proposals

The evaluation committee shall evaluate the Technical Proposals on the basis of their compliance with the requirements of the TOR, relevant experience of the firm, experience and qualifications of proposed personnel, methodology, work plan, organization, knowledge of local or specific conditions, as applicable. Each acceptable Proposal will be given a technical score (**St**). A Proposal shall be rejected at this stage if it fails to achieve the minimum technical score of 70 points.

Proposals will be evaluated in accordance to the following criteria:

| | |
|---|-----|
| Experience of tenderer in undertaking similar assignments | 15 |
| Approach, methodology and work plan for performing the assignment | 20 |
| Qualifications and experience of proposed team: | |
| Design: Qualifications and experience in detailed design of gravity water supply systems and similar infrastructure | 25 |
| Site supervision: experience in supervision of construction works with community participation/labour contribution | 20 |
| Technical supervision capacity: technical capacity in managing / supervising gravity water supply systems | 20 |
| | 100 |

The minimum technical score S_t required to pass to the evaluation of the financial quotation is: 70 points

b) Evaluation of the Financial Quotation

The lowest price will be noted 100 points. The formula for determining the financial score S_f is the following:

$$S_f = 100 \times P_i/P_m, \text{ where}$$

S_f is the point given to the quotation
 P_i is the lowest price
 P_m is the price of the evaluated quotation

c) Global evaluation of the Quotation

The technical proposal is given a weight of 75% and the financial quotation 25%. The global score is determined as follows: $S = 75\% S_t + 25\% S_f$

Where:

- S is the global score
- S_t is the score of the technical proposal
- S_f is the score of the financial proposal

The quotation achieving the highest combined technical and financial score will be selected.

10. Date for Submission

You are requested to provide your quotation the latest by 1pm on Monday 29th November at the address indicated below:

**Secretary to Tender's Board
 4th Floor, Central Bank Building,
 Beach Road**

**Ministry of Finance,
Private bag
Apia, Samoa.**

11. Validity of Quotation

The quotation shall remain valid for a period not less than 60 days after the deadline date specified for submission.

12. Please note that the cost of preparing a Quotation and of negotiating a contract is not reimbursable as a direct cost of the assignment.

13. If you require further information on the assignment and the local conditions, you may contact the Water Sector Principal Programme Officer (Internal Affairs Division) of the Ministry of Women Community and Social Development: **Ms. Laumua Leavai-Duseigneur** at the following phone number and address:

Tel: 29958, 23698 or 7260025
Email: mleavai@yahoo.com
Internal Affairs Division, Beach Road, Apia

14. The Client is not bound to accept any of the quotations submitted.

15. Please inform us, upon receipt:
(a) that you received the letter of invitation; and
(b) whether or not you will be submitting a quotation.

We look forward to receiving your quotation and thank you for your interest in this project.

Name: MINISTRY OF WOMEN COMMUNITY AND SOCIAL DEVELOPMENT
Address: PRIVATE BAG APIA, SAMOA
Tel. No. 29958
Email address: mleavai@yahoo.com

Yours sincerely,

Chief Executive Officer
Ministry of Women, Community and Social Development

DATA SHEET

| | |
|--|--|
| Deadline for submission of RFQ | 1pm on Monday 29 th November 2010 |
| Period of validity of Proposal | 14 th January, 2011 |
| Latest commencement date for the assignment | 30 January, 2011 |
| Timeframe for design phase | 6 weeks |
| Timeframe for construction phase | 5 months |
| Timeframe for warranty phase | 6 months |
| Facilities to be provided by the procurement entity | None |
| Counterpart staff to be provided by the procurement entity | IWSA and the IWS programme officer in MWCS D will work closely with the consultant. An MoU will be signed detailing the role of the different stakeholders for implementation of the rehabilitation upgrade works including the leading role of the local community in managing/construction of all pipeworks. A technical project committee will be established under the chair of MWCS D to facilitate the consultants work. This committee will include representation from IWSA, MWCS D, and WSCU and will meet at least every two weeks |
| Information to be provided by the procurement entity | Copies of the conceptual designs for all the schemes |

Annex 1

Technical Proposal – Standard Forms

- TECH-1 Technical Proposal Submission Form
- TECH-2 Consultant's Organization and Experience
 - A Consultant's Organization
 - B Consultant's Experience
- TECH-3 Comments or Suggestions on the Terms of Reference and on Counterpart Staff and Facilities to be provided by The Procuring Agent
 - A On the Terms of Reference
 - B On the Counterpart Staff and Facilities
- TECH-4 Description of the Approach, Methodology and Work Plan for Performing the Assignment
- TECH-5 Team Composition and Task Assignments
- TECH-6 Curriculum Vitae (CV) for Proposed Professional Staff
- TECH-7 Staff Schedule
- TECH-8 Work Schedule

FORM TECH-1 TECHNICAL PROPOSAL SUBMISSION FORM

(Location, Date)

To: ___(Name and address of (Procuring Entity))

Dear Sir or Madam:

We, the undersigned, offer to provide the consulting services for ___(Insert title of assignment) in accordance with your Request for Quotations 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.

We are submitting our Proposal in association with:___ (Insert a list with full name and address of each associated Consultant or insert 'none')

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.

If negotiations are held during the period of validity of the Proposal, as indicated in the Data Sheet, we undertake to negotiate on the basis of the proposed staff. Our Proposal is binding upon us and subject to the modifications resulting from Contract negotiations.

We undertake, if our Proposal is accepted, to initiate the consulting services related to the assignment not later than the date indicated in the Data Sheet.

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 (two pages maximum) description of the background and organization of your firm/entity and each associate for this assignment.)

B - Consultant's Experience

(Using the format below, provide information on a maximum of 5 assignments for which your firm, and each associate for this assignment, was legally contracted either individually as a corporate entity or as one of the major companies within an association, for carrying out consulting services similar to the ones requested under this assignment. Use a maximum of 10 pages.)

| | |
|--|---|
| Assignment name: | Approx. value of the contract (in Samoan Tala as applicable): |
| Country: Location within country: | Duration of assignment (months): |
| Name of Client: | Total N ^o of staff-months of the assignment: |
| Address: | Approx. value of the services provided by your firm under the contract (in current Samoan Tala): |
| Start date (month/year): Completion date (month/year): | N ^o of professional staff-months provided by associated Consultants: |
| Name of associated Consultants, if any: | Name of senior professional staff of your firm involved and functions performed (indicate most significant profiles such as Project Director/Coordinator, Team Leader): |
| Narrative description of Project: | |
| Description of actual services provided by your staff within the assignment: | |

Firm's Name: _____

**FORM TECH-3 COMMENTS AND SUGGESTIONS ON THE TERMS OF
REFERENCE AND ON COUNTERPART STAFF AND FACILITIES TO BE PROVIDED
BY THE PROCURING ENTITY**

(These shall not be used for evaluation purpose, but may be discussed during negotiations. The Procuring Entity is not bound to accept any modifications proposed. If the proposed modifications/suggestions would require changes in the offered price, it should be noted as such, without giving the price of the change. Disclosure of any prices in this Form shall be reason for rejection of the Proposal.)

A - On the Terms of Reference

(Present and justify here any modifications or improvement to the Terms of Reference you are proposing to improve performance in carrying out the assignment (such as deleting some activity you consider unnecessary, or adding another, or proposing a different phasing of the activities). Such suggestions should be concise and to the point, and incorporated in your Proposal).

B - On Counterpart Staff and Facilities

(Comment here on counterpart staff and facilities to be provided by the Procuring Entity according to information in the Data Sheet)

FORM TECH-4 DESCRIPTION OF APPROACH, METHODOLOGY AND WORK PLAN FOR PERFORMING THE ASSIGNMENT

(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,*

Consultants are encouraged to respond directly to the TORs. Comments to the TORs may be provided in Form TECH 3.

a) Technical Approach and Methodology. In this chapter you should explain your understanding of the objectives of the assignment, approach to the services, methodology for carrying out the activities, including transfer of knowledge, 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. In this chapter you should propose the main activities of the assignment, their content and duration, phasing and interrelations, milestones (including interim approvals by the Procuring Entity), 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-8.

c) Organization and Staffing. In this chapter you should propose the structure and composition of your team. You should list the main disciplines of the assignment, the key expert responsible, and proposed technical and support staff.)

FORM TECH-6 CURRICULUM VITAE (CV) FOR PROPOSED PROFESSIONAL STAFF¹

1. Proposed Position (only one candidate shall be nominated for each position): _____

2. Name of Firm (Insert name of firm proposing the staff): _____

3. Name of Staff (Insert full name): _____

4. Date of Birth: _____ **Nationality:** _____

5. Education (Indicate college/university and other specialized education of staff member, giving names of institutions, degrees obtained, and dates of obtainment): _____

6. Membership of Professional Associations: _____

7. Other Training (Indicate significant training since degrees under 5 - Education were obtained): _____

8. Countries of Work Experience: (List countries where staff has worked in the last ten years): _____

9. Languages (For each language indicate proficiency: good, fair, or poor in speaking, reading, and writing): _____

10. Employment Record (Starting with present position, list in reverse order every employment held by staff member since graduation, giving for each employment (see

¹ The CVs are not required to follow this format but they must include **all the information** that is in the standard format.

format here below): dates of employment, name of employing organization, positions held.):

From (Year): _____ To (Year): _____

Employer: _____

Positions held: _____

| | |
|--|--|
| <p>11. Detailed Tasks Assigned</p> <p><i>(List all tasks to be performed under this assignment)</i></p> <p>12. Work Undertaken that Best Illustrates Capability to Handle the Tasks Assigned</p> <p><i>(Among the assignments in which the staff has been involved, indicate the following information for those assignments that best illustrate staff capability to handle the tasks listed under point 11.)</i></p> | <p>Name of assignment or project: _____</p> <p>Year: _____</p> <p>Location: _____</p> <p>Client: _____</p> <p>Main project features: _____</p> <p>Positions held: _____</p> <p>Activities performed: _____</p> |
|--|--|

13. 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 wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

(Signature of staff member or authorized representative of the staff) Date: _____

Day/Month/Year

Full name of authorized representative: _____

FORM TECH-7 STAFF SCHEDULE¹

| N° | Name of Staff | Staff input (in the form of a bar chart) ² | | | | | | | | | | | | | Total staff-month input | | | | |
|----------------|---------------|---|---|---|---|---|---|---|---|---|----|----|----|---|-------------------------|--------------------|-------|--|--|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | n | Home | Field ³ | Total | | |
| Foreign | | | | | | | | | | | | | | | | | | | |
| 1 | | (Home) | | | | | | | | | | | | | | | | | |
| | | (Field) | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | |
| n | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | Subtotal | | | | |
| Local | | | | | | | | | | | | | | | | | | | |
| 1 | | (Home) | | | | | | | | | | | | | | | | | |
| | | (Field) | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | |
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|---|--|--|--|--|--|--|--|--|--|--|--|--|-----------------|--|--|--|--|--|
| n | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | Subtotal | | | | | |
| | | | | | | | | | | | | | Total | | | | | |

- 1 For Professional Staff the input should be indicated individually; for Support Staff it should be indicated by category (e.g.: draftsmen, clerical staff, etc.).
- 2 Months are counted from the start of the assignment. For each staff indicate separately staff input for home and field work.
- 3 Field work means work carried out at a place other than the Consultant's home office.

 Full time input
 Part time input

Annex 2
Financial Quotation – Standard forms

- FIN-1 Financial Quotation Submission Form
- FIN-2 Summary of Prices
- FIN-3 Breakdown of expenses by Activity

FORM FIN-1 FINANCIAL QUOTATION SUBMISSION FORM

(Location, Date)

To: ___ (Name and address of (Procuring Entity))

Dear Sirs:

We, the undersigned, offer to provide the consulting services for ___ (Insert title of assignment) in accordance with your Request for Quotation dated ___ (Insert Date) and our Technical Proposal. Our attached Financial Quotation is for the sum of ___ (Insert amount(s) in words and figures¹).

Our Financial Quotation shall be binding upon us subject to the modifications resulting from Contract negotiations, up to expiration of the validity period of the Quotation, as indicated in the Data Sheet.

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: _____

- 1 Amounts must coincide with the ones indicated under Total Price of Financial Quotation in Form FIN-2.

FORM FIN-2 SUMMARY OF PRICES

| Item | Prices |
|--|-----------------------------|
| | <i>Total in Samoan Tala</i> |
| Total Prices of Financial Quotation ¹ | |

- 1 Indicate the total prices, to be paid by the Procuring Agent in Samoan Tala. Such total prices must coincide with the sum of the relevant Subtotals indicated in all Forms FIN-3 provided with the Quotation.

FORM FIN-3 BREAKDOWN OF EXPENSES BY ACTIVITY

Breakdown of price offer for IWS Design and Supervision

| | Qty | Unit rate | working day | Total |
|--|-----|-----------|-------------|-------|
| Phase 1: Design and tendering | | | | |
| Design Engineer | 1 | | 20 | |
| CAD Drawings/ Junior engineer | 1 | | 20 | |
| Incidental expenses | | | lump sum | |
| Phase 2: Supervision and construction of pipework | | | | |
| Supervising engineer | 1 | | 50 | |
| Site Foreman (pipelaying) | 6 | | 35 | |
| Trench digger /Rock breaker | 3 | | 45 | |
| Incidental expenses | | | lump sum | |
| Phase 3: Defects liability period | | | | |
| Supervising Engineer | 1 | | 18 | |
| Local transport | 1 | | lump sum | |
| Total | | | | |

ANNEX 3: Terms of Reference

1. Rehabilitation/Upgrade of Independent Water Schemes (IWS) 2010-2011

Terms of Reference:

Detailed Designs of Key Structural Elements to Four IWS, and Supervision of Works for the Upgrade of Six IWS

Background: In 2009, support to the Independent Water Schemes Association (IWSA) was provided by the EU Water Sector Support Programme (WASSP) to undertake the technical review of selected schemes so as to design priority areas for investment for the upgrade of their systems. Five schemes which demonstrated progress in improved governance were selected to receive funding to implement the first stage of improvements identified in the technical reviews. These works began in late-2009 and were completed by September 2010.

During the first half of 2010, the IWSA moved to undertake the technical review of a further six schemes in the second stage of water supply system upgrades. Based on the successful completion of training and demonstrated progress in the principles promoted by the IWSA, the six village schemes included in this second stage of improvements are Solosolo, Falelatai, Sataoa, Lotofaga, Falevao and Lalomauga.

Technical reports, including conceptual designs, have been completed for all 6 schemes and village consultations presenting these findings have also recently been undertaken. While there is sufficient detail in these conceptual designs for the basic scheme layout and pipe laying (which will be undertaken by the village members), there are a number of key structural elements (eg. intakes, tanks, etc) that require more detailed designs. Four schemes require these detailed designs in order to tender for construction.

Purpose: To provide (1) detailed designs of key structural elements to 4 IWS; and (2) supervision assistance for the rehabilitation and upgrade of 6 IWS.

Detailed tasks:

Phase 1: Preparation of Works Tender

1. Preparation of tender dossier for the structural components of rehabilitation upgrade of IWS excluding pipe works which will be implemented by the local community. A summary of the components that will be included in this tender is as follows:

| Detailed Drawings | Solosolo | Falevao | Falelatai | Sataoa | Lotofaga | TOTAL |
|--------------------|----------|---------|-----------|--------|----------|-------|
| Intake upgrade | | 1 | 1 | 1 | 1 | 4 |
| New intake | | 1 | 2 | 2 | | 5 |
| Sedimentation Tank | | 1 | | | | 1 |
| Tank upgrade | | | 2 | | 1 | 3 |
| BPT Standard Dwg | 1 | | | | | 3 |
| Storage tank SD | | | 1 | 1 | 1 | 3 |

This work will include the development of detailed designs with technical specifications and CAD drawings for the following:

- Upgrades to water supply intakes at four schemes (Falevao, Falelatai, Sataoa and Lotofaga).
 - Five new intake structures at Falevao (1), Falelatai (2) and Sataoa (2).
 - A new sedimentation tank at Falevao.
 - Upgrades to storage tanks at Falelatai (2) and Lotofaga (1)
 - The standard drawings of break pressure tanks and the new storage tanks will be provided to the consultant by MWCS D
2. To undertake this work the design engineer will be expected to visit the sites and arrange clearance with support from the local community. The designs developed must be suited to the specific requirements with each site with measurement of key elements. The consultant should make reference to the Manual on Gravity Fed Water Schemes (from Sri Lanka), which will be made available from IWSA to the selected contractor. The design of the intake works at Aufaga IWS may also be considered as an example of best practice. The tender dossier must be based on the standard Government template for works tenders.

Phase 2: Supervision of works.

3. The consultant will be required to supervise the construction of works by both the contractor for the civil works components and the local community for the pipe laying and to ensure the successful interconnection between these two components. Prior to the commencement of the construction works an MoU will be signed between the local water committee for each scheme, the Supervisor, IWSA and MWCS D. This document will set out the agreed roles and responsibilities of each partner in the project. The detailed requirements for this phase are as follows:
4. The provision of a full-time foreman at each of the six sites to advise and assist the local community in the preparation of trenches and the laying and connecting of pipes for the upgrade. All the materials, equipment and tools required for the pipe laying work will be procured and provided by the project to the local water committee. The water committee will be responsible for safe storage and monitoring the use of these materials, equipment etc. The standards to be followed for the pipe laying as attached. Standard drawings will be provided for the following construction components: trenches, stream crossings, anchor blocks, tapping saddles, pressure testing, SV chambers, AV chambers and tapping saddles. The foreman will be responsible for providing training and support to the local community to ensure the quality of the pipe laying to conform to the attached standards.
5. The provision of an overall supervising engineer to act as the supervisor's representative in managing and ensuring the technical quality of the works including both the civil works components and the pipe laying by the local community. The supervising engineer will be required to make regular visits to the sites to check the quality of the civil works against the standards set in the contract and to check and approve payments against the BoQ. Visits are expected to be weekly during the active period of construction with the timing of visits adjusted according to the stages of the work being undertaken. The supervising engineer will also be responsible for advising on variations or changes to the contract and ensuring that the contractor meets all his/her obligations. He will ensure clear written

communication in to the contractor on all contract matters. Any use of the contingency or adjustments to the BoQ will require the endorsement of the Supervising Authority, the Ministry of Women, Community and Social Development. The supervising engineer will be responsible for undertaking the final checks and preparing the provisional acceptance certificate, which will also be endorsed by the Supervising Authority. The Engineer will liaise with the local Water Committee and take their views into account in the management of the project. The consultant will provide monthly reports on progress of the rehabilitation works at each of the sites. The consultant will provide all the necessary tools and equipment for the supervising engineer to undertake his work and measurements of the contractor's performance.

6. The consultant will arrange to provide or sub-contract the necessary trench digging and rock breaking machinery to assist with the pipe laying works by the local community. The consultant will be fully responsible for the provision of these services and coordination of the use of the machinery at the various sites. The indicative number of working days required for this equipment is indicated in the financial offer format. In order to allow work to continue simultaneously at the different sites it is proposed to provide at least 3 trench excavation machines.
7. In his approach to the supervision of the works the consultant will be required to work in close collaboration with the local water committee and those responsible for the maintenance of the IWS to develop their skills in supervision and maintenance works including an understanding of the importance of standards and workmanship, especially for the implementation of household connections with tapping saddles.
8. During the construction implementation period the consultant will provide brief weekly updates on the progress of the report (1-2 page summaries of progress highlighting any problems or constraints). In addition the consultant will provide more comprehensive monthly reports on the progress of the works.

Phase 3: Defect liability period

9. The consultant will provide services during a six months defects liability period. During this period the consultant may be required to advise on problems with the schemes and any defects to be dealt with by the contractor. He may also be required to advise on improvements to the design/layout of the scheme to ensure optimum performance is achieved for the upgraded systems. The consultant will be responsible for undertaking a final check on the performance of the civil works prior to drafting and signing a Final Acceptance Certificate, which will trigger the release of the retention amount.

Estimate of working days for IWS Design and Supervision

| | Qty | working day | Total |
|--|-----|-------------|------------|
| Phase 1: Design and tendering | | | |
| Design Engineer | 1 | 20 | 20 |
| CAD Drawings/ Junior engineer | 1 | 20 | 20 |
| Phase 2: Supervision and construction of pipework | | | |
| Supervising engineer | 1 | 50 | 50 |
| Site Foreman (pipelaying) | 6 | 35 | 210 |
| Trench digger /Rock breaker | 3 | 45 | 135 |
| Phase 3: Defects liability period | | | |
| Supervising Engineer | 1 | 18 | 18 |
| Total | | | 453 |

Estimated timeframes for design and implementation of rehabilitation works by IWS

| Scheme | Civil Works Design | | | Pipe laying | | Civil Works Construction | | |
|--------------|--------------------|----------|-----------|--------------|------------|--------------------------|----------|------------|
| | Individual | Standard | Days reqd | Pipe length | Days reqd | Individual | Standard | Days reqd |
| Solosolo | 0 | 1 | 0 | 4270 | 21 | 0 | 1 | 5 |
| Lalomauga | 0 | 0 | 0 | 3330 | 17 | 0 | 0 | 0 |
| Falevao | 3 | 0 | 8 | 3250 | 16 | 2 | 0 | 30 |
| Sataoa | 3 | 2 | 8 | 7040 | 35 | 3 | 1 | 50 |
| Lotofaga | 2 | 2 | 6 | 3440 | 17 | 2 | 1 | 35 |
| Falelatai | 5 | 1 | 12 | 4790 | 24 | 5 | 0 | 75 |
| TOTAL | 13 | 6 | 34 | 26120 | 131 | 12 | 3 | 195 |

Budgeted:

| | | | |
|-------------------|----|-----|--------------------|
| Design engineer | 20 | 135 | with machinery |
| CAD technician | 20 | 75 | without machinery |
| Total design days | 40 | 210 | total foreman days |

The following assumptions have been made in the calculation of the estimated number of working days for the upgrade works:

- civil works design requires two days per individually-designed structure, plus an additional two days at each IWS for a site visit and general checks;
- pipe laying with the digger/rock breaker will proceed at an average of 200m pipe length per day;
- the site foreman will be required for one working week before the pipe-laying machinery arrives and 1.5 working weeks after it leaves;
- civil works construction requires 3 weeks for non-standard structures (intakes, tank upgrades) and 5 days for standard structures (BPTs, new storage tanks).

Attachment 1: Technical Specifications for Construction of Pipelines & Ancillary Works

1 General

- 1.1 This Specification covers all pipework, including pumping mains and supply pipelines.
- 1.2 The planning of the works shall keep disruptions to any existing utility services to a absolute and practical minimum during the course of his work.
- 1.3 The Principal undertakes to carry out the sterilisation of the new or old submains prior to commissioning of the supply mains for general public use.
- 1.4 The consultant with the labour provided by the local community undertakes to complete all works in accordance with the following process:
 - i. Install all Works in accordance with Design Drawings and Specifications.
 - ii. Conduct acceptance testing.
 - iii. Connect the mains.
 - iv. Charge and commission the new mains.

2 Levels and Alignment of Works

- 2.1 For water supply pipelines, the work shall be carried out in strict accordance with the positions, levels and alignments shown on the plans or directed by the Supervising Engineer and shall not be varied without the prior consent of the Contracting Authority.
- 2.3 Pipes wherever possible shall be laid in straight lines. It certain locations, where approved by the Supervising Engineer, pipes may be laid in slow bends with the deflection at each joint not exceeding 10 degrees from the straight. The Contractor shall increase the width of trench excavation to enable each joint to be correctly made in the straight condition and after jointing to be deflected to the required degree of curve. All bends shall be provided with concrete thrust blocks.
- 2.4 The Consultant shall use an approved method or instrument for maintaining line and grade.
- 2.5 The alignment of the pipelines shall be determined by the Supervising Engineer, where specific direction is not given on the drawings.

3 Pipe Bedding and Surround

- 3.1 Bedding for pipes shall be constructed by spreading and compacting 100mm of granular bedding material over the full width of the pipe trench. After the pipes have been laid, additional material shall be placed and compacted equally on each side of the pipes for the full trench width to 150mm above the top of the pipe, this shall be done in sequence with the removal of any trench supports.
- 3.2 On no account shall stones or other hard material be used below or against the pipes to locate them in position in the trench.

4 **Trench Backfilling**

- 4.1 Backfilling of pipe trenches shall be carried out using granular bedding material as pipe surround. Surround material to be placed to a minimum of 150 mm above the top of the pipe before placing selected excavated material above, in layers of not more than 300mm depth before compaction. Each layer shall be thoroughly consolidated to achieve a minimum of 92% of maximum dry density at optimum moisture content using the New Zealand Standard Compaction Test.
- 4.2 Selected excavated material may comprise granular or other material arising from excavation works, if approved by the Supervising Engineer. The Supervising Engineer will order that any material which he considers to be unsuitable shall not be used to refill the trenches and this material shall be removed from the site.
- 4.3 Tipping, shovelling or dropping the material from a height or refilling the trench in such a manner as the Supervising Engineer considers might damage the pipes or their covering shall be prohibited.
- 4.4 Sufficient space shall be left to receive the soil or other materials removed from the surface, allowance being made for subsequent settling, and the surface shall be restored by replacing the materials in their proper order and form. Where rock is exposed at ground level, the top of backfilling shall be protected against erosion by a layer of stones from the excavation.
- 4.5 Surplus materials from trench excavation shall be removed to a disposal area to be provided by the Contractor as soon as reasonable practicable after the refilling of trenches.
- 4.6 Where shown on the drawings or ordered by the Supervising Engineer, the labourers shall cover in with banking any pipes wholly or partly above the level of the ground or where the standard cover to the pipes is reduced in shallow trench work. Before proceeding with the banking, the surface soil shall be stripped and laid aside. The banking shall first be formed to a level to permit bedding as if in rock, with approved hard material well built and blinded with fine granular material. After thorough consolidation of the hard material and preparation of the pipe bed, the pipes shall be laid true to line and level and the banking over the pipes completed with approved granular material dressed off to an approved profile, soiled to a depth of 150 mm.

5 **Pipelaying Generally**

- 5.1 Where socketed pipes are required to be laid on a granular or sand bed, joint and sling position holes shall be formed in the bedding material to ensure that each pipe is uniformly supported throughout the length of its barrel, to enable the joint to be made, and to allow the free withdrawal of the sling without risk of damage to pipe external coatings.
- 5.2 No protective cap, disc or other seal on the end of a pipe or fitting shall be removed until the pipe or fitting that it protects is about to be jointed. Pipes and fittings, including any lining or sheathing, shall be examined for damage and the joint surfaces and components shall be cleaned immediately before laying.

- 5.3 Suitable measures shall be taken to prevent soil or other material from entering pipes, and to anchor each pipe to prevent flotation or other movement before the Works are complete.
- 5.4 When laying pipes, the open ends shall be sealed by a protective cap, disc or other appliance to prevent entry of extraneous matter.
- 5.5 Each pipe, valve or fitting shall be carefully lifted and lowered into the trench separately with suitable pipe slings, adequately protected by padding to ensure that the coating is not damaged. (Lifting hooks that pass into the socket and/or spigot end of each pipe will on no account be permitted, neither shall pipes be moved or handled by crowbar levered against the outside face or inserted into the body of the pipe).
- 5.6 Excavation and the preparation of the trench bottom and bed shall not exceed 100m in advance of the pipe laying operations.
- 5.7 Before a pipe is lowered into the trench, it shall be thoroughly examined to ensure that it is undamaged. Where necessary the interiors of pipes, specials and fittings shall be carefully brushed to remove any earth or other loose matter which may have been allowed to enter.
- 5.8 Minor deflections of a pipeline may be achieved by cumulative deflections at the joint of elastomeric ring seal jointed pipes. Flexible pipes may be deflected by controlled bending along the length of the pipe with limits of deflection specified by the pipe manufacturer.

6 Concrete Protection to Pipes

- 6.1 Concrete provided as a protection to pipes shall be Grade C20, placed to the required depth in one operation.
- 6.2 Where pipes with flexible joints are used, concrete protection shall be interrupted over its full cross-section at each pipe joint by a approved shaped compressible filler.
- 6.3 Rapid hardening cement shall not be used in concrete for the protection of plastic pipe.
- 6.4 Plastic pipes shall be wrapped with a layer of approved plastic sheeting before being surrounded by concrete.

7 Surface Boxes

- 7.1 Valve chambers shall be constructed as detailed in the contract drawings and in such a manner as to protect the pipe from impact where it passes through the wall. Care shall be taken to ensure that the base does not bear on the pipe or valve.
- 7.2 Valves surface boxes shall be firmly bedded in concrete and accurately positioned. When finished the top surface shall protrude 13 mm above the top of the final surface except in roads when it shall be flush with surface and lie parallel

to the plane of the surrounding surface. Rectangular valve surface boxes shall be laid so that the long side of the lid is parallel to the line of the main.

- 7.3 Surrounds shall be placed and constructed in such a way that no traffic load on the surface can be transferred directly through the surrounds or chamber on to any pipe or fitting. Under no circumstances shall the lowest precast unit bear on the valve or pipe.
- 7.4 Where a valve, toby or other surface box is, with approval, located in a concrete surface (footway, etc), the concrete surface shall be boxed to 150 mm larger than the surface box. Consolidated concrete shall be used to secure the surface box.
- 7.5 Surface boxes shall be thoroughly wire brushed to remove all scale and dirt and be painted with two coats of road paint (valves white and hydrants yellow) after one priming coat.

8 Anchor Blocks

- 8.1 Except where self anchoring joints are used, thrusts from bends, tees, crosses, valves, hydrants and caps shall be resisted by concrete anchor blocks cast in contact with undisturbed ground.
- 8.2 Any additional excavation required to accommodate anchor blocks shall be carried out after the fitting is in position and the thrust face shall be trimmed back to remove all loose or weathered material immediately prior to concreting.
- 8.3 The blocks shall consist of ordinary grade concrete, and shall be in accordance with the drawings or otherwise to the Supervising Engineer's instruction, to prevent overloading the pipe, fitting or ground.
- 8.4 Anchor blocks shall be allowed to develop adequate strength before any internal pressure is applied to the pipeline.
- 8.5 Where pipes are laid on a grade steeper than 1 in 3 they shall be securely anchored by means of high grade concrete blocks to prevent movement down the slope.
- 8.6 Concrete blocks shall be placed so as not to interfere with pipe joints and to leave them accessible for repair.

9 Trench Breakers

- 9.1 Trench breakers shall be installed in the positions directed by the Supervisor's Representative. They shall be formed from mass concrete 250 mm thick, keyed 0.2 m in natural ground at sides of trench, and 0.1 m base.
- 9.2 Where sand bedding is used, the distance from underside of pipe to base of trench breaker shall be 0.2 m. The top of the trench breaker shall be at 0.2 m below finished surface level.

10 **Indicators**

- 10.1 The position of surface boxes shall be marked by means of specified indicator posts set vertically within 225 mm of the boundary, immediately opposite the fixture concerned and bedded firmly in the ground to a depth of at least 1/3 of their overall height.
- 10.2 The line of the pipelines shall be marked by means of specified posts set vertically on boundary lines as directed by the Supervising Engineer and bedded firmly in the ground to a depth of at least 1/3 of their overall depth.

11 **Flanged Joints**

- 11.1 Flanged joints shall be correctly aligned before any bolts are tightened.
- 11.2 Jointing compounds shall not be used when making flanged joints. Bolt threads shall be treated with graphite paste and the nuts tightened evenly in diametrically opposite pairs.

12 **Cutting Pipes**

- 12.1 Pipes shall be cut by a method which provides a clean square profile, without splitting or fracturing the pipe wall, and which causes minimal damage to any protective coating. Where necessary, the cut ends of pipes shall be formed to the tapers and chamfers suitable for the type of joint to be used and any protective coatings shall be made good, and the ends sealed.
- 12.2 Where ductile pipes are to be cut to form non-standard lengths, the Contractor shall comply with the manufacturer's recommendations in respect of ovality correction and tolerances to the cut spigot end.

13 **Precast Concrete Manholes**

- 13.1 Precast concrete chamber and shaft sections shall be constructed with bolt on step irons in accurate alignment.
- 13.2 Joints shall be made so that the required jointing material fills the joint cavity. Any surplus jointing material extruded inside the chamber or shaft shall be trimmed off and joints shall be pointed on completion.

14 **Watertightness of Manholes and Chambers**

Manholes and chambers shall be substantially watertight, with no identifiable flow of water penetrating the Permanent Works.

15 **Inverts and Benching**

Inverts and benching shall be formed in Grade C20 in-suit concrete with a Steel Trowel or Fair Worked Finish as instructed by the Supervisor's Representative.

16 **Tolerances for Built-in Pipes**

Pipes built into the structures shall be installed to a tolerance of + 3 mm in a vertical or horizontal direction. In addition, to ensure that the flange bolt holes are in correct alignment, the tolerance on angular position shall be + 1 degree.

17 **Hydraulic Testing**

17.1 Pipelines shall be tested hydraulically in sections in a progressive manner during the course of construction. The testing shall be applied to prove the structural soundness of the various units in the line including pipes, valves, and anchorages and to prove the watertightness of the line.

17.2 All parts of pipelines up to the last possible point before the junction with existing pipelines or entry to structures shall be subjected to the test after the last item of work which may affect the pipeline has been completed.

17.3 Testing shall be applied initially to sections of pipeline not exceeding 2000 metres in length. In the event of repeated failures and at the Supervising Engineer's discretion, test lengths shall be reduced to 500m.

17.4 Initial tests shall be carried out with pipeline joints exposed wherever practicable. Subsequent tests, at the Supervising Engineer's discretion may be made with the trench backfilled. This will not apply to pipes with concrete bed, haunch or surround.

17.5 When the pipeline has been charged with water, the Contractor shall ensure that air has been completely removed that valves are in working order and that the stuffing boxes of valves are watertight. Particular attention shall be paid to sealed off branches.

17.6 A test pressure of 1.5 times the normal static head on the main or the Manufacturer's test pressure, whichever is the lesser, shall be applied over the test length and maintained at this pressure for 3 hours. Thereafter, the pump shall be disconnected and at the expiry of a period of 24 hours the quantity of water consumed in restoring the original test pressure shall be measured.

17.7 The quantity of water consumed shall not exceed 20 litres per 100mm diameter of pipe per 1000 metres length over the period of 24 hours.

17.8 Care must be taken not to exceed the test pressure at any point on the pipeline by sitting the pressure gauge at a known level on the pipeline and by making a suitable correction.

17.9 The plans to utilise some existing submains, to limit the expenditure outlay by the Client. Under the supervision/direction of the Engineer's Representative the out additional Pressure Testing may be carried out on some of these lines.

Any section of pipeline that fails the pressure test will be replaced and the test redone, any additional sections that fail in this additional test will also be replaced, the test will continue until the existing pipeline is able to withstand 1.5 times the operating pressure.

ATTACHEMENT 2: CONCEPTUAL DESIGNS FOR IWS SCHEMES